

*Everything's possible.*

# CANopen<sup>®</sup> Communication

Reference Manual

FlexPro<sup>®</sup> Servo Drives

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# Preface

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*ADVANCED* Motion Controls constantly strives to improve all of its products. We review the information in this document regularly and we welcome any suggestions for improvement. We reserve the right to modify equipment and documentation without prior notice.

For the most recent software, the latest revisions of this manual, and copies of compliance and declarations of conformity, visit the company's website at [www.a-m-c.com](http://www.a-m-c.com). Otherwise, contact the company directly at:

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## Agency Compliances

The company holds original documents for the following:

- UL/IEC 61800-5-1, file number E140173
- Electromagnetic Compatibility, EMC Directive - 2014/30/EU  
EN61000-6-2:2005  
EN61000-6-4:2007/A1:2011
- Electrical Safety, Low Voltage Directive - 2014/35/EU  
EN 60204-1:2019
- Reduction of Hazardous Substances (RoHS III), 2015/863/EU

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## Related Documentation

- Product datasheet specific for your drive, available for download at [www.a-m-c.com](http://www.a-m-c.com).

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## Attention Symbols

The following symbols are used throughout this document to draw attention to important operating information, special instructions, and cautionary warnings. The section below outlines the overall directive of each symbol and what type of information the accompanying text is relaying.



Note

Note - Pertinent information that clarifies a process, operation, or ease-of-use preparations regarding the product.



Notice

Notice - Required instruction necessary to ensure successful completion of a task or procedure.



Caution

Caution - Instructs and directs you to avoid damaging equipment.



Warning

Warning - Instructs and directs you to avoid harming yourself.



DANGER

Danger - Presents information you must heed to avoid serious injury or death.

## Revision History

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| Document ID | Revision # | Date    | Changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MNCMCNFP-01 | 1.0        | 2/2020  | First Draft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| MNCMCNFP-02 | 2.0        | 10/2021 | Updated scaling factors and conversion units in Appendix A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| MNCMCNFP-03 | 3.0        | 2/2023  | <p>Removed the following sub-indexes from section 2.4 Drive Configurations: 2032h, 2032.02h - 2032.09h, 2034.08h, 2034.09h, 2034.0Ah - 2034.0Ch</p> <p>Removed the following sub-indexes from section 2037h Velocity Limits: 2037.06h, 2037.07h</p> <p>Removed the following sub-indexes from section 2039h Position Limits: 2039.09h, 2039.0Ah, 2039.0Bh</p> <p>Removed section 200Bh Stored User Parameters</p> <p>Removed the following sub-indexes from section 2043h Capture Configuration Parameters: 2043.01h - 2043.09h, 2043.0Ah - 2043.0Ch</p> <p>Removed the following sub-indexes from section 205Ch: Analog Output Parameters: 205C.01h - 205C.09h</p> <p>Removed section 208Dh Firmware Information</p> <p>Removed section 2010h Current Values</p> <p>Removed <math>K_f</math> from Table A.2 Drive dependent conversion constants</p> <p>Added section 1010h: Store All Parameters</p> <p>Added section 1011h: Restore All Parameters</p> <p>Added section 2021h: Drive Operating Temperature</p> <p>Added sub-indexes to 2023h</p> <p>Removed section 2024h</p> <p>Added sub-indexes to 202Fh</p> <p>Added section 203Bh: Biquad Configuration Parameters</p> <p>Added section 2069h: Event History Reset Values</p> <p>Added section 2051h: Drive PWM and Servo Period</p> <p>Removed section 2019h</p> <p>Removed section 2043h</p> <p>Added section 2052h: Capture Configuration Parameters</p> <p>Added section 2053h: Capture Values</p> <p>Added section 2090h: Firmware Information</p> <p>Added section 20C2h: Dynamic Current Target Values</p> <p>Added sub-index 20CA.10h: Dynamic Index Confirmation Code</p> <p>Added section 20F1h: High Speed Capture Control</p> <p>Added sections 60B8h - 60D8h: Touch Probe Functions</p> <p>Added section 60FDh: Digital Inputs</p> <p>Added section 60FEh: Digital Outputs</p> <p>Added sub-indexes to 2035h: Current Loop Control Parameters</p> <p>Added Drive Signal Enum information to the Appendix</p> <p>Shifted sub-indices in 2064h: Event Response Time</p> <p>Shifted sub-indices in 2039h: Position Limits</p> <p>Added object 2200h: File Transfer System</p> |
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|-------------|-----|--------|---------------------------------------------------------------------|
| MNCMCNFP-05 | 4.1 | 4/2023 | Added ACE Shared Storage info to object 2200h: File Transfer System |
|-------------|-----|--------|---------------------------------------------------------------------|

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| MNCMCNFP-07 | 4.3   | 2/2024 | Added section 2010h Current Values to Object Dictionary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| MNCMCNFP-07 | 4.3.1 | 4/2024 | Updated Section 20D8h: Power Board Values in Object Dictionary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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## 2 Object Dictionary

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## Index I



# Communication Manual

## 1.1 Introduction

### 1.1.1 Purpose of this manual

This manual will provide all information necessary to communicate with and operate *ADVANCED* Motion Controls' CANopen drives. Further information regarding the physical CAN layer and CANopen protocol is attainable through the DS402 and DS301 documentation.

The CAN interface for *ADVANCED* Motion Controls' digital drives follows the CiA DS301 communications profile and the CiA DS402 device profile (device profile for drives and motion control). CiA (CAN in Automation) is the non-profit organization that governs the CANopen standard. They can be contacted at <http://www.can-cia.org>.

CANopen is an open standard embedded machine control protocol. CAN is a serial communication interface. The CANopen protocol is developed for the CAN physical layer. In this document, CAN is reserved for physical layer descriptions, while CANopen refers to the communication protocol.

### 1.1.2 Differences between this manual and DS301 & DS402

This manual provides all information necessary to properly communicate with the drive via the CANopen interface. The DS301 and DS402 documents are complimentary and can be used if more detailed information is required on specific standard CANopen features.



## 1.2 CANopen Objects

Every AMC CANopen drive function is defined by groups of objects. An object is roughly equivalent to a memory location that holds a value. The values stored in the drive's objects are used to perform the drive functions (current loop, velocity loop, position loop, I/O functions).

The drive has a unique object for every parameter that needs to be stored or used. Access to the objects varies depending on what the object is used for. Objects may be writable, readable, or both. Some objects are state dependant such that they may only be written to if the drive is in a certain state (e.g. disabled state). The list of objects that AMC CANopen servo drives use is found in the [“Object Dictionary” on page 70](#). Each table in the object dictionary describes the important information regarding that object including: object index, sub-indices, units, and accessibility.

Each object is accessible with a 16-bit address called the object index. Some objects contain sub components with 8-bit addresses called sub-indices. Reading and writing to objects is accomplished via CANopen Messages. Specific types of messages are designed to access specific objects. Details about CANopen message types are found in [“CANopen Messages” on page 5](#).

### 1.2.1 Types of CANopen Objects

There are 3 main object categories:

**Communication Objects 1000h – 1FFFh** These objects relate to CANopen communication; more specifically, they relate to objects defined by the DS301 communication profile. Objects in this range are used to configure CANopen messages (see [“CANopen Message Structure” on page 3](#)) and general CANopen network settings (e.g. network watchdog).

**Manufacturer Specific Objects 2000h – 5FFFh** These objects are manufacturer specific. Detailed information about the AMC manufacturer specific objects can be found in the [“Object Dictionary” on page 70](#).

**Standard Servo Drive Objects 6000h – 9FFFh** These objects are the standardized device profile objects. Objects in this range relate to the device profile of the CANopen device. The applicable device profile for AMC CANopen drives is DS402 (CANopen profile for servo drives). Other device profiles exist also, but they are not discussed here; examples include: DS401 (CANopen profile for I/O modules), and DS405 (CANopen profile for PLC). Detailed information about AMC supported DS402 objects can be found in the [“Object Dictionary” on page 70](#).

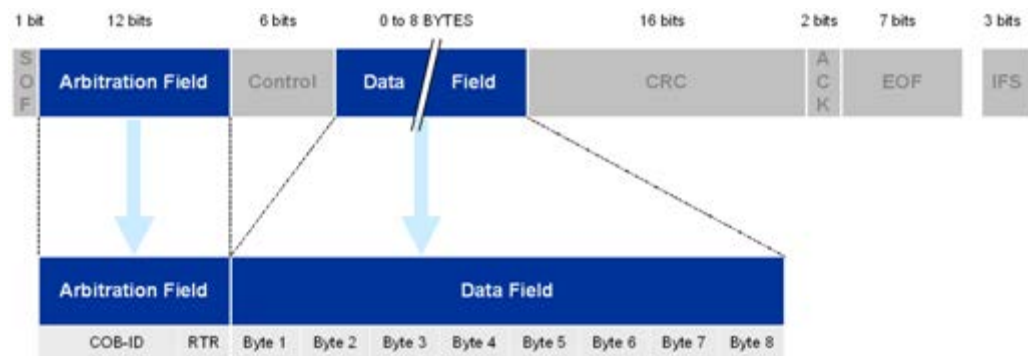
### 1.2.2 CANopen Object Data

Every CANopen object index - and sub-index if available - is an address pointer to a data location. The 16-bit index and 8-bit sub index make it effectively a 24-bit address space. The data type can be any type typically found in digital systems, such as 8-bit, 16-bit, 32-bit, or string. The data type can also be a record (in the case of an index with sub-indices), with multiple record entries, and each entry can be of the above mentioned data type.

## 1.3 CANopen Message Structure

CANopen messages exchange information between the CANopen host (master) and the CANopen nodes (slave). When collecting information, a host may either poll, or simply wait, for important messages in the network. Although the host may gather information through “polling” (i.e. the host continuously requesting information updates from each node), a more effective method is to exchange information in an interrupt driven fashion (i.e. information is exchanged only when there is new information available). Both mechanisms are possible within the CANopen framework, but the interrupt driven exchange method requires much less overhead, thus allowing higher data throughput. Most messages either read or write data to objects contained in the network nodes. There are 8 types of messages used in a CANopen system. Each message type gets a detailed explanation in CANopen Messages. Regardless of message type, the general structure of a CANopen message is the same. CANopen messages fit within one CAN frame where there are only two parts of the CAN frame the user needs to access, namely the Arbitration, and Data fields. All other fields are automatically configured by the CAN hardware.

**FIGURE 1.1 CANopen frame bit sequence**



### 1.3.1 The Arbitration Field

The values in the arbitration field set the priority of the message. The closer the value is to 0h, the higher the priority of the message. Higher priority messages will dominate, or take precedence, over other messages on the CAN bus. Arbitration of the CAN bus is done at the CAN hardware level, thus ensuring that the highest priority message is transmitted first. CANopen message priority is determined by the message COB-ID bits and the RTR (Remote Transmit Request) bit. Within the CANopen framework, there are 7 COB-ID ranges. One COB-ID range is used twice, resulting in 8 message types. Each message type is described in detail in CANopen Messages.

**TABLE 1.1 Arbitration field values.**

| Arbitration Field |        | Data Field |        |        |        |        |        |        |        |
|-------------------|--------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | RTR    | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 11-bit Identifier | 1 or 0 | xx         | xx     | xx     | xx     | xx     | xx     | xx     | xx     |

**COB-ID** Every CANopen message has a unique COB-ID that identifies the message type and in case of node specific messages, the node number. [Table 1.2](#) contains the COB-ID or COB-ID range for each message type. In the case of a range of COB-IDs, the actual COB-ID for a message will depend on which node receives or transmits the message. These COB-IDs begin with a base number (assigned in CiA's DS301 specification) and the addition of the NODE-ID completes the COB-ID. If the COB-ID field base is 600h, for example, a COB-ID of 605h pertains to a message (of type SDO as per [table 2](#) below) to/from node 5 in the CANopen network. Each message type is described in detail in CANopen Messages.

**TABLE 1.2** CANopen message types

| Message Type      | Description                         | COB-ID      |
|-------------------|-------------------------------------|-------------|
| NMT               | Network Management (broadcast)      | 0h          |
| NMT Error Control | Network management error control    | 701h – 77Fh |
| BOOT-UP           | Boot-Up message                     | 701h – 77Fh |
| SYNC              | Synchronization message (broadcast) | 80h         |
| EMERGENCY         | Emergency messages                  | 81h - FFh   |
| TIME STAMP        | Time stamp (broadcast)              | 100h        |
| PDO               | Process Data Objects                | 181h - 57Fh |
| SDO               | Service Data Objects                | 581h – 67Fh |

**RTR Bit** The remote transmission request (RTR) bit is used in some specific cases when the host would like to request information from a node. In particular, the RTR bit is used for node guard and TPDO requests. With the exception of these two cases, the RTR bit is always set to 0.

**Node-ID** Every node on the CANopen network must have a unique node-ID, between 1 and 127. Node 0 is always considered the host. See the hardware manual for configuration of the drive node-ID.

### 1.3.2 The Data Field

The content of the Data field depends on the CANopen message type. Detailed information about the CANopen message data is found under the appropriate message type in [“CANopen Messages” on page 5](#) while details on each object are found in the [“Object Dictionary” on page 70](#).

**Little Endian Format** Numerical data larger than 1 byte must be organized into “Little Endian” format. This means that the data is broken into its individual bytes and sent Least-Significant-Byte-First. The 24-bit number 102315h, for example, must be transmitted LSB (Least Significant Byte) first as 15h 23h 10h (as shown in [Table 1.3](#) below).

**TABLE 1.3** Sending 102315h in Little Endian format

| Arbitration Field |     | Data Field |        |        |        |        |        |        |        |
|-------------------|-----|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | RTR | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| XXXh              | X   | 15h        | 23h    | 10h    | 00h    | 00h    | 00h    | 00h    | 00h    |

### 1.3.3 CAN Bus Traffic Concerns

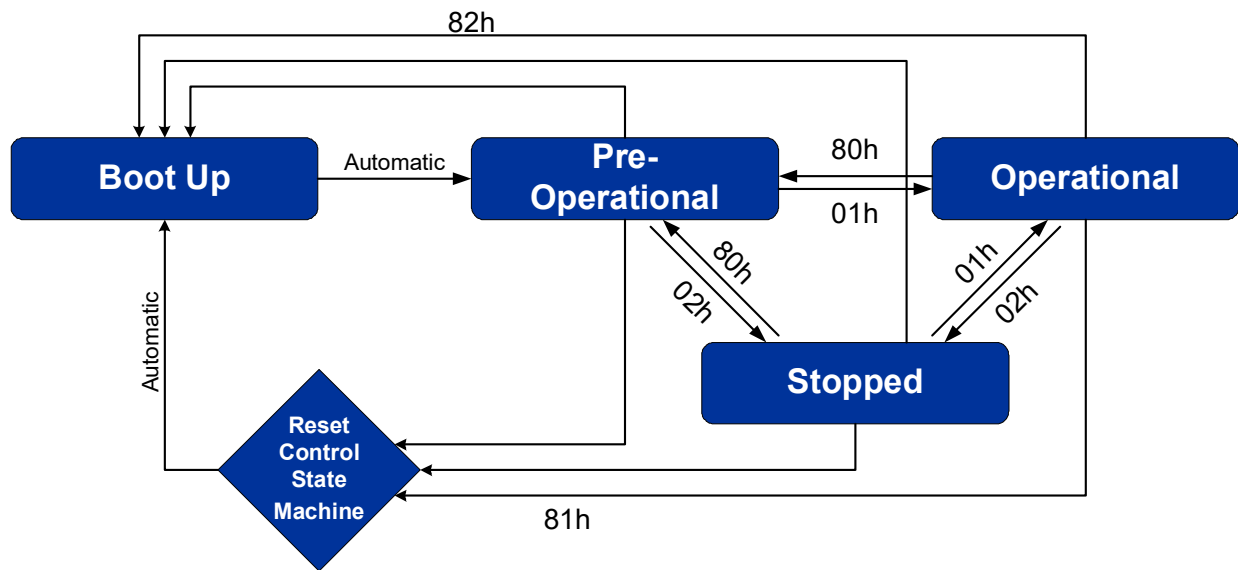
It is best to keep the network idle for at least 50% of the time (50% bus load). Busload will depend on CAN bus bit rate and CANopen message rates.

## 1.4 CANopen Messages

AMC CANopen drives support 8 message types. Each message type fits within the defined structure of a CAN frame. The data field of each message type can vary, but all messages require the arbitration field to be populated with the appropriate COB-ID. NMT service, SYNC, and TIME STAMP messages have fixed COB-ID's while the other message types use a range of values.

### 1.4.1 NMT Messages

**FIGURE 1.2 Communication State Machine Operation**



Every CANopen device contains an internal Network Management server that communicates with an external NMT master. One device in a network, generally the host, may act as the NMT master. Through NMT messages, each CANopen device's network management server controls state changes within its built-in Communication State Machine. This is independent from each node's operational state machine, which is device dependant and described in Control State Machine. It is important to distinguish a CANopen device's operational state machine from its Communication State Machine. CANopen sensors and I/O modules, for example, have completely different operational state machines than servo drives. The Communication State Machine in all CANopen devices, however, is identical as specified by the DS301.

NMT messages have the highest priority. The 5 NMT messages that control the Communication State Machine each contain 2 data bytes that identify the node number and a

command to that node's state machine. [Table 1.5](#) shows the 5 NMT messages supported by AMC, and [Table 1.4](#) shows the correct message construction for sending these messages.

**TABLE 1.4 NMT message construction**

| Arbitration Field |     | Data Field                    |                               |                      |        |        |        |        |        |
|-------------------|-----|-------------------------------|-------------------------------|----------------------|--------|--------|--------|--------|--------|
| COB-ID            | RTR | Byte 1                        | Byte 2                        | Byte 3               | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 000h              | 0   | See <a href="#">Table 1.5</a> | See <a href="#">Table 1.5</a> | These bytes not sent |        |        |        |        |        |

**TABLE 1.5 NMT messages supported by AMC CANopen servo drives.**

| NMT Message           | COB-ID | Data Bytes |          | Description                                                                                                                                                  |
|-----------------------|--------|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |        | 1          | 2        |                                                                                                                                                              |
| Start Remote Node     | 0      | 01h        | Node-ID* | Sets the CANopen communication state machine on the designated node to Operational.                                                                          |
| Stop Remote Node      | 0      | 02h        | Node-ID* | Sets the CANopen communication state machine on the designated node to Stopped.                                                                              |
| Pre-Operational State | 0      | 80h        | Node-ID* | Sets the CANopen communication state machine on the designated node to Pre-Operational. In the pre-operational state, only NMT and SDO messages are allowed. |
| Reset Node            | 0      | 81h        | Node-ID* | Resets the designated node (same as power cycle). Results in a Boot Up message sent by the node.                                                             |
| Reset Communication   | 0      | 82h        | Node-ID* | Resets CANopen communication state machine on the designated node. Results in a Boot Up message sent by the node.                                            |

\*Node-ID = Drive address (1...7Fh)

**Boot-Up State** Upon power-up, each drive initializes by going through the Reset Node and Reset Communication states. If the initialization process succeeds, the drive sends out a Boot-Up message and goes into the Pre-Operational state.

**Pre-Operational State** Communication is limited to all message types except PDO messages. In this state, the NMT master can command the communication state machine to enter any of the states listed in [Table 1.9](#) below. Generally, the host keeps a node in pre-operational state during setup and configuration.

**Operational State** Enables all message types including PDO messages. In this state, the NMT master can command the communication state machine to enter any of the states listed in [Table 1.5](#).

**Stopped State** Disables all message types except NMT messages; Node Guarding / Life Guarding (see below) remains active.

## NMT Message Examples

**TABLE 1.6 NMT Message Examples**

| COB-ID | Number of Bytes | Message / Data | Description                                                                                                                                                                   |
|--------|-----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 000    | 2               | 80 01          | Host: NMT Host commands node 1 into Pre-Operational state                                                                                                                     |
| 000    | 2               | 01 01          | Host: NMT Host commands node 1 into Operational state                                                                                                                         |
| 000    | 2               | 02 01          | Host: NMT Host commands node 1 into Stopped state                                                                                                                             |
| 000    | 2               | 81 01          | Host: NMT Host commands a Reset to Node 1                                                                                                                                     |
| 701    | 1               | 00             | Node 1 response: Cycles through the standard boot-up states stopping in the Pre-operational state. The control state machine is also reset. This is the same as a power cycle |
| 000    | 2               | 82 01          | Host: NMT Host commands Communication Reset                                                                                                                                   |
| 701    | 1               | 00             | Node 1 response: Cycles through the standard boot-up states stopping in the Pre-operational state. The control state machine does not reset and retains full motion control.  |

### 1.4.2 NMT Error Control

AMC CANopen drives support Node Guarding, Life Guarding, and Heartbeat protocol as NMT error controls.

**Node Guarding** The NMT Master can monitor the communication status of each node using the Node Guarding protocol. During node guarding, a drive is polled periodically and is expected to respond with its communication state within a pre-defined time frame. Acceptable states are shown in [Table 1.9](#). Note that responses indicating an acceptable state will alternate between two different values due to a toggle bit in the returned value. If there is no response, or an unacceptable state occurs, the NMT master reports an error to its host application. The Node Guard message is sent at time intervals, determined by the Guard Time (object 100Ch). The NMT slave (node) must reply to this message before the end of this time interval. [Table 1.7](#) and [Table 1.8](#) show the message format for an NMT master request and the correct NMT slave response. Note that the slave always responds with a toggle bit in byte 1, therefore the response will toggle between the two values shown in [Table 1.9](#).

**Life Guarding** Similarly, the NMT slave monitors the status of the NMT master (Life Guarding). This event utilizes the Guard Time (object 100Ch) and Life Time Factor (object 100Dh) to determine a “Lifetime” for each NMT slave (Lifetime = Guard Time X Life Time Factor). If a node does not receive a Node Guard message within its Lifetime, the node assumes communication with the host is lost and triggers a communication error event. Each node may have a different Lifetime.

**TABLE 1.7 NMT master Node Guard request (host to node).**

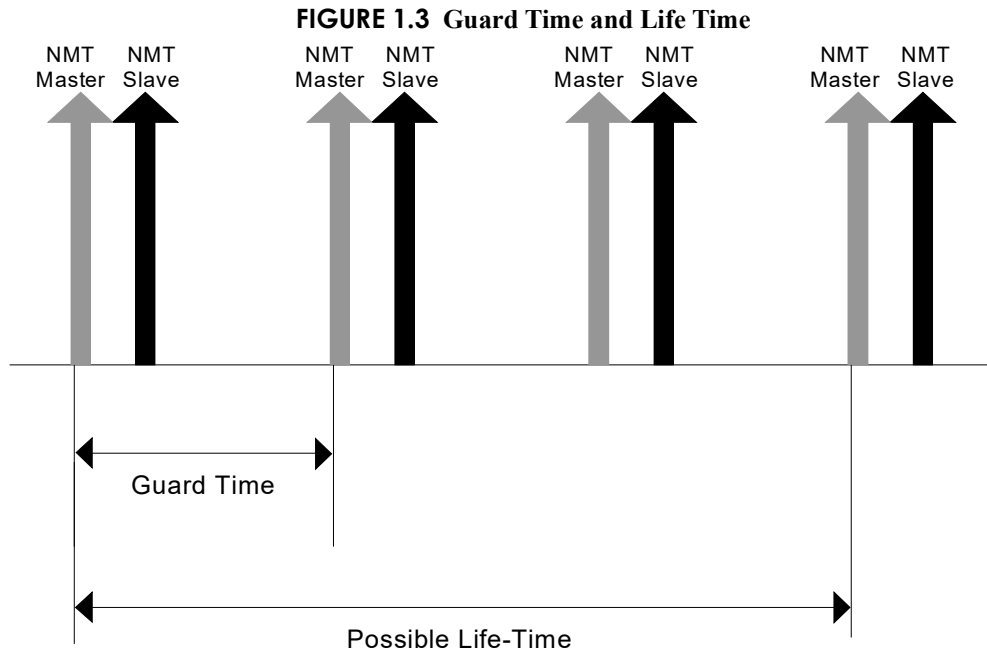
| Arbitration Field |     | Data Field           |        |        |        |        |        |        |        |
|-------------------|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | RTR | Byte 1               | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 700h + Node-ID    | 1   | These bytes not sent |        |        |        |        |        |        |        |

**TABLE 1.8** NMT slave Node Guard reply (node to host).

| Arbitration Field | Data Field                       |                      |        |        |        |        |        |        |
|-------------------|----------------------------------|----------------------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1                           | Byte 2               | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 700h + Node-ID    | See<br><a href="#">Table 1.9</a> | These bytes not sent |        |        |        |        |        |        |

**TABLE 1.9** Acceptable NMT slave return values.

| Return Value | Communication Status |
|--------------|----------------------|
| 4h or 84h    | STOPPED              |
| 5h or 85h    | OPERATIONAL          |
| 7Fh or FFh   | PRE-OPERATIONAL      |



Example of Guard Time and Life Time. The first grey arrow represents an NMT request from the master and the second black arrow represents an NMT response from the slave. In this case, the Life Time is a factor of 3X greater than the Guard Time.

**Node Guard / Life Guard Example** In this example, NMT messages are used to transition the Communication states of the drive while NodeGuarding is active. The shaded rows indicate how the node will respond to a given host command.

**TABLE 1.10 Node Guard/ Life Guard Example**

| COB-ID | Number of Bytes | Message / Data | Description                                                          |
|--------|-----------------|----------------|----------------------------------------------------------------------|
| 701    | 0               | RTR set        | Host sends first node guard message within GuardTime                 |
| 701    | 1               | 04             | Node replies in STOP state                                           |
| 701    | 0               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 1               | 84             | Node replies in STOP state, Toggle Bit alternates                    |
| 701    | 0               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 1               | 04             | Node replies in STOP state, Toggle Bit alternates                    |
| 000    | 2               | 80 01          | NMT host changes node communication state machine to Pre-Operational |
| 701    | 0               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 1               | FF             | Node replies in PRE-Operational state, Toggle Bit alternates         |
| 701    | 0               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 1               | 7F             | Node replies in PRE-Operational state, Toggle Bit alternates         |
| 000    | 2               | 01 01          | NMT host changes node communication state machine to Operational     |
| 701    | 1               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 0               | 85             | Node replies in Operational state, Toggle Bit alternates             |
| 701    | 1               | RTR set        | Host sends next node guard message within GuardTime                  |
| 701    | 0               | 05             | Node replies in Operational state, Toggle Bit alternates             |

**Heartbeat** The heartbeat error control method uses a producer to generate a periodic message. One or more consumer devices on the network listen for this message. If the producer fails to generate a message within a specified time frame, the consumer acts accordingly. Any drive on the network can be configured to be a producer or a consumer. The producer heartbeat time (object 1017h) represents the time in milliseconds between successive heartbeat messages. It can be any integer value between 1 and 65535. When set to zero, the producer heartbeat is disabled. The consumer heartbeat time (object 1016h) represents the time in milliseconds in which the consumer should expect to receive a heartbeat message. If a heartbeat is not detected within this time frame, the drive will flag a communication error. The action taken during a communication error is configurable. The consumer heartbeat time can be any integer value between 1 and 65535. When set to zero, the consumer heartbeat detection is disabled. See [Table 1.11](#) below for the bit assignment definitions.

**TABLE 1.11 Consumer Heartbeat Time (Object 1016) bit descriptions**

| Bits 31 – 24             | Bits 23 – 16              | Bits 15 – 0    |
|--------------------------|---------------------------|----------------|
| Reserved (value: 0x 00h) | Producer Node-ID (1 - FF) | Heartbeat Time |

Generally, when a host sends a heartbeat message to a node, the message sent is this:

| COB-ID        | Number of Bytes | Message / Data |
|---------------|-----------------|----------------|
| 700 + Node-ID | 1               | 00             |



When a drive is set to produce a heartbeat, the byte echoed out is the NMT state of the drive. The possible NMT states are:

| Message / Data | NMT State       |
|----------------|-----------------|
| 0 (0 hex)      | Bootup          |
| 4 (4 hex)      | Stopped         |
| 5 (5 hex)      | Operational     |
| 127 (7F hex)   | Pre-operational |

**TABLE 1.12 Heartbeat Example 1 - set up node 3 to consume heartbeats every 2 seconds**

| COB-ID | Number of Bytes | Message / Data          | Description                                                              |
|--------|-----------------|-------------------------|--------------------------------------------------------------------------|
| 603    | 8               | 22 16 10 01 D0 07 01 00 | set consumer time (0x1016) for 2sec (0x07D0 = 2000ms), monitor Node-ID 1 |
| 701    | 1               | 00                      | heartbeat message from host                                              |
|        |                 |                         | no response is seen from drive                                           |

**TABLE 1.13 Heartbeat Example 2 - set up node 3 to produce heartbeats every 3 seconds**

| COB-ID | Number of Bytes | Message / Data          | Description                                           |
|--------|-----------------|-------------------------|-------------------------------------------------------|
| 603    | 8               | 22 17 10 00 B8 0B 00 00 | set producer time (0x1017) for 3sec (0x0BB8 = 3000ms) |
| 583    | 8               | 60 17 10 00 00 00 00 00 |                                                       |
| 703    | 1               | 7F                      | heartbeats from drive (pre-operational state)         |
| 703    | 1               | 7F                      |                                                       |
| 703    | 1               | 7F                      |                                                       |

**TABLE 1.14 Heartbeat Example 3 - set up node 2 to consume heartbeats from node 3**

| COB-ID | Number of Bytes | Message / Data          | Description                                                            |
|--------|-----------------|-------------------------|------------------------------------------------------------------------|
| 602    | 8               | 22 16 10 01 D0 07 03 00 | set up consumer time (0x1016) for 2sec (0x07D0 = 2000ms) and node ID 3 |
| 582    | 8               | 60 17 10 00 00 00 00 00 |                                                                        |
| 603    | 8               | 22 17 10 00 E8 03 00 00 | set producer time (0x1017) for 1sec (0x03E8 = 1000ms)                  |
| 583    | 8               | 60 17 10 00 00 00 00 00 |                                                                        |
| 703    | 1               | 7F                      | node 3 sends out heartbeats                                            |
| 703    | 1               | 7F                      |                                                                        |
|        |                 |                         | no response is seen from node #2                                       |

### 1.4.3 BOOT-UP Message

The drive transmits a boot-up message after power up, communication reset, or application reset events. The CANopen master can monitor the drive and report an error if no boot-up message was received. The boot-up message of an AMC CANopen drive uses the same COB-ID as a Node Guard reply.

**TABLE 1.15** Boot-up message from AMC CANopen drives.

| Arbitration Field | Data Field |                      |        |        |        |        |        |        |
|-------------------|------------|----------------------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2               | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 700h + Node-ID    | 00         | These bytes not sent |        |        |        |        |        |        |

**Boot-Up Example** These are messages sent from three drives powered up in random order. Data is always 00h for boot up messages.

**TABLE 1.16** Boot-up Example

| COB-ID | Number of Bytes | Message / Data | Description     |
|--------|-----------------|----------------|-----------------|
| 701    | 1               | 00             | Node 1 boots up |
| 703    | 1               | 00             | Node 3 boots up |
| 702    | 1               | 00             | Node 2 boots up |

## 1.4.4 SYNC Message

The SYNC message serves as a network “trigger” and is used to coordinate events across multiple CANopen nodes. For example, the CANopen host may need to obtain the actual motor position at a specific time, for several nodes. An AMC CANopen drive can be pre-configured to read and broadcast its actual position the instant a SYNC message is received. SYNC messages carry no data. AMC drives receive SYNC messages, but cannot produce them. For more information on the SYNC message, see (DS301).

**TABLE 1.17 Sync message format (host to node).**

| Arbitration Field |     | Data Field           |        |        |        |        |        |        |        |
|-------------------|-----|----------------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | RTR | Byte 1               | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 80h               | 0   | These bytes not sent |        |        |        |        |        |        |        |

**SYNC Message Example** In this example TPD01 (1800.02h) is configured to report the StatusWord every second Sync message the host broadcasts. This example starts with the host setting Node 1 into the Operational state so PDOs may be processed by the drive.

**TABLE 1.18 SYNC Message Example**

| COB-ID | Number of Bytes | Message / Data | Description                                                        |
|--------|-----------------|----------------|--------------------------------------------------------------------|
| 000    | 2               | 01 01          | Host: NMT command puts Node 1 into Operational state.              |
| 80     | 0               | None           | Host: 1 <sup>st</sup> Sync message                                 |
| 80     | 0               | None           | Host: 2 <sup>nd</sup> Sync message                                 |
| 231    | 2               | 60 06          | Node 1 response: TPD01 (1A00.01h) sends data containing StatusWord |
| 80     | 0               | None           | Host: 3 <sup>rd</sup> Sync message                                 |
| 80     | 0               | None           | Host: 4 <sup>th</sup> Sync message                                 |
| 231    | 2               | 60 06          | Node 1 response: TPD01 (1A00.01h) sends data containing StatusWord |

## 1.4.5 EMERGENCY Messages

EMERGENCY messages are sent by the CANopen nodes to provide important status information to the CANopen host controller. An emergency object is transmitted only once per error event by the drive, and uses the same COB-ID as the sync message plus the node ID. AMC servo drives utilize EMERGENCY messages to indicate PVT buffer status information to the CANopen host controller. The following tables describe the error codes supported by AMC CANopen drives.

**TABLE 1.19 Emergency Object Data**

| Arbitration Field | Data Field |        |        |                                  |                  |        |        |        |
|-------------------|------------|--------|--------|----------------------------------|------------------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4                           | Byte 5           | Byte 6 | Byte 7 | Byte 8 |
| 80h + Node-ID     | 00         | 00     | 00     | Error Code.<br>See (Table 1.20). | See (Table 1.20) |        |        |        |

### EMERGENCY Error Codes

**TABLE 1.20 Emergency Error Codes supported by AMC CANopen drives.**

| Error Code | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Bytes 5 – 8            |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------|---|--------------------------|---|---------------|---|-----------------------|---|------------------------------|---|-------------------------------------|---|---------------------------------------------|---|----------------------|---|----------------------|----------------|
| 00h        | PVT Sequence Counter Error                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Required counter value |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 01h        | PVT Cannot be started                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Internal use only      |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 02h        | PVT Buffer Underflow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0h                     |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 80h - FFh  | <p>RPDO Cannot be Processed</p> <p>Bit Definitions are defined as follows when Bit 7 = 1</p> <p>Bits 4 - 6 = Subtract 1 from the value read in these bits to get the Sub-index of the RPDO Mapping Parameter that caused the error.</p> <p>Bits 0 - 3 = Error Description Values (1h - 7h) where:</p> <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>RPDO cannot be processed</td></tr><tr><td>1</td><td>General Error</td></tr><tr><td>2</td><td>Object does not exist</td></tr><tr><td>3</td><td>Not writable or Not readable</td></tr><tr><td>4</td><td>Access unsupported in present state</td></tr><tr><td>5</td><td>Not enough space in the PDO for object data</td></tr><tr><td>6</td><td>Data integrity error</td></tr><tr><td>7</td><td>Internal write error</td></tr></table> | Value                  | Description | 0 | RPDO cannot be processed | 1 | General Error | 2 | Object does not exist | 3 | Not writable or Not readable | 4 | Access unsupported in present state | 5 | Not enough space in the PDO for object data | 6 | Data integrity error | 7 | Internal write error | COB-ID of RPDO |
| Value      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 0          | RPDO cannot be processed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 1          | General Error                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 2          | Object does not exist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 3          | Not writable or Not readable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 4          | Access unsupported in present state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 5          | Not enough space in the PDO for object data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 6          | Data integrity error                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |
| 7          | Internal write error                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |             |   |                          |   |               |   |                       |   |                              |   |                                     |   |                                             |   |                      |   |                      |                |

**EMERGENCY Message Examples** These examples demonstrate several emergency messages and what the data will look like coming from the drive.

**TABLE 1.21 EMERGENCY Message Examples**

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                                                                                                                                                 |
|--------|-----------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 81     | 8               | 00 00 00 00 03 00 00 00 | The 3 <sup>rd</sup> counter value was skipped when filling the PVT buffer of Node 1.                                                                                                                                                        |
| 83     | 8               | 00 00 00 01 00 00 00 00 | PVT cannot be started on node 3. It happens to be in the wrong state here.                                                                                                                                                                  |
| 81     | 8               | 00 00 00 84 01 05 00 00 | 84 indicates an RPDO that cannot be processed because access is not supported in the present state. 0501 indicates the COB-ID of the RPDO. This message occurred because write access to the drive was disabled before attempting to write. |

### 1.4.6 TIME STAMP Message

The TIME STAMP message provides a “global clock” for all the nodes on the CANopen network. The TIME STAMP message data field contains the host controller time. It is used for synchronization between nodes. This can be very important for applications that require long-term time synchronization.

Each drive uses not only the time data contained in the time stamp messages, but also the time between each time stamp message to synchronize to both host timing and frequency. If there is jitter in the host’s time stamp messages, there will be some jitter in the drive timing.

The data field uses a 6 byte “Time Of Day” field defined in CiA’s DS301. Time Of Day contains two components: the number of milliseconds after midnight (4 bytes), and the present day since January 1, 1984 (2 bytes).

**TABLE 1.22 Time stamp message data.**

| Arbitration Field |     | Data Field                                       |        |        |        |                            |        |        |        |
|-------------------|-----|--------------------------------------------------|--------|--------|--------|----------------------------|--------|--------|--------|
| COB-ID            | RTR | Byte 1                                           | Byte 2 | Byte 3 | Byte 4 | Byte 5                     | Byte 6 | Byte 7 | Byte 8 |
| 100h              | 0   | Time, after Midnight in Milliseconds (LSB first) |        |        |        | Current day since 01/01/84 |        | N/A    | N/A    |

#### Time Stamp Tips

- Once activated, time stamps can only be turned off with a drive-reset or CAN NMT reset message.
- A communications error will be flagged in the drive if time between time stamps exceeds  $2^{31} \mu\text{s}$  (about 35 minutes).
- Time stamps may occur non-periodically.
- The drive will not detect a missing time stamp.

**TIME STAMP Example** This example starts the drive at midnight on the 1<sup>st</sup> day of January 1984 as dictated by the CiA’s DS301. Generally the current time and day would be filled in and sent

automatically. AMC CANopen servo drives do not respond to time stamps with messages, therefore there is no node response shown.

**TABLE 1.23**

| COB-ID      | Number of Bytes | Message / Data          | Description                                                                           |
|-------------|-----------------|-------------------------|---------------------------------------------------------------------------------------|
| 100         | 8               | 00 00 00 00 00 00 00 00 | Very first timestamp Resets timers on all nodes to the value contained in bytes 1 – 6 |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | F4 01 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | E8 03 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | DC 05 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | D0 07 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | C4 09 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |
| Wait 500 ms |                 |                         |                                                                                       |
| 100         | 8               | B8 0B 00 00 00 00 00 00 | Broadcast message reporting time is now 500 ms later                                  |

## 1.5 SDO vs. PDO Messages

There are two methods for reading and writing data to objects: Service Data Object (SDO) and Process Data Object (PDO) messages. An SDO consists of an outgoing message from host to node, possibly some intermediate messages between host and node, and a reply message from node to host; this is referred to as confirmed messaging. A PDO consists of a single unconfirmed message that requires less bus traffic relative to its SDO counterpart. Although PDOs make more efficient use of the CAN bus than do SDOs, PDO messages must be configured prior to using (see [PDO Configuration](#)). Furthermore, PDOs are restricted to the transmission of no more than 8 bytes whereas there is no limitation to the number of bytes SDOs can transfer. SDO messages may be used any time but are generally used before actual drive operation for set-up and configuration. PDO messages are generally used during drive operation, such as for setting target commands.

### 1.5.1 SDO Messages

AMC CANopen servo drives support read and write SDO messages that can be divided into 4 categories:

- Reading objects that contain 4 or less data bytes (expedited read)
- Writing to objects that contain 4 or less data bytes (expedited write)
- Reading objects that contain more than 4 data bytes (segmented read)
- Writing to objects that contain more than 4 data bytes (segmented write)

The first data byte in the Data field, called the ‘command’ byte, is used to determine any of the above possible cases. Then, depending upon the particular case, the next 3 bytes may be used to specify an object index with 4 bytes left for object data or all 7 remaining bytes may be used purely for object data. It is important to distinguish between the data bytes of the Data field and the data bytes of an object. The data bytes of the Data field are the 8 bytes of a CAN frame whereas the object data bytes refer to the information stored in an object. Of the bytes used for object data, only some may be used with the others left empty (equal to zero). For example, if an SDO message is used to read an object with only 2 bytes of information, then only two of the data bytes in the returned message will contain the relevant data while the others will be left equal to zero. However, there may be cases where the relevant data is also equal to zero. In this case, there must be a way to distinguish relevant data bytes from empty data bytes. If the message recipient knows how many bytes to expect, then there is no issue. Otherwise, size indication is needed. Although size indication is specified in DS301 it is also not required. To comply with this, AMC CANopen drives offer an SDO Size Indicated Answer (20E6.04h) for enabling and disabling size indication as defined by DS301.

**Expedited SDO Messages** This is a 1-step process and applies only when reading / writing objects with 4 or less data bytes (e.g. 8-bit, 16-bit, 32-bit data types). Expedited messages are simple read / write commands where the complete set of data is included in the last four bytes of the message (write command), or the last 4 bytes of the reply (read command). Whether the host is reading or writing to a node, the process requires only one command and one reply.

**Segmented SDO Messages** This is a multi-step process that applies when reading / writing messages larger than 4 bytes (e.g. string). Step 1, called “initiation,” is merely handshaking between the host and node. To initialize communication, the host gives a command, and the node responds confirming that it is ready for data exchange. No data is exchanged during the initiation step. The next steps are the actual data exchange. This can include many messages between the host and the node. The command byte, in these steps, contains a “Toggle Bit” and “Last Segment” bit. In these steps, every message the host sends to the drive must alternate the toggle bit (this is done automatically by following the procedures for message construction below). The last segment bit is only set to 1 when the current message contains the last of the data to transfer; this indicates that the process is finished. Only one SDO message can be transmitted at a time. That is, you cannot request an expedited SDO mid-way through a segmented SDO and then continue the segmented SDO.

**TABLE 1.24 Expedited SDO Read (4 or less data bytes)**

| SDO READ, EXPEDITED (4 or less bytes)       |            |                    |                    |           |                         |        |        |        |
|---------------------------------------------|------------|--------------------|--------------------|-----------|-------------------------|--------|--------|--------|
| Step 1a: Host initiates Read command        |            |                    |                    |           |                         |        |        |        |
| Arbitration Field                           | Data Field |                    |                    |           |                         |        |        |        |
| COB-ID                                      | Byte 1     | Byte 2             | Byte 3             | Byte 4    | Byte 5                  | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                             | 40h        | Object Index (LSB) | Object Index (MSB) | Sub-Index | Use 00h for all 4 bytes |        |        |        |
| Step 1b: Node Replies to host with all data |            |                    |                    |           |                         |        |        |        |
| Arbitration Field                           | Data Field |                    |                    |           |                         |        |        |        |

| COB-ID          | Byte 1                                                     | Byte 2                | Byte 3                | Byte 4    | Byte 5          | Byte 6 | Byte 7 | Byte 8 |
|-----------------|------------------------------------------------------------|-----------------------|-----------------------|-----------|-----------------|--------|--------|--------|
| 580h + Node-ID* | 42h, 4Fh, 4Bh,<br>or 43h See<br><a href="#">Table 1.26</a> | Object Index<br>(LSB) | Object Index<br>(MSB) | Sub-Index | Data, LSB first |        |        |        |

\*Node-ID is node address (0...7Fh)

**TABLE 1.25 Host to node Initiate read, more than 4 bytes**

| SDO READ, SEGMENTED (more than 4 bytes)     |                                                  |                         |                    |           |                                    |        |        |        |
|---------------------------------------------|--------------------------------------------------|-------------------------|--------------------|-----------|------------------------------------|--------|--------|--------|
| STEP 1a. Host request for data              |                                                  |                         |                    |           |                                    |        |        |        |
| Arbitration Field                           | Data Field                                       |                         |                    |           |                                    |        |        |        |
| COB-ID                                      | Byte 1                                           | Byte 2                  | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                             | 40h                                              | Object Index (LSB)      | Object Index (MSB) | Sub-Index | Use 00h for all 4 bytes            |        |        |        |
| STEP 1b. Node reply, ready to transmit data |                                                  |                         |                    |           |                                    |        |        |        |
| Arbitration Field                           | Data Field                                       |                         |                    |           |                                    |        |        |        |
| COB-ID                                      | Byte 1                                           | Byte 2                  | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID*                             | 40h or 41h See <a href="#">Table 1.26</a> STEP 1 | Object Index (LSB)      | Object Index (MSB) | Sub-Index | 00h or Number of bytes to transfer |        |        |        |
| STEP 2a. Host confirms, ready for data      |                                                  |                         |                    |           |                                    |        |        |        |
| Arbitration Field                           | Data Field                                       |                         |                    |           |                                    |        |        |        |
| COB-ID                                      | Byte 1                                           | Byte 2                  | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                             | 60h<br>See <a href="#">Table 1.26</a> STEP 2     | Use 00h for all 7 bytes |                    |           |                                    |        |        |        |
| STEP 2b. Node replies with data             |                                                  |                         |                    |           |                                    |        |        |        |
| Arbitration Field                           | Data Field                                       |                         |                    |           |                                    |        |        |        |
| COB-ID                                      | Byte 1                                           | Byte 2                  | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID*                             | See <a href="#">Table 1.26</a> STEP 2            | Data, LSB first         |                    |           |                                    |        |        |        |

\*Node-ID is node address (0...7Fh)



**TABLE 1.26 READ Command (Byte 1) values and their meaning**

| Usage                                                         | Command Byte values          | Meaning                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Read SDO<br>Step 1                                            | 40h                          | Always used by host when initiating read process. Does not include size indication. Used by node when replying to hosts' initiate read command, but only when object 20E6.04h = 0 and there are more than 4 bytes to transfer.                                                                                  |
|                                                               | 41h                          | Used by node only when replying to read initiation and there are more than 4 bytes to transfer. Bytes 5 – 8 will indicate number of bytes the node has to transfer (LSB first). Only occurs if object 20E6.04h ≠ 0, otherwise node will reply with 40h instead.                                                 |
|                                                               | 42h                          | Used by node when replying to read command with 4 or less data bytes in 5 – 8 (LSB first). Actual number of valid bytes is not indicated. Only occurs if object 20E6.04h = 0.                                                                                                                                   |
|                                                               | 4Fh                          | Used by node when replying to read command with exactly 1 data byte, i.e. reading an 8-bit object. Use only byte 5 (ignore 6 – 8). Only occurs if object 20E6.04h ≠ 0, otherwise node will use 42h.                                                                                                             |
|                                                               | 4Bh                          | Used by node when replying to read command with exactly 2 data bytes in bytes 5 and 6, i.e. reading a 16-bit object (ignore 7 and 8). Only occurs if object 20E6.04h ≠ 0, otherwise node will use 42h.                                                                                                          |
|                                                               | 43h                          | Used by node when replying to read command with exactly 4 data bytes in bytes 5 – 8, i.e. reading a 32-bit object. Only occurs if object 20E6.04h ≠ 0, otherwise node will use 42h.                                                                                                                             |
| Read SDO<br>Step 2<br>Only data transfers larger than 4 bytes | 60h                          | Used by host. Second step to "Segmented" read process always begins with 60h. Each time the node replies with data, the host must toggle between 60h and 70h. If the host does not toggle between two consecutive messages, the node will abort transfer with 80h.                                              |
|                                                               | 70h                          |                                                                                                                                                                                                                                                                                                                 |
|                                                               | 0h                           | Reply from node. Will only occur if host used 60h in the previous command and there is more data to transmit. In this case the host should send another message using 70h in byte 1 and 00h for all other bytes to retrieve more data.                                                                          |
|                                                               | 1h                           | Reply from node. Will only occur if host used 60h in the previous command and this message contains the last of the data.                                                                                                                                                                                       |
|                                                               | 10h                          | Reply from node. Will only occur if host used 70h in the previous command and there is more data to transmit. In this case the host should send another message using 60h in byte 1 and 00h for all other bytes to retrieve more data.                                                                          |
|                                                               | 11h                          | Reply from node. Will only occur if host used 70h in the previous command and this message contains the last of the data.                                                                                                                                                                                       |
|                                                               | 3h, 5h, 7h, 9h, Bh, Dh       | Same as 1h except the number of bytes not containing data is specified. 3h if only the last byte contains no data, 5h if only the last two bytes do not contain data, and onwards up to Dh if the last 6 bytes do not contain data. Only occurs if object 20E6.04h ≠ 0, otherwise node will reply with 1h.      |
|                                                               | 13h, 15h, 17h, 19h, 1Bh, 1Dh | Same as 11h except the number of bytes not containing data is specified. 13h if only the last byte contains no data, 15h if only the last two bytes do not contain data, and onwards up to 1Dh if the last 6 bytes do not contain data. Only occurs if object 20E6.04h ≠ 0, otherwise node will reply with 11h. |

**TABLE 1.27 Expedited SDO Write (4 or less data bytes)**

| SDO WRITE, EXPEDITED (4 or less data bytes)     |                                                      |                    |                    |           |                 |        |        |        |
|-------------------------------------------------|------------------------------------------------------|--------------------|--------------------|-----------|-----------------|--------|--------|--------|
| Step 1a: Host initiates write command with data |                                                      |                    |                    |           |                 |        |        |        |
| Arbitration Field                               | Data Field                                           |                    |                    |           |                 |        |        |        |
| COB-ID                                          | Byte 1                                               | Byte 2             | Byte 3             | Byte 4    | Byte 5          | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                                 | 22h, 2Fh, 2Bh, or 23h See <a href="#">Table 1.29</a> | Object Index (LSB) | Object Index (MSB) | Sub-Index | Data, LSB first |        |        |        |
| Step 1b: Node Replies to host with all data     |                                                      |                    |                    |           |                 |        |        |        |
| Arbitration Field                               | Data Field                                           |                    |                    |           |                 |        |        |        |
| COB-ID                                          | Byte 1                                               | Byte 2             | Byte 3             | Byte 4    | Byte 5          | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID*                                 | 60h See <a href="#">Table 1.29</a>                   | Object Index (LSB) | Object Index (MSB) | Sub-Index | Ignore          |        |        |        |

\*Node-ID is node address (0...7Fh)

**TABLE 1.28 Host to node Initiate write, more than 4 bytes**

| SDO WRITE, SEGMENTED (more than 4 data bytes) |                                                    |                    |                    |           |                                    |        |        |        |
|-----------------------------------------------|----------------------------------------------------|--------------------|--------------------|-----------|------------------------------------|--------|--------|--------|
| STEP 1a. Host initiates data transfer         |                                                    |                    |                    |           |                                    |        |        |        |
| Arbitration Field                             | Data Field                                         |                    |                    |           |                                    |        |        |        |
| COB-ID                                        | Byte 1                                             | Byte 2             | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                               | 20h or 21h<br>See <a href="#">Table 1.29</a>       | Object Index (LSB) | Object Index (MSB) | Sub-Index | 00h or Number of bytes to transfer |        |        |        |
| STEP 1b. Node reply, ready to accept data     |                                                    |                    |                    |           |                                    |        |        |        |
| Arbitration Field                             | Data Field                                         |                    |                    |           |                                    |        |        |        |
| COB-ID                                        | Byte 1                                             | Byte 2             | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID*                               | 60h<br>See <a href="#">Table 1.29</a>              | Object Index (LSB) | Object Index (MSB) | Sub-Index | 00h                                |        |        |        |
| STEP 2a. Host begins data transfer            |                                                    |                    |                    |           |                                    |        |        |        |
| Arbitration Field                             | Data Field                                         |                    |                    |           |                                    |        |        |        |
| COB-ID                                        | Byte 1                                             | Byte 2             | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID*                               | 0h, 1h, 10h, 11h<br>See <a href="#">Table 1.29</a> | Data, LSB first    |                    |           |                                    |        |        |        |
| STEP 2b. Node replies                         |                                                    |                    |                    |           |                                    |        |        |        |
| Arbitration Field                             | Data Field                                         |                    |                    |           |                                    |        |        |        |
| COB-ID                                        | Byte 1                                             | Byte 2             | Byte 3             | Byte 4    | Byte 5                             | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID*                               | 20h, or 30h<br>See <a href="#">Table 1.29</a>      | Ignore             |                    |           |                                    |        |        |        |

\*Node-ID is node address (0...7Fh)

**TABLE 1.29 WRITE Command (Byte 1) values and their meaning**

| Usage                                           | Command Byte values          | Meaning                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Initiates Write SDO more than 4 data bytes | 20h                          | Used by host when initiating a write process of more than 4 data bytes. Total number of bytes is not indicated. Node replies with 60h, confirming that it is ready to receive data.                                                                                                              |
|                                                 | 21h                          | Used by host when initiating a write process of more than 4 data bytes. Total number of bytes is indicated using bytes 5 – 8 (LSB first). Node replies with 60h, confirming that it is ready to receive data. Only use if object 20E6.04h $\neq$ 0, otherwise use 20h.                           |
| Host Initiates Write SDO 4 or less data bytes   | 22h                          | Used by host when writing 4 or less data bytes. Total number of data bytes not indicated. Node replies with confirmation 60h.                                                                                                                                                                    |
|                                                 | 2Fh                          | Used by host when writing exactly 1 data byte. Byte 5 contains data. Node replies with confirmation 60h. Only use if object 20E6.04h $\neq$ 0, otherwise use 22h.                                                                                                                                |
|                                                 | 2Bh                          | Used by host when writing exactly 2 data bytes. Byte 5 and 6 contain data. Node replies with confirmation 60h. Only use if object 20E6.04h $\neq$ 0, otherwise use 22h.                                                                                                                          |
|                                                 | 23h                          | Used by host when writing exactly 4 data bytes. Bytes 5 – 8 contain data. Node replies with confirmation 60h. Only use if object 20E6.04h $\neq$ 0, otherwise use 22h.                                                                                                                           |
| Data transfer commands                          | 60h                          | Reply from node. 60h only occurs once during the initiate write process, after that each consecutive reply to a message containing data will toggle between 20h and 30h. 20h always occurs first after 60h.                                                                                      |
|                                                 | 20h                          |                                                                                                                                                                                                                                                                                                  |
|                                                 | 30h                          |                                                                                                                                                                                                                                                                                                  |
|                                                 | 00h                          | Used by host if the nodes previous reply contained 60h or 30h in byte 1 and there is still data left to transmit.                                                                                                                                                                                |
|                                                 | 1h                           | Used by host if the nodes previous reply contained 60h or 30h in byte 1 and this message contains the last data to transfer.                                                                                                                                                                     |
|                                                 | 10h                          | Used by host if the nodes previous reply contained 20h in byte 1 and there is still data left to transmit.                                                                                                                                                                                       |
|                                                 | 11h                          | Used by host if the nodes previous reply contained 20h in byte 1 and this message contains the last data to transfer.                                                                                                                                                                            |
|                                                 | 3h, 5h, 7h, 9h, Bh, Dh       | Same as 1h except the number of bytes not containing data is specified. 3h if only the last byte contains no data, 5h if only the last two bytes do not contain data, and onwards up to Dh if the last 6 bytes do not contain data. Only use if object 20E6.04h $\neq$ 0, otherwise use 1h.      |
|                                                 | 13h, 15h, 17h, 19h, 1Bh, 1Dh | Same as 11h except the number of bytes not containing data is specified. 13h if only the last byte contains no data, 15h if only the last two bytes do not contain data, and onwards up to 1Dh if the last 6 bytes do not contain data. Only use if object 20E6.04h $\neq$ 0, otherwise use 11h. |

**SDO Abort Transfer Messages** When an error occurs during reading or writing an object, the node sends an abort transfer message to the host.

**TABLE 1.30 Node indicates error in communication.**

| Arbitration Field | Data Field |                    |                    |           |                                            |        |        |        |
|-------------------|------------|--------------------|--------------------|-----------|--------------------------------------------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2             | Byte 3             | Byte 4    | Byte 5                                     | Byte 6 | Byte 7 | Byte 8 |
| 580h + Node-ID    | 80h        | Object Index (LSB) | Object Index (MSB) | Sub-Index | See <a href="#">Table 1.31</a> (LSB first) |        |        |        |

**TABLE 1.31 Abort Code Descriptions**

| Abort Code | Description                                                                                                                               |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 0503 0000h | Toggle bit not alternated                                                                                                                 |
| 0504 0000h | SDO protocol timed out                                                                                                                    |
| 0504 0001h | Command specifier not valid                                                                                                               |
| 0504 0002h | Invalid block size (block mode only, see DS301)                                                                                           |
| 0504 0003h | Invalid sequence number (block mode only, see DS301)                                                                                      |
| 0504 0004h | CRC error (block mode only, see DS301)                                                                                                    |
| 0504 0005h | Out of memory                                                                                                                             |
| 0601 0000h | Unsupported access to an object                                                                                                           |
| 0601 0001h | Attempt to read a write only object                                                                                                       |
| 0601 0002h | Attempt to write a read only object                                                                                                       |
| 0602 0000h | Object does not exist in the object dictionary                                                                                            |
| 0604 0041h | Object cannot be mapped to the PDO                                                                                                        |
| 0604 0042h | The number and length of the objects to be mapped would exceed PDO length                                                                 |
| 0604 0043h | General parameter incompatibility reason                                                                                                  |
| 0604 0047h | General internal incompatibility in the device                                                                                            |
| 0606 0000h | Access failed due to a hardware error                                                                                                     |
| 0607 0010h | Data type does not match, length of service parameter does not match                                                                      |
| 0607 0012h | Data type does not match, length of service parameter too high                                                                            |
| 0607 0013h | Data type does not match, length of service parameter too low                                                                             |
| 0609 0011h | Sub-index does not exist                                                                                                                  |
| 0609 0030h | Value range of parameter exceeded (only for write access)                                                                                 |
| 0609 0031h | Value of parameter written too high                                                                                                       |
| 0609 0032h | Value of parameter written too low                                                                                                        |
| 0609 0036h | Maximum value is less than minimum value                                                                                                  |
| 0800 0000h | General error                                                                                                                             |
| 0800 0020h | Data cannot be transferred or stored to the application                                                                                   |
| 0800 0021h | Data cannot be transferred or stored to the application because of local control                                                          |
| 0800 0022h | Data cannot be transferred or stored to the application because of present device state*                                                  |
| 0800 0023h | Object dictionary dynamic generation fails or no object dictionary is present (object dictionary loads from file and file error occurred) |

\*May result from write access conflict with ACE. Connect to drive in Read Only mode while accessing the communications channel.

## SDO Read and Write Examples

### Expedited SDO Read Example

In this example, Size indication (object 20E6.04h) is turned off so that the drive will not indicate, in any message, how many valid bytes are contained in the message. In this case the user is responsible for knowing the message size.

**TABLE 1.32 Expedited SDO Read Example**

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                                                                                                                                                                                             |
|--------|-----------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 601    | 8               | 40 64 60 00 00 00 00 00 | Host uses 40 in the command byte (see <a href="#">Table 1.26</a> ) to read object 6064h, the 3 <sup>rd</sup> data byte is zero because this object has no sub-indices and the last 4 data bytes are don't care's when reading                                                           |
| 581    | 8               | 42 64 60 00 34 33 00 00 | Node replies with 42 because size indication is off (see <a href="#">Table 1.26</a> ) and message was received as an expedited data transfer. Bytes 5 – 8 will contain the data from the object. In this case object 6064h (Actual Position) contains 00 00 33 34h (13,108 in decimal). |

### Expedited SDO Write Example

In this example, Size indication (object 20E6.04h) is turned off so that the drive will not indicate, in any message, how many valid bytes are contained in the message. When writing data to a node, it is not required for the host to use size indications in the messages to the node. In this case the user is responsible for knowing the message size and for using the command byte 22h.

**TABLE 1.33 Expedited SDO Write Example**

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                                                                                                                                            |
|--------|-----------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 601    | 8               | 22 40 60 00 0F 00 00 00 | Host uses 22 in the command byte (see <a href="#">Table 1.29</a> ) to write object 6040h, the 3 <sup>rd</sup> data byte is zero because this object has no sub-indices. The last 4 data bytes contain the data to write to the object. |
| 581    | 8               | 60 40 60 00 00 00 00 00 | Node replies with 60 (see <a href="#">Table 1.29</a> ) indicating message was received. Bytes 1-3 contain the object index and sub-index. Bytes 4 – 7 will always be zero in this case                                                 |

### Segmented SDO Read Example

In this example, the firmware version of the drive is read from object 208D.01. Furthermore, it will be assumed that size indication (see object 20E6.04h) is turned on so that the drive will indicate, in any message that contains less than 7 data bytes, how many valid bytes are contained in the message. Node replies to each host message are shaded. When the applicable data bytes from the last 5 shaded rows is concatenated and converted to ASCII, the data reads "ABCDEFGH-1.2.3.4".

**TABLE 1.34** Segmented SDO Read Example

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                                                                                                                                                 |
|--------|-----------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 601    | 8               | 40 8D 20 01 00 00 00 00 | Host begins data transfer Initialization                                                                                                                                                                                                    |
| 581    | 8               | 41 8D 20 01 20 00 00 00 | Node replies with 41 indicating there are more than 4 bytes to transfer. Bytes 4 – 7 indicate the number of bytes necessary to transfer. In this case 20h = 32 bytes. The drive now waits for the host to begin data transfer confirmation. |
| 601    | 8               | 60 00 00 00 00 00 00 00 | Host uses 60 to confirm ready for first segment. All other bytes are zero                                                                                                                                                                   |
| 581    | 8               | 00 41 42 43 44 45 46 47 | Node responds to host with 00h and 7 data bytes.                                                                                                                                                                                            |
| 601    | 8               | 70 00 00 00 00 00 00 00 | Host uses 70 to confirm ready for next segment. All other bytes are zero                                                                                                                                                                    |
| 581    | 8               | 10 2D 31 2E 32 2E 33 2E | Node responds to host with 10h and 7 data bytes.                                                                                                                                                                                            |
| 601    | 8               | 60 00 00 00 00 00 00 00 | Host uses 60 to confirm ready for next segment. All other bytes are zero                                                                                                                                                                    |
| 581    | 8               | 00 34 00 00 00 00 00 00 | Node responds to host with 00h and 7 data bytes.                                                                                                                                                                                            |
| 601    | 8               | 70 00 00 00 00 00 00 00 | Host uses 70 to confirm ready for next segment. All other bytes are zero                                                                                                                                                                    |
| 581    | 8               | 10 00 00 00 00 00 00 00 | Node responds to host with 10h and 7 data bytes.                                                                                                                                                                                            |
| 601    | 8               | 60 00 00 00 00 00 00 00 | Host uses 60 to confirm ready for next segment. All other bytes are zero                                                                                                                                                                    |
| 581    | 8               | 07 00 00 00 00 00 00 00 | Node responds to host with 07h and 7 data bytes. The 07h indicates that the last three bytes are to be ignored.                                                                                                                             |

### Segmented SDO Write Example

In this example, Size indication (object 20E6.04h) is turned **on** so that the drive **will indicate**, in any message that contains less than 7 data bytes, how many valid bytes are contained in the message. When writing data to a node, it is not required for the host to use size indications in the messages to the node. Node replies to each host message are shaded. Data must be sent to the node according to each objects required format. See the Object dictionary for more information on writing to a specific object.

**TABLE 1.35** Segmented SDO Write Example

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                 |
|--------|-----------------|-------------------------|-------------------------------------------------------------------------------------------------------------|
| 601    | 8               | 20 0B 20 01 00 00 00 00 | Host begins data transfer Initialization                                                                    |
| 581    | 8               | 60 0B 20 01 00 00 00 00 | Node replies with 60 confirming message receipt and ready for first segment.                                |
| 601    | 8               | 00 57 69 6C 6C 20 45 6C | Host uses 00 to begin data transfer protocol. Last 7 bytes contain data.                                    |
| 581    | 8               | 20 57 69 6C 00 00 00 00 | Node responds to host with 20h. Ignore Last 7 bytes.                                                        |
| 601    | 8               | 11 6B 69 6E 73 20 45 6C | Host uses 11 to indicate "Last Segment". Any bytes that are more than an objects length will no be written. |
| 581    | 8               | 30 6B 69 6E 00 00 00 00 | Node responds to host with 30h. Ignore last 7 bytes.                                                        |

## 1.5.2 PDO Messages

PDO messages exchange information between the host and nodes without the overhead of SDO messages. PDO messages have no reply, (i.e. they are unconfirmed messages) which allows for fast, efficient data transfer of up to 8 bytes. As a result, PDOs are ideal for transferring information during device operation whereas SDOs are generally used for configuring the drive. PDO messages, unlike SDO messages, are configured prior to use. Once configured, PDO messages can be enabled or disabled according to whether or not they are needed. There are two types of PDO messages: a transmit PDO (TPDO) message and a receive PDO (RPDO) message.

**Transmit Process Data Objects (TPDO)** TPDOs are configured to send data from node to host according to a configurable trigger mechanism or when requested by an RTR. Before data is transmitted by a TPDO, it must be configured, and enabled, with the “[Communication Parameter Object](#)” related to that TPDO. TPDOs do not alter any object data; they only read and transmit data to the CAN bus. AMC CANopen drives offer ten different TPDOs (all are disabled by default). Nine have fixed pre-defined configurations and one (TPDO 26) is available for user specification.

**Receive Process Data Objects (RPDO)** The host uses RPDOs to write data to objects in one or more nodes. Before data is received by an RPDO, it must be configured, and enabled, with a “[Communication Parameter Object](#)” related to that RPDO. Since RPDOs write to object data, it is important to ensure that the data sent is in agreement with the objects mapped to the PDO (PDO object mapping is discussed below). AMC CANopen drives offer eleven different RPDOs where all are disabled by default.

**PDO Configuration** Configuration of a particular PDO is accomplished by setting the appropriate PDO “[Communication Parameter Object](#)” and PDO Mapping Parameter object “[Mapping Parameter Object](#)” for that PDO. It is the user’s responsibility to decide which of the PDOs in [Table 1.36](#) are applicable to the application and configure/enable them. As specified by DS301, the PDO Communication Parameter objects are found over the range 1400h-15FFh and 1800h-19FFh for RPDOs and TPDOs, respectively. PDO Mapping Parameter objects are specified over the range 1600h-17FFh and 1A00h-1BFFh for RPDOs and TPDOs, respectively. Although the full range allows for over 500 different RPDOs and TPDOs, only a fraction of that range is needed for AMC CANopen drives. The PDOs used by AMC CANopen drives are given in [Table 1.36](#) along with the names of objects mapped to them. Only one TPDO (26th) can be mapped; all other TPDOs and RPDOs have fixed mapping parameters.



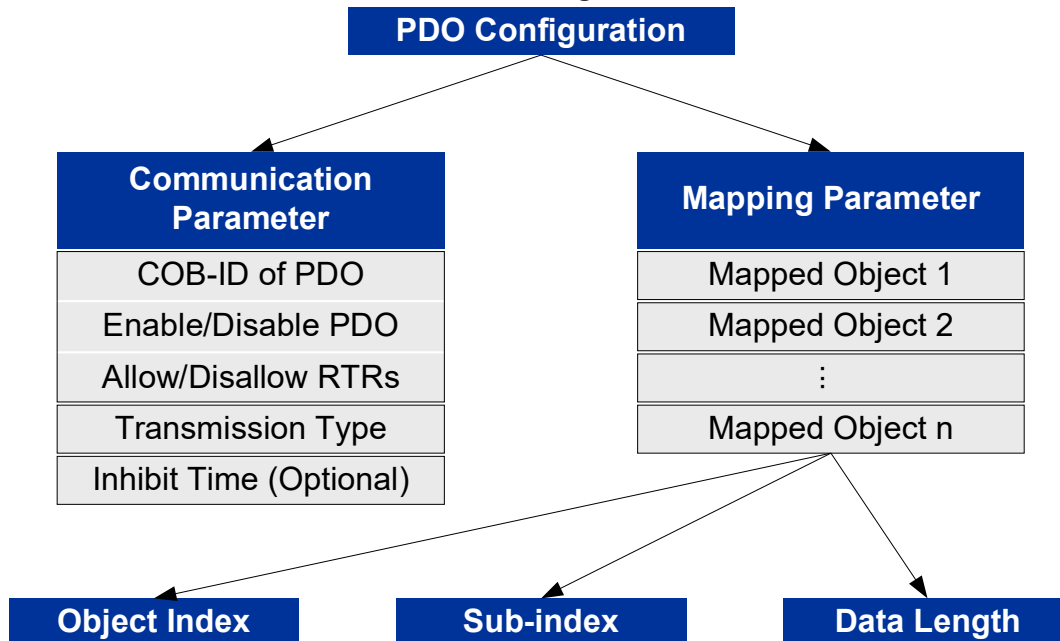
TABLE 1.36 PDO's

| PDO                    | PDO Communication Parameter | PDO Mapping Parameter | 1 <sup>st</sup> Object Mapping                                                          | 2 <sup>nd</sup> Object Mapping |
|------------------------|-----------------------------|-----------------------|-----------------------------------------------------------------------------------------|--------------------------------|
| 1 <sup>st</sup> RPDO   | 1400h                       | 1600h                 | ControlWord                                                                             | -                              |
| 2 <sup>nd</sup> RPDO   | 1401h                       | 1601h                 | ControlWord                                                                             | Modes of Operation             |
| 3 <sup>rd</sup> RPDO   | 1402h                       | 1602h                 | ControlWord                                                                             | Target Position                |
| 4 <sup>th</sup> RPDO   | 1403h                       | 1603h                 | ControlWord                                                                             | Target Velocity                |
| 5 <sup>th</sup> RPDO   | 1404h                       | 1604h                 | ControlWord                                                                             | Target Current                 |
| 21 <sup>st</sup> RPDO  | 1414h                       | 1614h                 | Target Position                                                                         | -                              |
| 22 <sup>nd</sup> RPDO  | 1415h                       | 1615h                 | Target Velocity                                                                         | -                              |
| 23 <sup>rd</sup> RPDO  | 1416h                       | 1616h                 | Target Current                                                                          | -                              |
| 24 <sup>th</sup> RPDO  | 1417h                       | 1617h                 | PVT Buffer                                                                              | -                              |
| 27 <sup>th</sup> RPDO* | 1420h                       | 1620h                 | Command Limiter Velocity                                                                | -                              |
| 28 <sup>th</sup> RPDO* | 1421h                       | 1621h                 | Command Limiter Accel                                                                   | Command Limiter Decel          |
| 1 <sup>st</sup> TPDO   | 1800h                       | 1A00h                 | StatusWord                                                                              | -                              |
| 3 <sup>rd</sup> TPDO   | 1802h                       | 1A02h                 | StatusWord                                                                              | Actual Position                |
| 4 <sup>th</sup> TPDO   | 1803h                       | 1A03h                 | StatusWord                                                                              | Actual Velocity                |
| 5 <sup>th</sup> TPDO   | 1804h                       | 1A04h                 | StatusWord                                                                              | Actual Current                 |
| 21 <sup>st</sup> TPDO  | 1814h                       | 1A14h                 | Actual Position                                                                         | -                              |
| 22 <sup>nd</sup> TPDO  | 1815h                       | 1A15h                 | Actual Velocity                                                                         | -                              |
| 23 <sup>rd</sup> TPDO  | 1816h                       | 1A16h                 | Actual Current                                                                          | -                              |
| 24 <sup>th</sup> TPDO  | 1817h                       | 1A17h                 | PVT Buffer Position                                                                     | -                              |
| 25 <sup>th</sup> TPDO  | 1818h                       | 1A18h                 | Prog. Digital Inputs                                                                    | -                              |
| 26 <sup>th</sup> TPDO  | 1819h                       | 1A19h                 | Configurable. Contains 8 locations available for mapping objects. (See 1A19.01-1A19.08) |                                |

\*RPDO 27 and RPDO 28 are not supported in the following firmware: DPCANTA.ABS, DPCANTA.SIN, DPCANIA.ABS, DPCANIA.SIN.

The relationship between a PDO Mapping parameter and Communication parameter is illustrated in [Figure 1.4](#). The fact that PDO parameter objects are configured prior to any PDO messages being sent is what allows for all eight bytes of the PDO message to be used for data. The overall result is faster, more efficient data transfer and no additional bus usage for confirmation.

FIGURE 1.4 PDO Configuration Parameters



**Communication Parameter Object** The Communication Parameter object contains information regarding the COB-ID and transmission type of the PDO. The COB-ID and other settings are stored in sub-index 01h while the transmission type is stored in sub-index 02h. For example, the COB-ID of the 1<sup>st</sup> TPDO would be found at sub-index 1800.01h while the transmission type would be defined by sub-index 1800.02h. The details of choosing a COB-ID and setting the transmission type are explained below.

### Setting COB-ID's for each PDO

A unique COB-ID (unique with respect to the entire CANopen network, not just the node) must be assigned to each PDO which will be used over the CAN network. It is the system designer's responsibility to ensure that all PDOs have a unique COB-ID. It is best to assign the COB-IDs in a logical order, with the most important PDOs assigned to the lowest COB-IDs. The range of possible values is 181h-57Fh.

Sub-index 01h of each PDO's Communication Parameter object contains the COB-ID and is a 32-bit data field partitioned into five components as shown in [Table 1.37](#). [Table 1.38](#) summarizes how these partitions are defined and [Table 1.36](#) lists the object index for each PDO's Communication Parameter object.

TABLE 1.37 PDO COB-ID structure

| Bit 31 | Bit 30 | Bit 29 | Bits 28 – 11         | Bits 10 – 0 |
|--------|--------|--------|----------------------|-------------|
| 0/1    | 0/1    | 0      | 00000000000000000000 | COB-ID      |

**TABLE 1.38 COB-ID bit definitions**

| Bit Number | Value             | Description                                                                                                                                                                                                     |
|------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 31(msb)    | 0                 | PDO message is enabled and will respond to the assigned trigger mechanism.                                                                                                                                      |
|            | 1                 | PDO message is disabled and will not respond to the assigned trigger mechanism. This is the default state for all PDOs.                                                                                         |
| 30         | 0                 | RTR allowed on this PDO.                                                                                                                                                                                        |
|            | 1                 | No RTR allowed on this PDO.                                                                                                                                                                                     |
| 29         | 0                 | Use 0 for AMC drives (selects CAN 2.0A).                                                                                                                                                                        |
| 28-11      | 0                 | Use 0 for AMC drives (non-zero values reserved for CAN 2.0B).                                                                                                                                                   |
| 10-0 (lsb) | 11-bit Identifier | Holds the 11-bit identifier (COB-ID) of the PDO. Use the default value or set-up the priority for each PDO by setting this value closer to the value 181h, which has the highest PDO priority on a CAN network. |

### Transmission Type

Sub-index 02h of each PDO's Communication Parameter object is an 8-bit data field that defines the transmission type. Setting the value of this sub-index to an appropriate value, as given in [Table 1.39](#), sets the transmission type. Note that there is a range of valid values for some transmission types. The "asynchronous" transmission type, for example, is set using a value of 254 or 255 (FEh or FFh).

**TABLE 1.39 PDO Transmission Type selection table**

| PDO Transmission Description |                     |                                                                                                                                                                                                                                                          |                                                                                                              |
|------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Value                        | Transmission Type   | TPDO                                                                                                                                                                                                                                                     | RPDO                                                                                                         |
| 00h                          | Synchronous Acyclic | PDO is transmitted on the next Sync message following an internal event. In addition, the PDO can be transmitted immediately following an RTR request.                                                                                                   | The received data is held until the next Sync message. When the Sync message is received the data is applied |
| 01h – F0h                    | Synchronous Cyclic  | PDO's are transmitted with relation to the Sync object. The number (01h-F0h) represents the number of Sync pulses between consecutive PDO transmissions. In addition, the PDO can be transmitted immediately following an RTR request or internal event. |                                                                                                              |
| F1h - FBh                    | N/A                 | Reserved                                                                                                                                                                                                                                                 | Reserved                                                                                                     |
| FCh                          | Synchronous RTR     | PDO's are only transmitted following the first Sync message after a remote request or immediately following an internal event.                                                                                                                           | Reserved                                                                                                     |
| FDh                          | Asynchronous        | PDO's are transmitted immediately following an internal event or RTR request.                                                                                                                                                                            | Reserved                                                                                                     |
| FEh - FFh                    |                     |                                                                                                                                                                                                                                                          | The received data is applied to its mapped objects immediately                                               |

**Mapping Parameter Object** The mapping parameter object contains information about each object mapped to a PDO. Each object that is mapped is represented by a sub-index in the Mapping Parameter object. So if, for example, a PDO has  $n$  number of mapped objects then the PDO's mapping parameter object will have sub-indices 1 through  $n$ . Each sub-index contains a 32-bit field partitioned into 3 components as shown in [Table 1.40](#).

**TABLE 1.40 Mapping Parameter bit descriptions**

| Bits 31 – 16 | Bits 15 – 8 | Bits 7 – 0    |
|--------------|-------------|---------------|
| Index        | Sub Index   | Object Length |

The three components that represent a mapped object are described below:

- **Index:** The index of the object mapped to the PDO (zero if no object is mapped).
- **Sub-index:** The sub-index of the mapped object and the location of the data to be transmitted (zero if the object has no sub-indices).
- **Object Length:** The bit length (in hex) of the data to be transmitted. For example, 20h = 32 bits.

By placing information about an object in the Mapping Parameter, that object becomes mapped to the associated PDO. Mapping allows PDOs to know where they should read their data prior to transmission (in the case of TPDOs) or where they should write their data upon reception (in the case of RPDOs). Although DS301 allows up to 64 objects to be mapped to a single PDO, the number that can actually be mapped is ultimately determined by the total amount of the data mapped to the PDO. If, for example, a single object with an 8-byte (64-bit) data length is mapped to a PDO, then no other objects can be mapped to that same PDO since all 8-bytes of the data field will already be consumed. Mapped data is inserted into the data field of the PDO according to the order of mapping. That is, the data from the first mapped object consumes the first available byte (or bytes), and then data from the second mapped object consumes the next available byte (or bytes), and so on until all data bytes have been consumed or there is no more object data to map.

**RTR bit and TPDOs** Once a PDO has been configured and enabled, the host can use the RTR bit to request a TPDO from a node. This supplies the host with a fast and efficient on-demand method of retrieving information from a node. To request a TPDO, the host must send a message with the RTR bit set to 1 and a COB-ID that corresponds to the desired TPDO.

**AMC PDO Assignment and Mapping** AMC CANopen drives support 11 RPDOs and 10 TPDOs, all of which can be assigned to a user-specified COB-ID. All 11 RPDOs are mapped to fixed, pre-defined objects and, as a result, only the Communication Parameter of an RPDO can be changed.

Similarly, all TPDOs, with the exception of TPDO 26, are mapped to fixed pre-defined objects and, again, only their Communication Parameters can be changed. The single exception, TPDO 26, is available for mapping up to 8 user specified application objects. All TPDOs can be assigned user-specified trigger mechanisms based on either timing or object data changes as explained in the following section. Some TPDOs, however, have fixed predefined trigger mechanisms. To know if a TPDO has a predefined trigger, check the description of that TPDO in the Object Dictionary.

**AMC Asynchronous Transmission Events** AMC CANopen drives support 3 basic asynchronous event types:

- **Time based:** the drive transmits the selected TPDOs when a certain amount of time has elapsed. There are 2 internal timer objects available. Any of the TPDOs can be mapped to either or both timers.
- **Value based:** the drive monitors a certain object (presumably of a numerical type), and when the object has changed by a certain amount, the selected TPDOs will be transmitted. Two value counters exist, one watches for the mapped object to change by a specified amount, the other watches for the mapped object to reach a specific value. Any of the TPDOs can be mapped to either or both of the Value Counters.

- Bit based: the drive monitors a certain object (presumably of a bit-pattern type), and when a bit in that object changes (from 0 to 1 or 1 to 0), the selected TPDOs will be transmitted. Any of the TPDOs can be mapped to either or both of the Bit Watch processes.

The objects used to configure these asynchronous events, as well as some objects supplied for reading information about these events, are summarized in [Table 1.41](#).

**TABLE 1.41 Asynchronous TPDO Transmission Events**

| Event Type  | Event         | Object Name                          | Object Index | Object Type   |
|-------------|---------------|--------------------------------------|--------------|---------------|
| Time Based  | Timer1        | TPDO Timer1 Cycle Time               | 2120h        | Configurable  |
|             |               | TPDO Timer1 Assigned TPDOs           | 2121h        | Configurable  |
|             |               | TPDO Timer1 Next Processing Time     | 2122h        | Informational |
|             | Timer2        | TPDO Timer2 Cycle Time               | 2123h        | Configurable  |
|             |               | TPDO Timer2 Assigned TPDOs           | 2124h        | Configurable  |
|             |               | TPDO Timer2 Next Processing Time     | 2125h        | Informational |
| Value Based | Value-Changed | TPDO Value-Changed Object ID         | 2130h        | Configurable  |
|             |               | TPDO Value-Changed Delta Value       | 2131h        | Configurable  |
|             |               | TPDO Value-Changed Assigned TPDOs    | 2132h        | Configurable  |
|             |               | TPDO Value-Changed Object Last Value | 2133h        | Informational |
|             | Value-Reached | TPDO Value-Reached Object ID         | 2150h        | Configurable  |
|             |               | TPDO Value-Reached                   | 2151h        | Configurable  |
|             |               | TPDO Value-Reached Assigned TPDOs    | 2152h        | Configurable  |
|             |               | TPDO Value-Reached Direction         | 2153h        | Configurable  |
| Bit Based   | Bits-Changed1 | TPDO Bits-Changed1 Object ID         | 2140h        | Configurable  |
|             |               | TPDO Bits-Changed1 Object Bit Mask   | 2141h        | Configurable  |
|             |               | TPDO Bits-Changed1 Assigned TPDOs    | 2142h        | Configurable  |
|             |               | TPDO Bits-Changed1 Object Last Value | 2143h        | Informational |
|             | Bits-Changed2 | TPDO Bits-Changed2 Object ID         | 2144h        | Configurable  |
|             |               | TPDO Bits-Changed2 Object Bit Mask   | 2145h        | Configurable  |
|             |               | TPDO Bits-Changed2 Assigned TPDOs    | 2146h        | Configurable  |
|             |               | TPDO Bits-Changed2 Object Last Value | 2147h        | Informational |

Please refer to the Object Dictionary section for more details on these objects.

## PDO Message Examples

### PDO Configuration Example

This example demonstrates using expedited SDO messages to configure two PDOs (there is no need to use segmented SDO's in this case because data is less than 4 bytes). Each PDO is enabled, assigned a COB-ID, and the trigger mechanisms set to an arbitrary mechanism.

**TABLE 1.42 PDO Configuration Example**

| COB-ID | Number of Bytes | Message / Data          | Description                                                                                                                                    |
|--------|-----------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 601    | 8               | 22 01 14 01 81 01 00 00 | Writing COB-ID 181 to 2 <sup>nd</sup> RPDO (1401.01). Setting bit 32 here to 0 enables the PDO to be processed                                 |
| 601    | 8               | 22 01 14 02 FE 00 00 00 | Setting trigger mechanism of 2 <sup>nd</sup> RPDO (1401.02) to respond Immediately upon receipt of data. (See <a href="#">Table 1.39</a> )     |
| 601    | 8               | 22 14 18 01 85 01 00 00 | Writing COB-ID 185 to 21 <sup>st</sup> TPDO (1814.01) Setting bit 32 here to 0 enables the PDO to be processed                                 |
| 601    | 8               | 22 14 18 02 01 00 00 00 | Setting trigger mechanism of 21 <sup>st</sup> TPDO (1814.01) to respond only upon receipt of a SYNC message. (See <a href="#">Table 1.39</a> ) |
| 000    | 2               | 01 01                   | Sending NMT message to start node 1 communication state machine so that PDO messages may be processed.                                         |
| 181    | 4               | 06 00 01 00             | Using 2 <sup>nd</sup> RPDO to set the drive into Profile Position Mode and the Shutdown control state                                          |
| 181    | 4               | 07 00 01 00             | Using 2 <sup>nd</sup> RPDO to keep the drive in Profile Position Mode and set the Operation Disabled control state                             |
| 181    | 4               | 0F 00 01 00             | Using 2 <sup>nd</sup> RPDO to keep the drive in Profile Position Mode and set the Operational Enabled control state                            |
| 80     | 1               | 00                      | Start sending SYNC messages to cause the SYNC triggered TPDOs to send data to the host.                                                        |
| 185    |                 | FF FF FF FF             | 21 <sup>st</sup> TPDO response to SYNC message containing actual position = -1 counts                                                          |
| 80     | 1               | 00                      | Next SYNC message from host                                                                                                                    |
| 185    |                 | 02 00 00 00             | 21 <sup>st</sup> TPDO response to SYNC message containing actual position = 2 counts                                                           |
| 80     | 1               | 00                      | Next SYNC message from host                                                                                                                    |
| 185    |                 | 05 00 00 00             | 21 <sup>st</sup> TPDO response to SYNC message containing actual position = 5 counts                                                           |

### Asynchronous TPDO Transmission Example # 1

This example sets the timer1 event to 1000ms and assigns three TPDOs to transmit on every timer1 event. Prior to this example TPDOs have been assigned valid COB-IDs and are enabled.

**TABLE 1.43 Asynchronous TPDO Transmission Example #1**

| COB-ID       | Number of Bytes | Message / Data          | Description                                                                                             |
|--------------|-----------------|-------------------------|---------------------------------------------------------------------------------------------------------|
| 000          | 2               | 01 01                   | Sending NMT message to start node 1 communication state machine so that PDO messages may be processed.  |
| 601          | 8               | 22 20 21 00 E8 03 00 00 | Writing 1000 to object 2120.00. This sets the event timer to 1s intervals                               |
| 601          | 8               | 22 21 21 00 23 00 00 00 | Writing to bit-mask such that TPDOs 1, 3, and 22 are assigned to transmit according to the timer object |
| Wait 1000 ms |                 |                         |                                                                                                         |
| 181          | 2               | 21 06                   | 1 <sup>st</sup> TPDO transmits after 1 second with it's data                                            |
| 281          | 6               | 21 06 FE FF FF FF       | 3 <sup>rd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                |
| 2C1          | 4               | 00 00 00 00             | 22 <sup>nd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                               |
| 601          | 8               | 40 22 21 00 00 00 00 00 | Host sends SDO message to read 2122.00 for next timer1 event occurrence.                                |
| 581          | 8               | 42 22 21 00 B2 ED 97 02 | Node indicates next event occurs at 43511218 ms                                                         |
| Wait 1000 ms |                 |                         |                                                                                                         |
| 181          | 2               | 21 06                   | 1 <sup>st</sup> TPDO transmits after 1 second with it's data                                            |
| 281          | 6               | 21 06 FE FF FF FF       | 3 <sup>rd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                |
| 2C1          | 4               | 00 00 00 00             | 22 <sup>nd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                               |
| 601          | 8               | 40 22 21 00 00 00 00 00 | Host sends SDO message to read 2122.00 for next timer1 event occurrence.                                |
| 581          | 8               | 42 22 21 00 B2 ED 97 02 | Node indicates next event occurs at 43512218 ms                                                         |
| ...          |                 |                         |                                                                                                         |
| 601          | 8               | 22 21 21 00 00 00 00 00 | Host writes to bit-mask such that no TPDOs are assigned to transmit. This stops the Timer1 event.       |

### Asynchronous TPDO Transmission Example # 2

This example uses the bit based transmission events to monitor specific bits in the Actual Position object (6064h). Prior to this example TPDOs have been assigned valid COB-IDs and are enabled

**TABLE 1.44 Asynchronous TPDO Transmission Example #2**

| COB-ID                    | Number of Bytes | Message / Data          | Description                                                                                                             |
|---------------------------|-----------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 000                       | 2               | 01 01                   | Sending NMT message to start node 1 communication state machine so that PDO messages may be processed                   |
| 601                       | 8               | 22 40 21 00 00 64 60 00 | Writing 60 64 00 to object 2140.00. This sets the Bit-Watch1 event to monitor object 6064h. Byte 8 is always 00         |
| 601                       | 8               | 22 41 21 00 00 02 00 00 | Writing the exact bits to watch such that TPDOs will transmit when these/ this bit changes. This example watches bit 10 |
| 601                       | 8               | 22 42 21 00 23 00 00 00 | Writing the Bit-mask to assign TPDOs 1, 3, and 22 to transmit on the bit change event                                   |
| Wait until Bit 10 toggles |                 |                         |                                                                                                                         |
| 181                       | 2               | 21 06                   | 1 <sup>st</sup> TPDO transmits after bit 10 toggle                                                                      |
| 281                       | 6               | 21 06 FE FF FF FF       | 3 <sup>rd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                                |
| 2C1                       | 4               | 00 00 00 00             | 22 <sup>nd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                               |
| 601                       | 8               | 40 43 21 00 00 00 00 00 | Host sends SDO message to read 2143.00 for last value of monitored object. This is optional                             |
| 581                       | 8               | 42 22 21 00 FE FF FF FF | Node indicates the last value contained -2                                                                              |
| Wait until Bit 10 toggles |                 |                         |                                                                                                                         |
| 181                       | 2               | 21 02                   | 1 <sup>st</sup> TPDO transmits after bit 10 toggle                                                                      |
| 281                       | 6               | 21 02 00 00 00 00       | 3 <sup>rd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                                |
| 2C1                       | 4               | 4D 34 00 00             | 22 <sup>nd</sup> TPDO transmits the same time as the 1 <sup>st</sup> TPDO                                               |
| 601                       | 8               | 40 43 21 00 00 00 00 00 | Host sends SDO message to read 2143.00 for last value of monitored object. This is optional                             |
| 581                       | 8               | 42 22 21 00 00 00 00 00 | Node indicates the last value contained 0                                                                               |
| ...                       |                 |                         |                                                                                                                         |
| 601                       | 8               | 22 42 21 00 00 00 00 00 | Host writes to bit-mask such that no TPDOs are assigned to transmit. This stops the Bit-Watch1 event                    |

**PDO Mappable Objects** Only a subset of objects in the object dictionary may be mapped to TPDO 26. [Table 1.45](#) lists all PDO mappable objects. Data exchange with objects not listed in the table require an SDO.

**TABLE 1.45 PDO Mappable Objects**

| Type            | Object Index | Sub-Index | Object Name     | Mapping Access | PDO Allocation (bits) |
|-----------------|--------------|-----------|-----------------|----------------|-----------------------|
| Drive Operation | 2001         | 03        | User Bits       | TPDO           | 16                    |
|                 | 6040         | 00        | ControlWord     | TPDO           | 16                    |
| Command Objects | 6071         | 00        | Target Current  | TPDO           | 16                    |
|                 | 607A         | 00        | Target Position | TPDO           | 32                    |
|                 | 60B1         | 00        | Velocity Offset | TPDO           | 32                    |
|                 | 60B2         | 00        | Torque Offset   | TPDO           | 16                    |



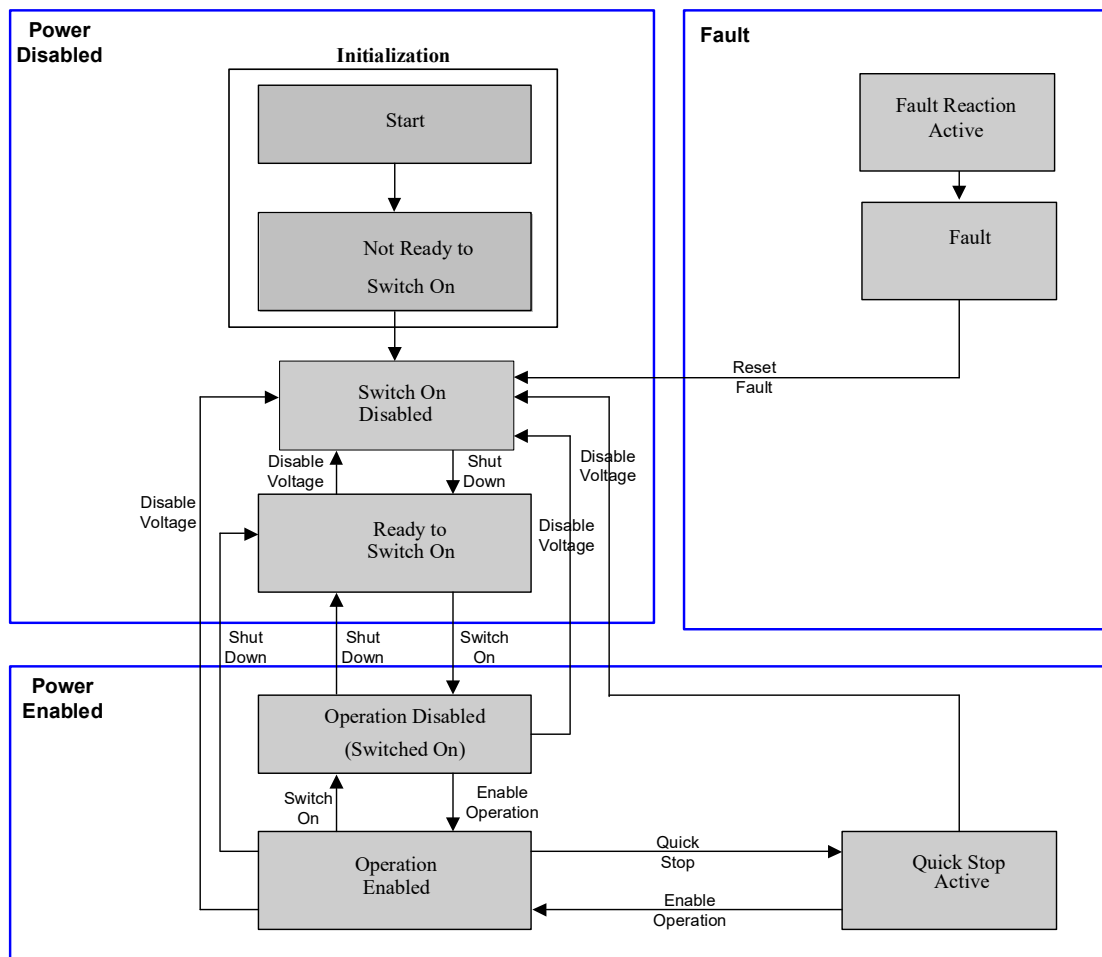
|                 |      |    |                                  |      |    |
|-----------------|------|----|----------------------------------|------|----|
| Command Objects | 60FF | 00 | Target Velocity                  | TPDO | 32 |
| Monitor Objects | 2002 | 01 | Drive Bridge Status              | TPDO | 16 |
|                 | 2002 | 02 | Drive Protection Status          | TPDO | 16 |
|                 | 2002 | 03 | System Protection Status         | TPDO | 16 |
|                 | 2002 | 04 | Drive/System Status 1            | TPDO | 16 |
|                 | 2002 | 05 | Drive/System Status 2            | TPDO | 16 |
|                 | 2002 | 06 | Drive/System Status 3            | TPDO | 16 |
|                 | 2002 | 07 | Active Configuration Status      | TPDO | 16 |
|                 | 2003 | 01 | Drive Bridge Status History      | TPDO | 16 |
|                 | 2003 | 02 | Drive Protection Status History  | TPDO | 16 |
|                 | 2003 | 03 | System Protection Status History | TPDO | 16 |
|                 | 2003 | 04 | Drive/System Status 1 History    | TPDO | 16 |
|                 | 2003 | 05 | Drive/System Status 2 History    | TPDO | 16 |
|                 | 2003 | 06 | Drive/System Status 3 History    | TPDO | 16 |
|                 | 200F | 01 | DC Bus Voltage                   | TPDO | 16 |
|                 | 2010 | 02 | Current Demand - Torque          | TPDO | 16 |
|                 | 2010 | 12 | Torque Summation Input           | TPDO | 32 |
|                 | 2010 | 13 | Torque Summation Offset          | TPDO | 32 |
|                 | 2011 | 05 | Velocity Error                   | TPDO | 32 |
|                 | 2011 | 06 | Velocity Summation Input         | TPDO | 32 |
|                 | 2011 | 07 | Velocity Summation Offset        | TPDO | 32 |
|                 | 2012 | 03 | Position Demand                  | TPDO | 32 |
|                 | 2012 | 05 | Position Summation Input         | TPDO | 32 |
|                 | 2012 | 06 | Position Summation Offset        | TPDO | 32 |
|                 | 2012 | 07 | Position Index Capture Value     | TPDO | 32 |
|                 | 2018 | 01 | PLS Input Value                  | TPDO | 32 |
|                 | 2018 | 02 | PLS 1 State                      | TPDO | 32 |
|                 | 2018 | 03 | PLS 2 State                      | TPDO | 32 |
|                 | 201A | 02 | Analog Input 1 Raw ADC Value     | TPDO | 16 |
|                 | 201A | 06 | Analog Input 2 Raw ADC Value     | TPDO | 16 |
|                 | 201A | 0A | Analog Input 3 Raw ADC Value     | TPDO | 16 |
|                 | 201A | 0E | Analog Input 4 Raw ADC Value     | TPDO | 16 |
|                 | 201D | 01 | PVT Status Values                | TPDO | 16 |
|                 | 2021 | 01 | External Thermal Sense Value     | TPDO | 32 |
|                 | 2021 | 02 | Thermistor Resistance            | TPDO | 16 |
|                 | 2023 | 01 | Digital Input Values             | TPDO | 16 |
|                 | 2025 | 01 | Analog Output 1 Value            | TPDO | 16 |
|                 | 2025 | 02 | Analog Output 2 Value            | TPDO | 16 |
|                 | 6041 | 00 | Status Word                      | TPDO | 16 |
|                 | 6061 | 00 | Modes of Operation Display       | TPDO | 16 |
|                 | 6064 | 00 | Actual Position                  | TPDO | 32 |
| Monitor Objects | 606B | 00 | Velocity Demand                  | TPDO | 32 |
|                 | 606C | 00 | Actual Velocity                  | TPDO | 32 |
|                 | 6077 | 00 | Actual Current                   | TPDO | 16 |
|                 | 60F4 | 00 | Position Error                   | TPDO | 32 |

## 1.6 Control State Machine

### 1.6.1 State Machine Overview

CANopen drives operate based on a control state machine where each state has a defined behavior. The drive can be controlled to transition from one state to another in a particular order using the ControlWord object (6040h). This is a write only object used specifically to transition the drive's control state machine between states. Below is a graphical overview of the state machine. The grey boxes represent the states. The arrows represent the one-way path between states. The small text along the path of the arrow represents the command necessary to make each transition.

**FIGURE 1.5 ControlWord State Machine Block Diagram**



Upon power-up, the drive will automatically step through the 'Start' and 'Not Ready to Switch On' states, arriving at the 'Switch On Disabled' state. Further advancement to other states is accomplished by setting the ControlWord (Object index 6040h) to the proper value. The commands that cause the state transitions in the state machine correspond to certain bit

settings within the ControlWord. For example, to transfer from the 'Ready to Switch On' state to the 'Switched On State', one would use the Switch On command, by setting the ControlWord to the appropriate value (and hence bit pattern). The drive state may be queried by using StatusWord (Object index 6041h). If the drive senses a fault, it will automatically move into the Fault Reaction Active state, then transition to the Fault state. The ControlWord can once again be used to move from the Fault state to the Switch On Disabled state.

## 1.6.2 Drive States

The following tables provide details on each of the CANopen states supported by AMC drives.

**TABLE 1.46**

| Not Ready to Switch On |                                                                                                                               |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Function               | Part of drive initialization                                                                                                  |
| Status                 | Logic Supply has been applied to the drive. The drive is being initialized. Drive functionality is disabled during this time. |
| Transitions            | Transition to 'Switch On Disabled' is automatic when initialization complete.                                                 |

**TABLE 1.47**

| Switch On Disabled |                                                                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Function           | Drive initialization is complete. If a fatal error exists, the processor executes a Reset Fault command automatically. The drive is still disabled. |
| Status             | Drive parameters have been set up. Only logic supply voltage is necessary at this time. Drive process monitoring may begin.                         |
| Transitions        | Transition to the <b>Ready to Switch On</b> state is possible by a <i>Shut Down</i> command.                                                        |

**TABLE 1.48**

| Ready to Switch On |                                                                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function           | Last state before Bridge enabled                                                                                                                                                                                                                        |
| Status             | No energy is supplied to the motor. Control loops do not work. The drive function is still disabled. Bus power may be applied.                                                                                                                          |
| Transitions        | Transition to <b>Operation Disabled (Switched ON)</b> state is possible via the <i>Switch On</i> command. Transition back to the <b>Switch On Disabled</b> state is possible via the <i>Disable Voltage</i> command, or by a <i>Quick Stop</i> command. |

**TABLE 1.49**

| Operation Disabled (Switched On) |                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function                         | The bridge is turned on and a mode-dependent zero command is issued.                                                                                                                                                                                                                                                                                             |
| Status                           | The control loops are operational. Bus power is applied. The power section is switched on (if not already on). The target signal is not processed. The drive function is disabled.                                                                                                                                                                               |
| Transitions                      | Transition to the <b>Operation Enabled</b> state is possible via the <i>Enable Operation</i> command. Transition back to the <b>Ready to Switch On</b> state is equally possible via the <i>Shut Down</i> command. Transition back to the <b>Switch On Disabled</b> state is possible via the <i>Disable Voltage</i> command or via a <i>Quick Stop</i> command. |

TABLE 1.50

| Operation Enabled |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function          | This is the normal operation state of the drive.                                                                                                                                                                                                                                                                                                                                                                                              |
| Status            | Power is supplied to the motor. Control loops are operational and target signals are processed.                                                                                                                                                                                                                                                                                                                                               |
| Transitions       | A <i>Quick Stop</i> command transfers the drive to the <b>Quick Stop Active</b> state. Transition back to the <b>Ready to Switch On</b> state is possible via the <i>Shut Down</i> command. Transition back to the <b>Switch On Disabled</b> state is possible via the <i>Disable Voltage</i> command or the <i>Drive Enable Input</i> . Transition back to the <b>Operation Disabled</b> state is possible via the <i>Switch On</i> command. |

TABLE 1.51

| Quick Stop Active |                                                                                                                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function          | The motor (shaft) is brought to a stop using the Stop Deceleration Limit.                                                                                                                                                                                                                                  |
| Status            | Control loops are operational. Power is applied to the motor. The motor shaft is held in position in position mode or zero velocity in velocity mode.                                                                                                                                                      |
| Transitions       | Transition back to the Operation Enabled state is possible via the <i>Enable Operation (7)</i> command. Transition back to the Switch On Disabled state is possible via the <i>Disable Voltage (4)</i> command, or via the <i>Drive Enable Input (2)</i> (both include the "Power Disable Delay" process). |

TABLE 1.52

| Fault Reaction Active |                                                                                                                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function              | The event reaction for the incident fault state will occur.                                                                                                                                |
| Status                | Power is supplied to the motor. Control loops are operational and target signals are processed.                                                                                            |
| Transitions           | Fault Reaction Active will automatically transition to the Fault state. Time in Fault Reaction Active state is dependent on background tasks, but could be anywhere between 100µs and 2ms. |

TABLE 1.53

| Fault       |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Function    | A fault has occurred and has not yet been reset                                            |
| Status      | The power output stage is disabled; no energy is supplied to the motor.                    |
| Transitions | Transition to the Switch On Disabled state is possible via the <i>Reset Fault</i> command. |

### 1.6.3 ControlWord (6040h)

The following table shows the values used with object 6040h to cause transitions shown in [Figure 1.5](#) above. An example hexadecimal value is provided on the right.

**TABLE 1.54 ControlWord values**

| State Transition Command           | Bit 7 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Example Value |
|------------------------------------|-------|-------|-------|-------|-------|-------|---------------|
| Reset Fault                        | 0→1   | X     | X     | X     | X     | X     | XX 80         |
| Disable Voltage                    | 0     | X     | X     | X     | 0     | X     | XX 00         |
| Shutdown                           | 0     | X     | X     | 1     | 1     | 0     | XX 06         |
| Switch On                          | 0     | X     | 0     | 1     | 1     | 1     | XX 07         |
| Enable Operation                   | 0     | X     | 1     | 1     | 1     | 1     | XX 0F         |
| Quick Stop                         | 0     | X     | X     | 0     | 1     | X     | XX 02         |
| Begin Homing<br>(Homing mode only) | 0     | 1     | 1     | 1     | 1     | 1     | XX 1F         |
| End Homing<br>(Homing mode only)   | 0     | 0     | 1     | 1     | 1     | 1     | XX 0F         |
| 0 = OFF, 1 = ON, X = don't care    |       |       |       |       |       |       |               |

**TABLE 1.55 Additional ControlWord values**

| State Transition Command                 | Bit 13 | Bit 12 | Description                                                   |
|------------------------------------------|--------|--------|---------------------------------------------------------------|
| Inhibit Negative Motion                  | X      | 1      | enable commanded * [negative stop OR negative torque inhibit] |
| Inhibit Positive Motion                  | 1      | X      | enable commanded * [positive stop OR positive torque inhibit] |
| 0 = disable, 1 = enable, X = don't care, |        |        | * see Event Action Configuration command (2065h)              |

For additional information on object 6040h, see [“6040h: ControlWord”](#) on page 279.

## 1.6.4 StatusWord (6041h)

The StatusWord reports exactly which state the drive is in. [Table 1.56](#) defines each bit in the StatusWord and [Table 1.57](#) shows how to interpret what state the drive is in via the combination of bits 0-3, 5 and 6. Each drive state is described in detail in “[Drive States](#)”.

**TABLE 1.56 StatusWord bit descriptions**

| Bits | Name                  | Descriptions                                                                                                                                                                                                                                       |
|------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0    | Ready to Switch On    | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine.                                                                                                                                                           |
| 1    | Switched On           | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine                                                                                                                                                            |
| 2    | Operation Enabled     | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine                                                                                                                                                            |
| 3    | Fault                 | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine                                                                                                                                                            |
| 4    | Voltage Enabled       | 1 when power is applied to the motor                                                                                                                                                                                                               |
| 5    | Quick Stop            | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine                                                                                                                                                            |
| 6    | Switch On disabled    | See <a href="#">Table 1.57</a> to see how this bit relates to the control state machine                                                                                                                                                            |
| 7    | Warning               | Object 205B can be used to configure which internal drive events will set this bit.                                                                                                                                                                |
| 8    | Manufacture specific  | Object 205B can be used to configure which internal drive events will set this bit.                                                                                                                                                                |
| 9    | Remote                | 0 when read/write access has been seized by the service channel (i.e. configuration software).<br>1 when control over the network is allowed.                                                                                                      |
| 10   | Target Reached        | 1 Under the following conditions:<br>- Home reached if the CAN operational-mode is homing.<br>- Home reached if the CAN operational-mode is custom and homing is active.<br>- End of motion in PVT mode.<br>- At command for all other conditions. |
| 11   | Internal Limit Active | Object 205B can be used to configure which internal drive events will set this bit.                                                                                                                                                                |
| 12   | Homing complete       | 1 when Homing completes, otherwise 0.                                                                                                                                                                                                              |
| 13   | -                     | -                                                                                                                                                                                                                                                  |
| 14   | -                     | -                                                                                                                                                                                                                                                  |
| 15   | -                     | -                                                                                                                                                                                                                                                  |

**TABLE 1.57 StatusWord drive states**

| Drive State            | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | StatusWord          |
|------------------------|-------|-------|-------|-------|-------|-------|-------|---------------------|
| Not Ready to Switch On | 0     | X     | X     | 0     | 0     | 0     | 0     | xxxx xxxx x0xx 0000 |
| Switch On Disabled     | 1     | X     | X     | 0     | 0     | 0     | 0     | xxxx xxxx x1xx 0000 |
| Ready to Switch On     | 0     | 1     | X     | 0     | 0     | 0     | 1     | xxxx xxxx x01x 0001 |
| Switched On            | 0     | 1     | X     | 0     | 0     | 1     | 1     | xxxx xxxx x01x 0011 |
| Operation Enabled      | 0     | 1     | X     | 0     | 1     | 1     | 1     | xxxx xxxx x01x 0111 |
| Fault Reaction Active  | 0     | X     | X     | 1     | 1     | 1     | 1     | xxxx xxxx x0xx 1111 |
| Fault                  | 0     | X     | X     | 1     | 0     | 0     | 0     | xxxx xxxx x0xx 1000 |
| Quick Stop Active      | 0     | 0     | X     | 0     | 1     | 1     | 1     | xxxx xxxx x00x 0111 |

0 = OFF, 1 = ON, X = don't care

## 1.7 Homing

AMC CANopen drives support a wide variety of homing routines. These routines rely on signals such as limit switch, home switch, and encoder index signals to achieve precise starting positions. Four objects define the offset, speed, acceleration, and the particular homing method used. These objects are listed in the table below.

**TABLE 1.58 Homing Objects**

| Object Index | Description                                                     |
|--------------|-----------------------------------------------------------------|
| 607Ch        | Home Offset                                                     |
| 6099h        | Homing Speeds                                                   |
| 609Ah        | Homing Acceleration                                             |
| 6098h        | Homing Method                                                   |
| 2008.04h     | Hard Stop Detection Method (Only applicable to Methods -1 & -2) |

### 1.7.1 Home Offset

The home offset specifies the difference between the home position and the zero position. The home position is the position of the motor when the home switch or encoder index is toggled during a homing routine. The zero position is the position defined to be zero as seen by the CAN master. If the home offset is set to zero, the home position will be equal to the zero position.

### 1.7.2 Homing Speeds

There are two homing speeds to take into consideration: the speed during the search for home switch, and the speed during the search for the index. Typically, the speed during the search for the home switch is set to be faster than the speed during the search for the index.

### 1.7.3 Homing Acceleration

A single value is used to define the acceleration and deceleration of all moves during the homing routine.

### 1.7.4 Homing Methods


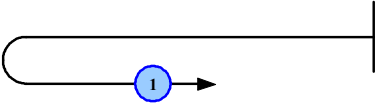

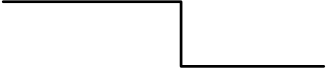
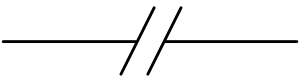
AMC CANopen homing methods depend on the presence of up to three different system components: an index pulse, a home switch, and a limit switch. The simplest homing methods require just one or none of these components, whereas the more complex methods require two or all of these components. All homing methods have been summarized in [Table 1.59](#), along with their necessary components, and have been named according to [DSP402] which states that there are a total of 35 possible homing methods, some of which are reserved and not currently specified.

**TABLE 1.59 Homing Methods Summary**

| Homing Method    | Index Pulse                                | Home Switch | Limit Switch |
|------------------|--------------------------------------------|-------------|--------------|
| Methods 1 & 2    | ✓                                          |             | ✓            |
| Methods 3 to 6   | ✓                                          | ✓           |              |
| Methods 7 to 14  | ✓                                          | ✓           | ✓            |
| Methods 15 & 16  | Reserved                                   |             |              |
| Methods 17 & 18  |                                            |             | ✓            |
| Methods 19 to 22 |                                            | ✓           |              |
| Methods 23 to 30 |                                            | ✓           | ✓            |
| Methods 31 & 32  | Reserved                                   |             |              |
| Methods 33 & 34  | ✓                                          |             |              |
| Method 35        |                                            |             |              |
| Method -1 & -2   | Home to Hard Stop (Refer to Section 1.7.5) |             |              |

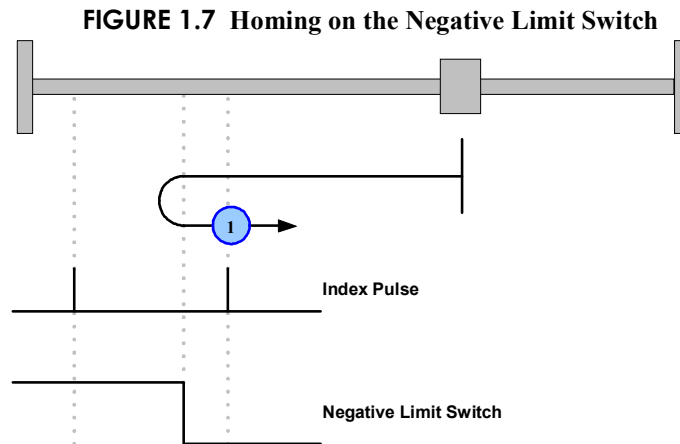
Because these homing methods can become fairly complex, they are best described visually. As a result, *homing diagrams* are utilized to illustrate the behavior of each method. Homing diagrams consist of multiple components each of which is described in [Figure 1.6](#).

**FIGURE 1.6 Homing Diagrams**

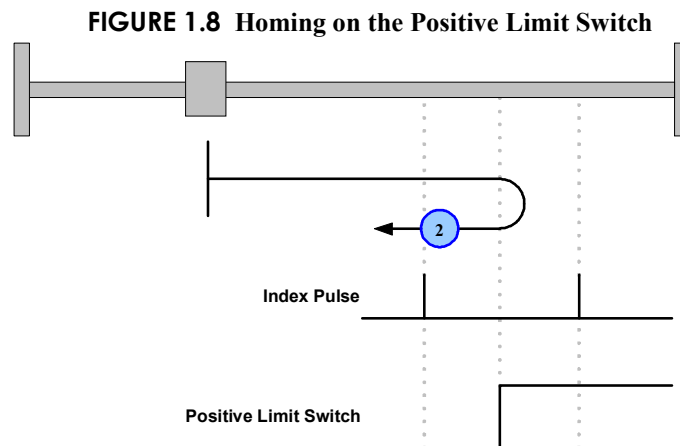
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Load and physical limits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
| The square near the middle of the illustration shows the load object that is to be moved. The endpoints represent physical limitations or barriers, which the load cannot travel past. The left side is in the negative direction while the right side is in the positive direction.                                                                                                                                                                                                                                                                                                                                        |                                                                                      |
| Direction of travel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| The vertical line on the right side represents the starting position. The load travels in the direction of the arrow. In the illustration shown, the load begins traveling in the negative direction and then switches directions to move in the positive direction. The circle represents the home position at which point the (actual) measured position is reset to zero. The small section of arrow following the circle represents the distance traveled, past the home position, during deceleration of the load. Lastly, the number in the circle represents the number designated to that particular homing method. |                                                                                      |
| Index Pulse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| Each vertical line represents one index pulse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                      |
| Limit/Home Switch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
| A label in the actual homing diagram will be used to label a switch as either a limit/home switch. As shown, there are only two positions for a switch: high (active) or low (inactive).                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                      |
| Break                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |
| Represents a break in the diagram. This is used for representing a length of distance too large to properly scale on the diagram.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |



**Method 1: Homing on the Negative Limit Switch** This method uses the negative limit switch and index to home the load. If the negative limit switch is off, the motor moves in the negative direction. Once the limit switch toggles, the motor changes direction and moves until the next encoder index. Homing is complete at this point. [Figure 1.7](#) illustrates the homing diagram for this method.

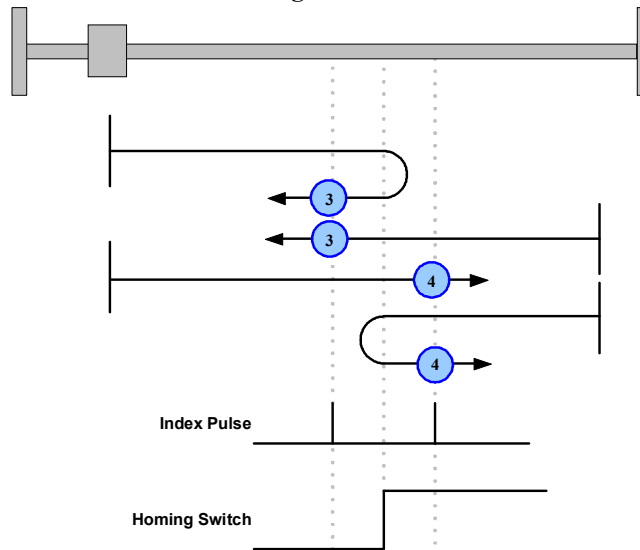


**Method 2: Homing on the Positive Limit Switch** This method uses the positive limit switch and index to home the load. If the positive limit switch is off, the motor moves in the positive direction. Once the limit switch toggles, the motor changes direction and moves until the next encoder index. Homing is complete at this point. [Figure 1.8](#) illustrates the homing diagram for this method.



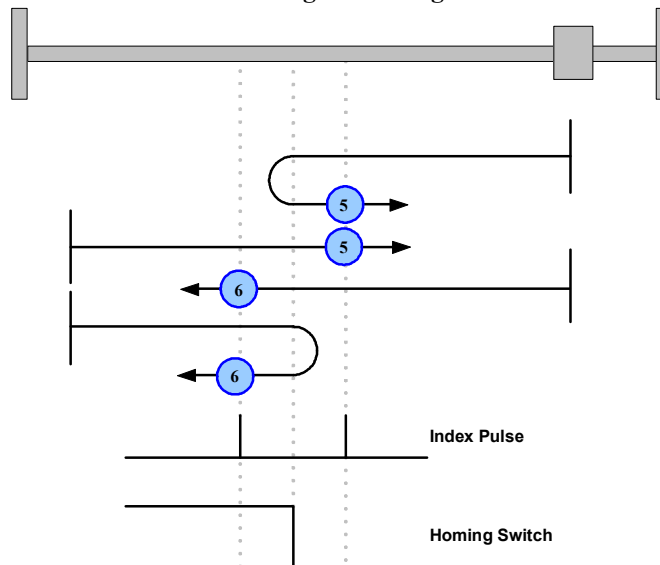
**Methods 3 and 4: Homing on the Positive Home Switch** These methods use the positive home switch and index to home the load. The initial direction of movement for a given routine method is dependent on the home switch position. However, the final position is always in the same direction. Homing methods 3 and four perform the same operations, but in opposite directions with opposite home switch polarity. Figure 1.9 illustrates the homing diagram for these methods.

**FIGURE 1.9 Homing on the Positive Home Switch**

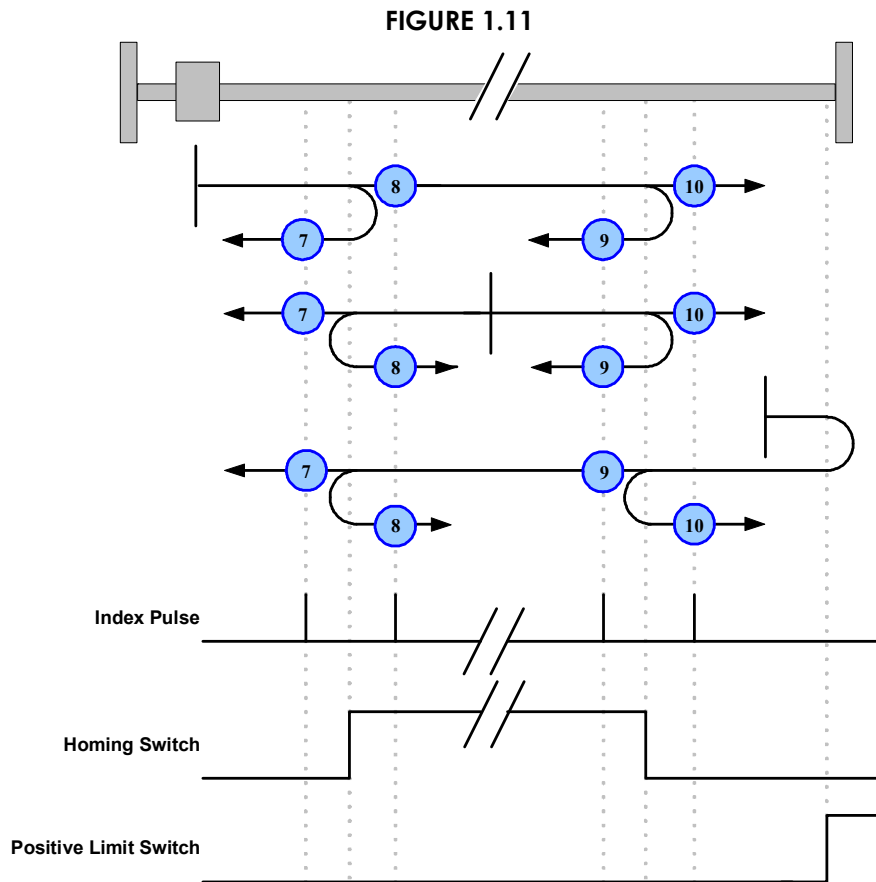


**Methods 5 and 6: Homing on the Negative Home Switch** This is literally a mirror image of the homing routines used by methods 3 and 4. Figure 1.10 illustrates the homing diagram for these methods.

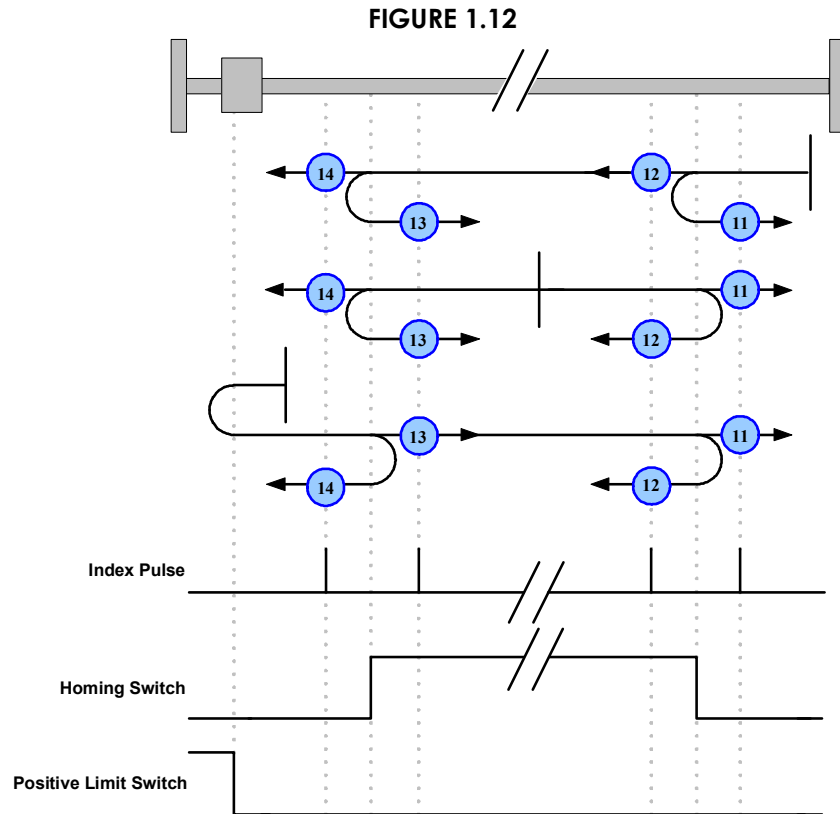
**FIGURE 1.10 Homing on the Negative Home Switch**



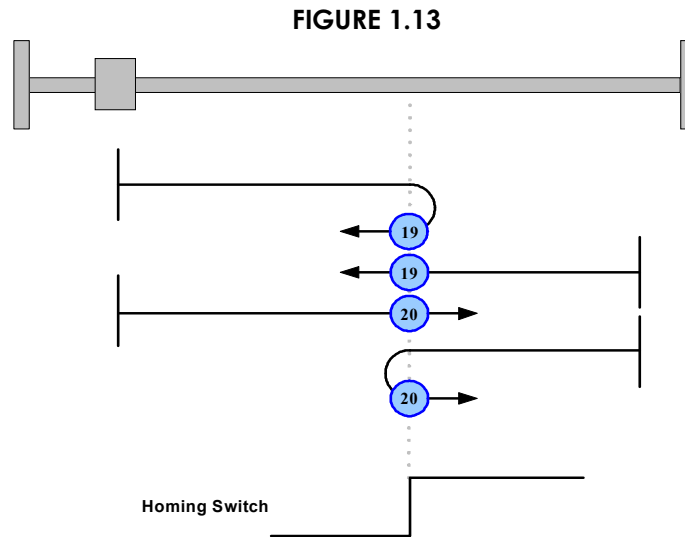
**Methods 7-14: Homing on the Home Switch** These methods use all three possible homing components (index pulse, home switch, and limit switch) with the index pulse to the nearest right or left of the home switch always being the sought after home position. Methods 7 to 10 use a positive limit switch and if the starting position is outside the active home switch region the initial direction of travel is always positive. For cases where the starting position is inside the active home switch region the initial direction will depend upon the index pulse being sought after: methods 7 & 8 home towards the left home switch edge so the initial direction will be left, whereas methods 9 & 10 home towards the right home switch edge so the initial direction will be right. Note that the only difference between methods 7 & 8 is that one homes to the index pulse left of the home switch edge whereas the other homes to the index pulse to the right; the same difference holds true for methods 9 & 10. Figure 1.11 illustrates the homing diagram for methods 7 to 10.



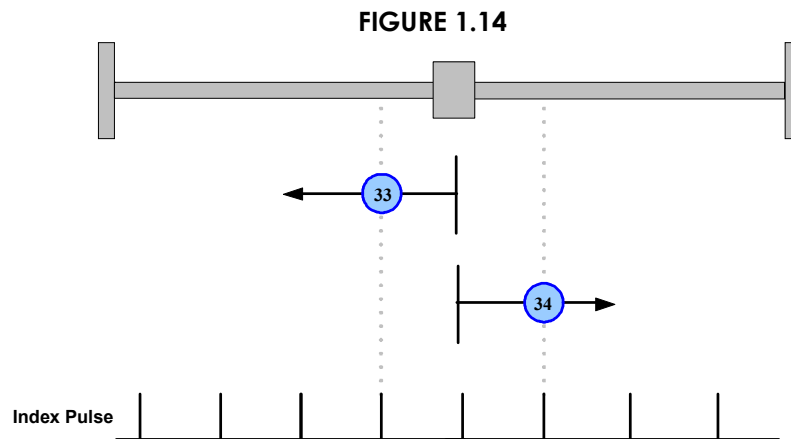
Methods 11 to 14 use a negative limit switch instead of a positive limit switch. As a result, the initial direction will be left, instead of right, whenever the starting point is outside of the active home switch region. Outside of this difference, methods 11 to 14 are identical to methods 7 to 10. [Figure 1.12](#) illustrates the homing diagram for methods 11 to 14.



**Methods 17-30: Homing without an Index Pulse** These homing routines use the same methods as 1 to 14, except the index pulse is not used. Instead, the home position is dependant on the edge of the relevant home or limit switch. To illustrate this difference, [Figure 1.13](#) shows the homing diagram for methods 19 and 20, which are equivalent to methods 3 and 4 without the index pulse.



**Methods 33 and 34: Homing on the Index Pulse** These homing methods home to the nearest index pulse. Method 33 homes in the negative directions and method 34 homes in the positive direction.



**Method 35** This homing method requires no index pulse or switches and involves nothing more than using object [“607Ch: Home Offset”](#) to set a desired home position.

**Homing Example** This example assumes the drive starts in Shutdown control state and Pre-Operational communication state. The 1<sup>st</sup> TPDO is setup to send upon any change in the StatusWord. The 13<sup>th</sup> bit of the StatusWord is the “Homing Complete” bit that will indicate when homing has completed and the drive mode may be changed.

**TABLE 1.60**

| COB-ID                                                                      | Number of Bytes | Message / Data          | Description                                                          |
|-----------------------------------------------------------------------------|-----------------|-------------------------|----------------------------------------------------------------------|
| 601                                                                         | 8               | 22 00 18 01 81 01 00 00 | Set 1 <sup>st</sup> TPDO COB-ID to 181h                              |
| 601                                                                         | 8               | 22 00 18 02 FF 00 00 00 | Set 1 <sup>st</sup> TPDO Trigger mechanism to “immediate”            |
| 601                                                                         | 8               | 22 7C 60 00 00 00 00 00 | Write 0 to home offset object                                        |
| 601                                                                         | 8               | 22 99 60 01 55 55 00 00 | Write 50 RPM to the Search For Home Switch speed                     |
| 601                                                                         | 8               | 22 99 60 02 55 55 00 00 | Write 50 RPM to the Search For Index Speed                           |
| 601                                                                         | 8               | 22 9A 60 00 37 89 41 00 | Write 10 <sup>^</sup> 5 Cnts/s <sup>^</sup> 2 to Homing Acceleration |
| 601                                                                         | 8               | 22 98 60 00 22 00 00 00 | Set Homing to method 34, “home to index in positive direction”       |
| 601                                                                         | 8               | 22 60 60 00 06 00 00 00 | Set the drive in Homing Mode                                         |
| 000                                                                         | 2               | 01 01                   | Start communication state machine so PDOs can be processed           |
| 601                                                                         | 8               | 22 40 60 00 07 00 00 00 | Set node 1 to Operation Disabled                                     |
| 601                                                                         | 8               | 22 40 60 00 0F 00 00 00 | Set node 1 to Operation Enabled                                      |
| 601                                                                         | 8               | 22 40 60 00 1F 00 00 00 | Start Homing on node 1                                               |
| Wait for TPDO 1 to send a message containing 1 in the 13 <sup>th</sup> bit. |                 |                         |                                                                      |
| 601                                                                         | 8               | 22 40 60 00 0F 00 00 00 | Stop Homing on node 1                                                |
| 601                                                                         | 8               | 22 60 60 00 07 00 00 00 | Set node 1 in PVT mode                                               |

### 1.7.5 Hard Stop Homing

Hard Stop Homing can be used to determine the home position when there are no available sensors such as a Limit Switch or Home Switch. The motor will move at the configured velocity until it detects the end of travel by colliding with the hard limit of the system, such as the end of a linear track. The method of detection can be configured to be based on one or more of the events Sustained Current Indicator, Zero Velocity, and Position Following Error.

#### Method -1 & -2: Hard Stop Homing

FIGURE 1.15

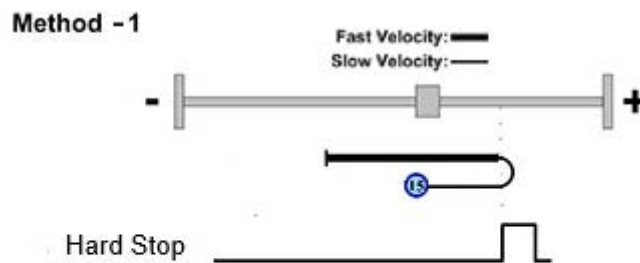
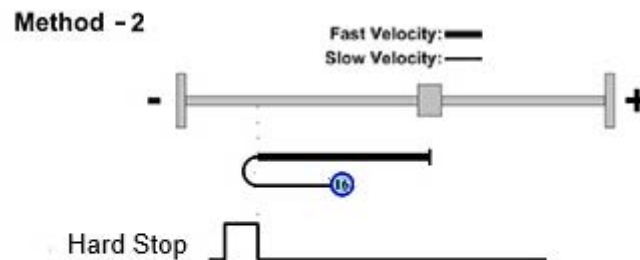


FIGURE 1.16

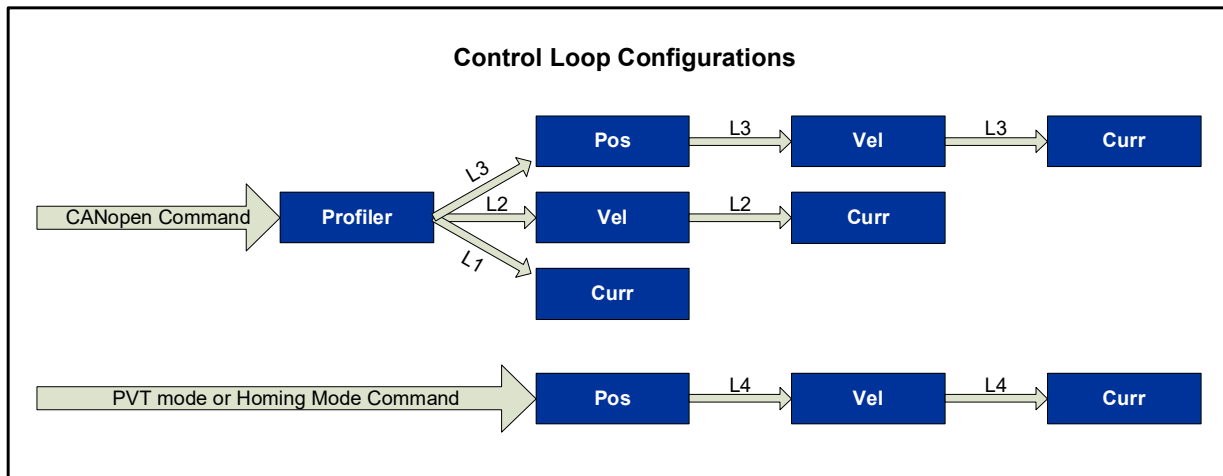


## 1.8 Modes of Operation

AMC CANopen drives close position, velocity, and torque (current) loops that are configurable via the CAN bus. There are 8 modes of operation available with object 6060h. Other modes of operation are achievable using ACE. When changing loop configurations using object 6060h, velocity and position loop feedback sources are not touched. This means changing loop configurations assumes the feedback wiring and project parameters are configured properly for both the present loop and the one the drive is moving to.

Follow the formula for Expedited SDO messages in the “SDO” section of this manual when writing to object 6060h. More information on object 6060h is found in the [“Object Dictionary”](#) on page 70.

**FIGURE 1.17** Available loop configurations via CANopen messaging.



**TABLE 1.61** Modes of Operation

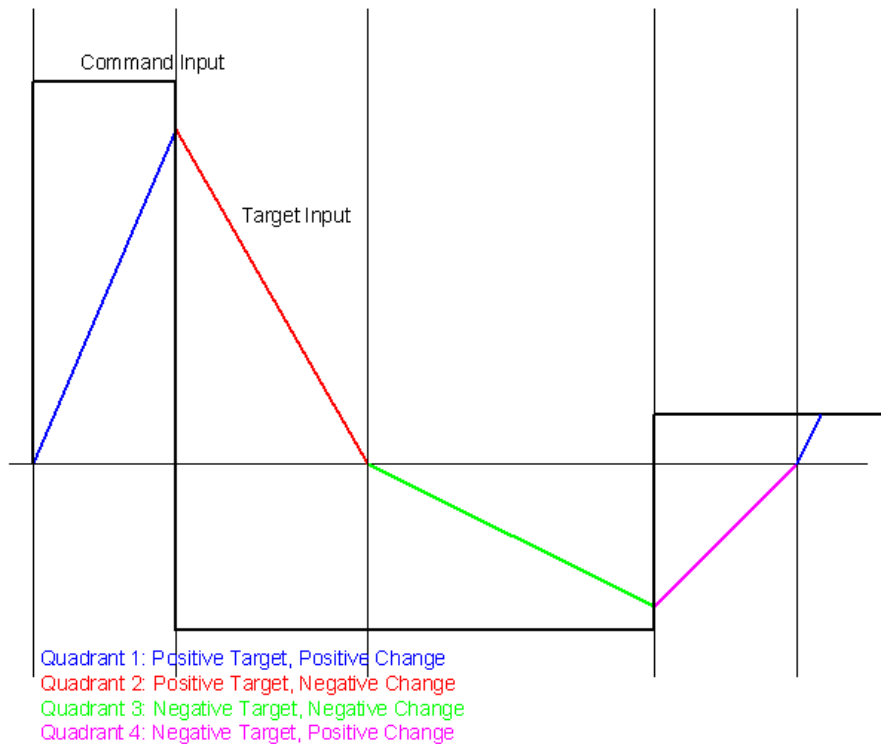
| Modes of Operation                 |
|------------------------------------|
| Profile Position Mode              |
| Profile Velocity Mode              |
| Profile Torque Mode (current mode) |
| Homing Mode                        |
| Interpolated Position Mode (PVT)   |
| Cyclic Synchronous Position Mode   |
| Cyclic Synchronous Velocity Mode   |
| Cyclic Synchronous Torque Mode     |
| Custom Configured Modes            |



### 1.8.1 Profile Modes

In a profile mode of operation, the trajectory is limited by the drive. Profile modes use the command limiter values (object 203C) to limit the maximum command rate. If the host sends a large command step, the drive spreads the demand over some period of time to stay equal to or below the maximum defined rate. The command limiter is configurable to supply up to 4 different slopes depending on the input, as shown in Figure 1.18 below.

FIGURE 1.18



**Profile Position Mode: (L3 from Figure 1.17)** The AMC Position control loop is a fully de-coupled PID with velocity and acceleration feedforward terms. In Profile Position Mode, the drive closes three control loops, position, velocity, and current. The velocity loop provides additional “stiffness,” keeping the dynamic position errors minimal because the drive now reacts not only to position errors, but also to velocity errors (which can be interpreted as position error changes). The Command Limiter is enabled in this mode. The Profiler sets limits on the rate of change of the target position command, otherwise called velocity. When commanding point-to-point moves, the velocity between points is limited to the maximum value set in the profiler. When tuning the position loop for profile position mode, proportional gain is typically all that is needed. It is important, however, to start with a stable, yet responsive velocity loop. Feedforward gain can be added to improve tracking performance, if needed. More information on tuning is found in the ACE application help files.

The following objects define how the drive will behave in Position mode.

TABLE 1.62

| Object index | Name                             | Description                                                                                      |
|--------------|----------------------------------|--------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation               | Sends a request to change the drive's mode of operation.                                         |
| 6061h        | Modes of Operation Display       | Displays the actual mode of operation.                                                           |
| 203Ch        | Command Limiter Parameters       | Sets the values used by the command limiter to limit the target command.                         |
| 6086h        | Motion Profile Type              | Sets profiling to linear ramp. Currently this is fixed and read only.                            |
| 2238h        | Position Loop Control Parameters | Sets the tuning values associated with the position loop                                         |
| 2039h        | Position Limits                  | Sets the trip points for various position events such as Max Measured Position Limit.            |
| 2012h        | Position Values                  | Read instantaneous values such as Position demand and Position Target. This object is read only. |
| 6064h        | Actual Position                  | Same as 2012.01h, reads measured position value.                                                 |
| 607Ah        | Target Position                  | Sets the target position command.                                                                |

**Profile Velocity Mode: (L2 from Figure 1.17)** The AMC Velocity control loop is a fully de-coupled PID with an acceleration feedforward term, and a low speed estimator. In Profile Velocity Mode, the drive closes two control loops, velocity, and current. Velocity feedback may be derived from a motor mounted encoder or analog source with a 10V maximum. The low speed estimator is most useful when necessarily tight velocity loops can cause audible noise during low speed moves (less than 1 count per velocity update).

The Command Limiter is enabled in this mode. The Limiter sets limits on the rate of change of the velocity command. When commanding large velocity transients, the resulting acceleration between points is limited to the maximum value set in the profiler.

When tuning the velocity loop it is important to start with a stable, yet responsive current loop. Feedforward gain can be added to improve tracking performance, if needed. More information on tuning is found in the ACE help files.

TABLE 1.63

| Object index | Name                           | Description                                                                                      |
|--------------|--------------------------------|--------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation             | Sends a request to change the drive's mode of operation.                                         |
| 6061h        | Modes of Operation Display     | Displays the actual mode of operation.                                                           |
| 203Ch        | Command Limiter Parameters     | Sets the values used by the command limiter to limit the target command.                         |
| 6086h        | Motion Profile Type            | Sets profiling to linear ramp. Currently this is fixed and read only.                            |
| 2236h        | Velocity Indicators and Limits | Sets the trip points for various velocity events such as Over Speed.                             |
| 2235h        | Velocity Loop Gain Parameters  | Sets the tuning values associated with the velocity loop                                         |
| 2011h        | Velocity Values                | Read instantaneous values such as Velocity demand and Velocity Target. This object is read only. |
| 6069h        | Velocity Sensor Actual Value   | Same as 2011.01h, reads pre-filtered measured velocity value.                                    |
| 606Bh        | Velocity Demand                | Same as 2011.04h, reads Velocity Demand value.                                                   |
| 606Ch        | Actual Velocity                | Same as 2011.02h, reads post-filtered measured velocity value.                                   |
| 60FFh        | Target Velocity                | Sets the target velocity command.                                                                |

**Profile Current Mode: (L1 from Figure 1.17)** Presently AMC CANopen servo drives support Profile Current Mode, which is the basic building block of any CANopen servo system. The drive's current loop consists of a PI loop. Because torque is merely a constant  $K_t$  multiplied by a magnitude of current, it is the programmer's responsibility to convert current values into torque values in the software environment.

The Command Limiter is enabled in this mode and sets limits on the rate of change of the current command. During a step acceleration command, the change in commanded torque, known as Jerk, is limited to the maximum value set in the profiler.

Tune this loop according to "current loop tuning" instructions in the ACE Software Guide. The following objects are used to setup and operate the Current Mode:

**TABLE 1.64**

| Object index | Name                                | Description                                                                                                       |
|--------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation                  | Sends a request to change the drive's mode of operation.                                                          |
| 6061h        | Modes of Operation Display          | Displays the actual mode of operation                                                                             |
| 203Ch        | Command Limiter Parameters          | Sets the values used by the command limiter to limit the target command.                                          |
| 6086h        | Motion Profile Type                 | Sets profiling to linear ramp. Currently this is fixed and read only.                                             |
| 2231h        | Current Loop and Commutation Values | Sets the tuning and commutation values associated with the current loop.                                          |
| 6071h        | Target Current                      | Sets the target current command.                                                                                  |
| 6077h        | Actual Current                      | Reads the actual motor current (in case of 3-phase motors, this is a composite, equivalent single phase current). |

## 1.8.2 Homing Mode: (L4 from Figure 1.17)

See "[Homing](#)" on page 40 for detailed information about methods and hardware involved in homing.

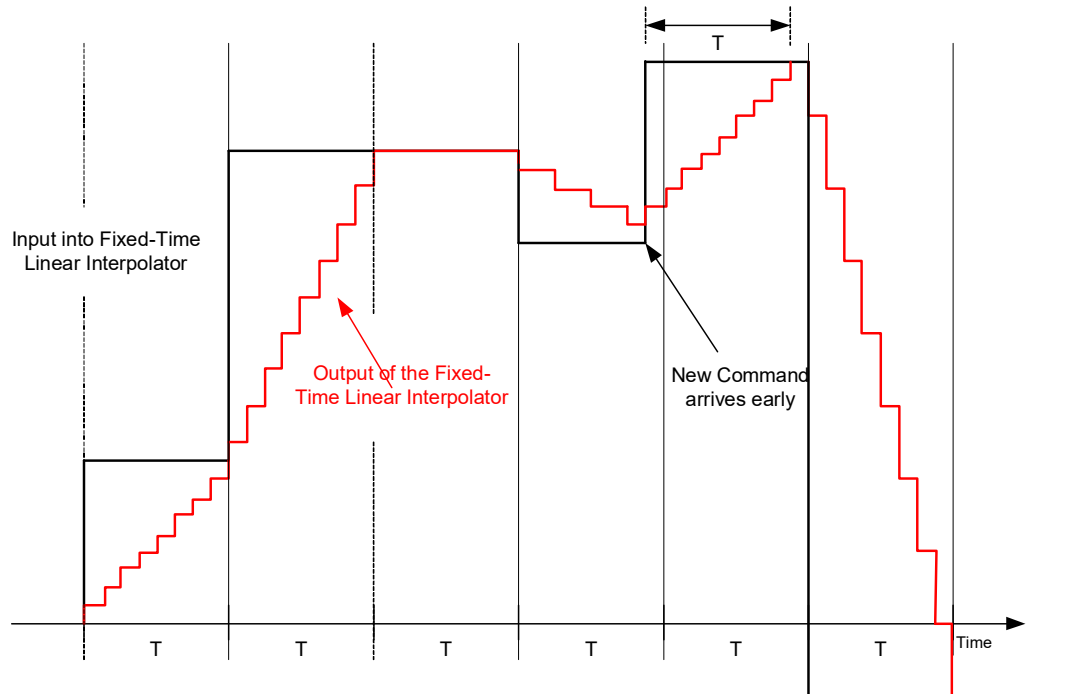
## 1.8.3 PVT (Interpolated Position Mode): (L4 from Figure 1.17)

PVT mode allows for synchronized multi axis move profiles using interpolated position and velocity. The three control loops, position, velocity, and current, are enabled while the profiler is disabled. The process for setting up and controlling motion using PVT Mode is explained in detail in "[PVT Mode](#)" on page 55.

## 1.8.4 Cyclic Synchronous Modes

Cyclic Synchronous Modes give responsibility of trajectory control to the host. There is no command limiter. Instead, the drive interpolates between command points, defining the rate by dividing the change in command by the interpolation time period (object 60C2). This allows the drive to respond smoothly to each step in command. [Figure 1.19](#) below shows how the drive interpolates different commands, with T representing the interpolation time. In each case, the drive arrives at the commanded value at precisely T seconds after the command changed.

FIGURE 1.19



**Cyclic Synchronous Position Mode** In Cyclic Synchronous Position Mode, the drive closes three control loops: position, velocity, and current. The host can send target position, velocity feedforward, and current feedforward values to the drive. This allows for gain compensation in applications with varying loads. The Command Limiter is disabled in this mode, giving the host more control over the motion profile.

The following objects define how the drive will behave in Cyclic Synchronous Position Mode.

| Object index | Name                             | Description                                                                                                       |
|--------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation               | Sends a request to change the drive's mode of operation.                                                          |
| 6061h        | Modes of Operation Display       | Displays the actual mode of operation.                                                                            |
| 60B1h        | Velocity Offset                  | Contains the input value for velocity feed forward.                                                               |
| 60B2h        | Current Offset                   | Contains the input value for current feed forward.                                                                |
| 60C2h        | Interpolation Time Period Value  | Contains the period used for the linear interpolation algorithm. Used with Cyclic synchronous modes of operation. |
| 2238h        | Position Loop Control Parameters | Sets the tuning values associated with the position loop.                                                         |
| 2039h        | Position Limits                  | Sets the trip points for various position events such as Max Measured Position Limit.                             |
| 2012h        | Position Values                  | Reads instantaneous values such as Position demand and Position Target. This object is read only.                 |
| 6064h        | Actual Position                  | Same as 2012.01h, reads measured position value.                                                                  |
| 607Ah        | Target Position                  | Sets the target position command.                                                                                 |

**Cyclic Synchronous Velocity Mode** In Cyclic Synchronous Velocity Mode, the drive closes the velocity loop around the current loop. The host can send target velocity, velocity offset, and current feedforward values to the drive. This allows for gain compensation in applications with varying loads. The Command Limiter is disabled in this mode, giving the host more control over the motion profile.

The following objects define how the drive will behave in Cyclic Synchronous Velocity Mode.

| Object index | Name                            | Description                                                                                                       |
|--------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation              | Sends a request to change the drive's mode of operation.                                                          |
| 6061h        | Modes of Operation Display      | Displays the actual mode of operation.                                                                            |
| 60B1h        | Velocity Offset                 | Contains the input value for velocity feed forward.                                                               |
| 60B2h        | Current Offset                  | Contains the input value for current feed forward.                                                                |
| 60C2h        | Interpolation Time Period Value | Contains the period used for the linear interpolation algorithm. Used with Cyclic synchronous modes of operation. |
| 2235h        | Velocity Loop Gain Parameters   | Sets the tuning values associated with the velocity loop.                                                         |
| 2236h        | Velocity Indicators and Limits  | Sets the trip points for various velocity events such as Over Speed.                                              |
| 2011h        | Velocity Values                 | Read instantaneous values such as Velocity Demand and Velocity Target. This object is read only.                  |
| 6069h        | Velocity Sensor Actual Value    | Same as 2011.01h, reads pre-filtered measured velocity value.                                                     |
| 606Bh        | Velocity Demand                 | Same as 2011.04h, reads Velocity Demand value.                                                                    |
| 606Ch        | Actual Velocity                 | Same as 2011.02h, reads post-filtered measured velocity value.                                                    |
| 60FFh        | Target Velocity                 | Sets the target velocity command.                                                                                 |

**Cyclic Synchronous Current Mode** In Cyclic Synchronous Current Mode, the drive closes the current loop. The host can send target current and current offset values to the drive. The Command Limiter is disabled in this mode, giving the host more control over the motion profile.

The following objects define how the drive will behave in Cyclic Synchronous Current Mode.

| Object index | Name                                          | Description                                                                                                       |
|--------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 6060h        | Modes Of Operation                            | Sends a request to change the drive's mode of operation.                                                          |
| 6061h        | Modes of Operation Display                    | Displays the actual mode of operation.                                                                            |
| 60B2h        | Current Offset                                | Contains the input value for current offset.                                                                      |
| 60C2h        | Interpolation Time Period Value               | Contains the period used for the linear interpolation algorithm. Used with Cyclic synchronous modes of operation. |
| 2231h        | Current Loop & Commutation Control Parameters | Sets the tuning values and commutation values associated with the current loop.                                   |
| 6071h        | Target Current                                | Sets the target current command.                                                                                  |
| 6077h        | Actual Current                                | Reads the actual motor current (in case of 3-phase motors, this is a composite, equivalent single phase current)  |

## 1.8.5 Custom Defined Modes Of Operation

*ADVANCED* Motion Controls digital servo drives provide flexibility beyond the CANopen defined standard modes of operation. For a case where a drive configuration is desired that is not available via object 6060h, contact *ADVANCED* Motion Controls directly for technical support.

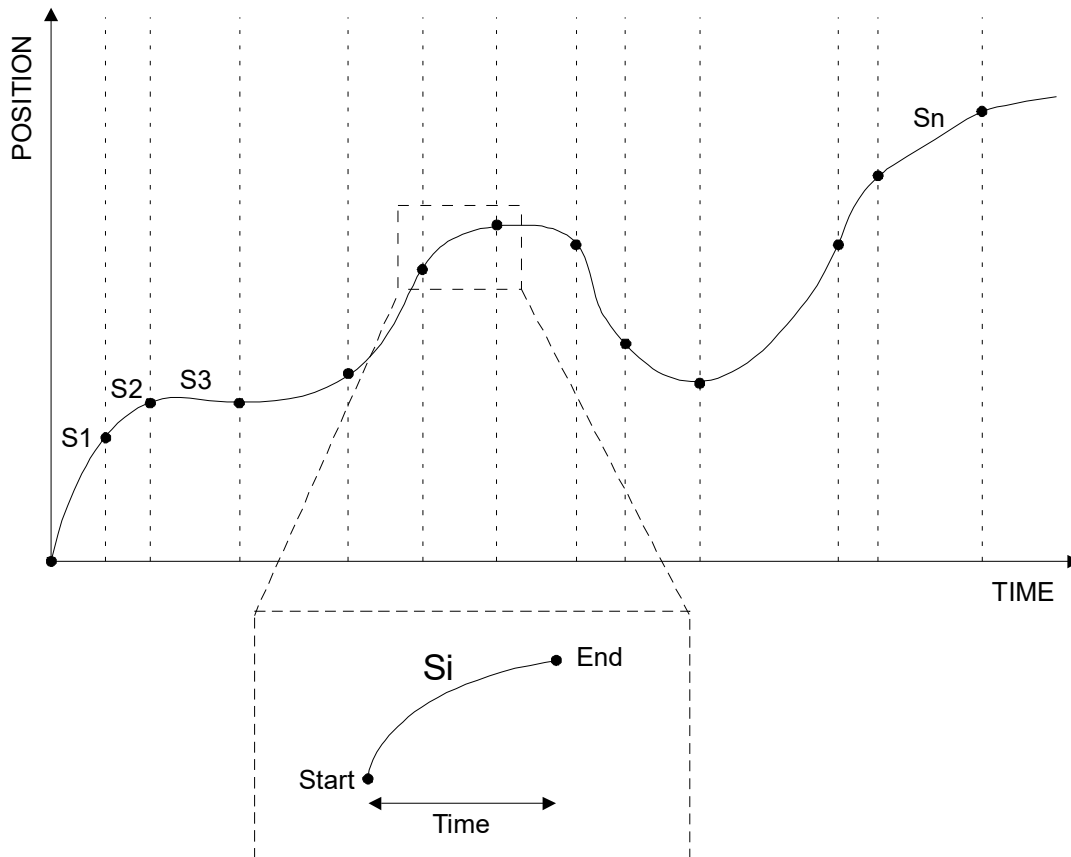
## 1.9 PVT Mode

### 1.9.1 PVT Overview

PVT mode is a position data-streaming mode that allows coordinated motion between multiple axes. Arbitrary position and velocity profiles can be executed on each axis. This is achieved via a so-called PVT command. A PVT command contains the position, velocity, and time information of profile segment end points. The servo drive performs a third order interpolation between segment end points. This results in a kind of partial trajectory generation where both host controller and servo drive generate a specific portion of the overall move profile trajectory. The host controller calculates position and velocity of intermittent points on the overall trajectory, while the servo drive interpolates between these intermittent points to ensure smooth motion. The actual position loop is closed within the drive. This reduces the amount of commands that need to be sent from host controller to drive, which is critical in distributed control systems. The number of segments and the time duration of each segment need to be selected based upon required accuracy and network bandwidth.

An arbitrary position profile can be split in multiple consecutive segments as follows:

FIGURE 1.20



Each segment has a start point and an end point. The end point of one segment is the start point of the next segment. Each segment end point (start or end) has a position and velocity value. The segment time can be variable depending on curvature (smaller time for rapidly changing positions).

PVT mode operates through PVT commands. A PVT command is an unconfirmed message (manufacturer specific RPDO 24). The PVT command contains segment end point position and velocity information, and segment time. A 15 level FIFO buffer alleviates host controller timing requirements. The buffer can be cleared and the buffer pointer can be re-positioned. The drive will also send the following PVT related error messages: buffer empty, buffer full, counter error, or message length error. The Time Stamp message can be used to maintain time synchronization of nodes involved in PVT motion.

## 1.9.2 PVT Messages

**Enable PVT** Since PVT commands are PDO messages, RPDO 24 must be enabled for PVT to work. To enable this PVT Buffer RPDO, configure its PDO Communication Parameter (1417.01h) to set bit 31 to 0 (enable PDO). In addition, the COB-ID for this PDO is selectable. Note that the following example assigns the COB-ID for this node to 531h.

TABLE 1.65

| Arbitration Field | Data Field |        |        |        |        |        |        |        |
|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID    | 22         | 17     | 14     | 01     | 31     | 05     | 00     | 00     |

**Mode Selection** To use PVT, the drive must be set for PVT Mode through Object 6060h (Modes of Operation). The message may look like this one where it is writing (without size indication) the value 07h for PVT mode into Object 6060h.

TABLE 1.66

| Arbitration Field | Data Field |        |        |        |        |        |        |        |
|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID    | 22         | 60     | 60     | 00     | 07     | 00     | 00     | 00     |

**Configuration** The following objects are useful for configuring the drive's behaviors in PVT mode. Set digital outputs to indicate PVT status or specify warning messages for minimum number of buffer points. When errors occur in PVT mode, select from multiple event actions to configure the drive to react appropriately.

TABLE 1.67

| Object index | Sub-index Range | Name                                | Description                                                                                                                            |
|--------------|-----------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 2048h        | 01h             | PVT Parameters                      | Specifies the minimum number of buffered PVT end points before a warning message is sent                                               |
| 205Ah        | 31h – 35h       | Digital Output Parameters           | Assign digital outputs to indicate specific PVT status                                                                                 |
| 2064h        | 1Ch – 20h       | Fault Response Time Parameters      | Sets the wait time before reacting to an occurrence of a PVT event                                                                     |
| 2065h        | 1Bh – 1Fh       | Fault Event Action Parameters       | Selects the event action when a PVT event occurs. Possible event actions include Disable Power Bridge, Dynamic Brake, and many others. |
| 2066h        | 22h – 26h       | Fault Recovery Time Parameters      | Sets the amount of time after the cause of the PVT fault no longer exists before drive fault condition is cleared                      |
| 2067h        | 1Fh – 23h       | Fault Time-Out Window Parameters    | Time after drive fault condition is cleared before a new occurrence is considered a new fault                                          |
| 2068h        | 27h – 2Bh       | Fault Maximum Recoveries Parameters | Max number of faults before a permanent action is taken                                                                                |



**PVT Message Protocol** Once the drive is configured, it is ready to receive PVT segment end points into its 15 level FIFO buffer. The construction of the PVT message is made up of the COB-ID and eight data bytes, which are made up of the segment end point position, velocity, segment time, and integrity counter. The COB-ID can be any unique user-selectable value within the range of 181h-57Fh over the entire CANopen network. Note that both the Position and Velocity data bytes (three bytes each) are arranged in Little Endian format.

**TABLE 1.68 PVT message construction**

| Arbitration Field | Data Field                  |        |        |                             |        |        |        |         |
|-------------------|-----------------------------|--------|--------|-----------------------------|--------|--------|--------|---------|
| COB-ID            | Byte 1                      | Byte 2 | Byte 3 | Byte 4                      | Byte 5 | Byte 6 | Byte 7 | Byte 8  |
| Unique ID: XXXh   | (LSB) Position Values (MSB) |        |        | (LSB) Velocity Values (MSB) |        |        | Time   | Counter |

**TABLE 1.69 PVT message description**

| Data Bytes | Name                       | Description                                                                                                                                                                                                                                                                                                             |
|------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Byte 1     | Position Segment End Point | The segment end point position is a 24-bit value in counts (absolute or incremental position). The data are entered as hexadecimal, where Byte 3 is the Most Significant Byte (MSB) and Byte 1 is the Least Significant Byte (LSB). For more information refer to <a href="#">“2048h: PVT Parameters” on page 145</a> . |
| Byte 2     |                            |                                                                                                                                                                                                                                                                                                                         |
| Byte 3     |                            |                                                                                                                                                                                                                                                                                                                         |
| Byte 4     | Velocity Segment End Point | The segment end point velocity is a 24-bit value in counts per second. The data are entered as hexadecimal, where Byte 6 is the Most Significant Byte (MSB) and Byte 4 is the Least Significant Byte (LSB).                                                                                                             |
| Byte 5     |                            |                                                                                                                                                                                                                                                                                                                         |
| Byte 6     |                            |                                                                                                                                                                                                                                                                                                                         |
| Byte 7     | Segment Time Duration      | Time duration in milliseconds. Minimum 2 (02h) milliseconds for 16kHz drives, 4 (04h) milliseconds for 10kHz drives. Maximum of 255 (FFh) milliseconds.                                                                                                                                                                 |
| Byte 8     | Integrity Counter          | The integrity counter is an incremental counter that starts at zero and wraps around after 255 (FFh). PVT commands with non-consecutive counter values will result in an error message.                                                                                                                                 |

**Clear Buffer** If for any reason the PVT buffer should be cleared, writing the value 00h to Object 60C4.06h will remove all the points previously loaded in the buffer. Byte 8, the counter, will need to start at 00 when loading the next buffer point. This will cause the “PVT Buffer Empty” and “PVT Buffer Threshold” drive events to become active.

**TABLE 1.70**

| Arbitration Field | Data Field |        |        |        |        |        |        |        |
|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID    | 22         | C4     | 60     | 06     | 01     | 00     | 00     | 00     |

**End of Motion** To end a PVT sequence, first insert a PVT point with a specified position, zero velocity, a specified time duration, and an Integrity Counter value incremented from the previous point. The next PVT point should have the same specified position, but with zero specified for both velocity and time. The Integrity Counter, however, continues to increment. Tables 1.71 and 1.72 give an example of the last two PVT messages to end the motion sequence.

TABLE 1.71

| Arbitration Field  | Data Field |        |        |        |        |        |        |        |
|--------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID             | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| Unique ID:<br>XXXh | P          | P      | P      | 00     | 00     | 00     | T      | C      |

TABLE 1.72

| Arbitration Field  | Data Field |        |        |        |        |        |        |        |
|--------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID             | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| Unique ID:<br>XXXh | P          | P      | P      | 00     | 00     | 00     | 00     | C + 1  |

**Start Motion** Once there are enough PVT end points in the PVT buffer, motion may begin. With the drive in Operation Enabled state, sending a broadcast message with COB-ID 500h (no data bytes required) will start motion on all axes. Note that this command can be sent as soon as the nodes involved have received at least one PVT command. To ensure smooth motion, new PVT commands must be sent in a timely fashion.



Note

Note that the Zero Velocity event must be active prior to sending the PVT start command, or motion will not occur.

TABLE 1.73

| Arbitration Field | Data Field |        |        |        |        |        |        |        |
|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 500h              | -          | -      | -      | -      | -      | -      | -      | -      |

**Stop Motion** When the drive executes the final PVT end sequence command, motion will stop. However as with any other modes, the ControlWord (Object 6040h) may stop the motion with a state change from the Operation Enabled state, to a disabled state such as Switch On Disabled.

TABLE 1.74

| Arbitration Field | Data Field |        |        |        |        |        |        |        |
|-------------------|------------|--------|--------|--------|--------|--------|--------|--------|
| COB-ID            | Byte 1     | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 |
| 600h + Node-ID    | 22         | 40     | 60     | 00     | 04     | 00     | 00     | 00     |

### 1.9.3 PVT Status

The following objects display the PVT status of the drive.

**TABLE 1.75**

| Object index | Sub-index range | Name                 | Description                                                 |
|--------------|-----------------|----------------------|-------------------------------------------------------------|
| 2002h        | 06h             | Drive Status         | The bits in this sub-index provide status on the PVT buffer |
| 201Dh        | 01h             | PVT Status           | Same as bits 0 – 5 of object 2002.06h                       |
| 201Dh        | 02h             | PVT Points Remaining | Remaining number of points in the buffer to be executed     |
| 201Dh        | 03h             | PVT Sequence Number  | The current PVT point in the buffer                         |

### 1.9.4 Buffer Characteristics

Object 60C4h is the Interpolation Data Configuration. It provides information regarding the PVT buffer and also allows modifications to the buffer, such as removing all the PVT end points already in the buffer.

**TABLE 1.76**

| Object index | Sub-index range | Name                | Description                                     |
|--------------|-----------------|---------------------|-------------------------------------------------|
| 60C4h        | 01h             | Max Buffer Size     | Maximum size of PVT buffer                      |
| 60C4h        | 02h             | Actual Buffer Size  | Shows the actual size of the PVT buffer         |
| 60C4h        | 03H             | Buffer Organization | Specifies that it is a FIFO buffer              |
| 60C4h        | 04H             | Buffer Position     | Indicates the position of the buffer            |
| 60C4h        | 05h             | Size of Data Record | Indicates the length of a PVT point (8 bytes)   |
| 60C4h        | 06h             | Buffer Clear        | Clears all segment end points in the PVT buffer |

**Error Messages** The drive will generate error messages in PVT mode. The emergency message protocol (COB-ID 80h + Node-ID) is used to transmit the error message. Refer to EMERGENCY Messages for decoding emergency messages.

### 1.9.5 PVT Example

This example shows how to configure and use PVT Mode to command a simple position move with a trapezoidal velocity profile. The motor is commanded from 0 to a position of 80,000 counts in 12 seconds, where the accel and decel is limited to 2500 counts/s and the max velocity during the move is 10,000 counts/s. A scope plot of the move, along with the PVT points is shown as well. This example can be extended to any position trajectory by using different PVT points. SDO size indication is disabled in this example.

#### *Transition to the Switch On Disabled State*

Read 6041.h to verify which state the drive is in.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 40 41 60 00 00 00 00 00 | 704                     | 704                             |
| 581    | 8          | 42 41 60 00 37 06 00 00 | 705                     | 1                               |

Write the appropriate data to the Control Word 6040h to place the drive in Switch on Disabled State.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 40 60 00 04 00 00 00 | 705                     | 0                               |
| 581    | 8          | 60 40 60 00 00 00 00 00 | 706                     | 1                               |

#### *Configure the 24th RPDO*

First transition the drive into the pre-operational NMT state to allow for PDO configuration.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 000    | 8          | 80 01 00 00 00 00 00 00 | 706                     | 0                               |

The 24th RPDO is used to write PVT points to the PVT buffer. To configure the 24th RPDO, set the COB-ID of the 24th RPDO (COB-ID is 501h in this example) and set bit 31 to 0 to turn the RPDO on.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 17 14 01 01 05 00 00 | 707                     | 0                               |
| 581    | 8          | 60 17 14 01 00 00 00 00 | 708                     | 1                               |

#### *Set Mode of Operation to PVT Mode*

Write a 7h to 6060h to put the drive in PVT Mode.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 60 60 00 07 00 00 00 | 708                     | 0                               |
| 581    | 8          | 60 60 60 00 00 00 00 00 | 709                     | 1                               |

### Set Buffer Threshold Warning Level

A buffer threshold warning will occur when the number of PVT points in the PVT buffer is less than the value in the Buffer Threshold Warning object 2048.01h. The value is 10 (Ah) in this example.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 48 20 01 0A 00 00 00 | 709                     | 0                               |
| 581    | 8          | 60 48 20 01 00 00 00 00 | 710                     | 1                               |

### Configure the 24th TPDO

The 24th TPDO is transmitted when a buffer threshold warning occurs, that is when the number of PVT points in the buffer is less than the value in the Buffer Threshold Warning object 2048.01h. The data in the TPDO is the number of points currently in the buffer..

To configure the 24th TPDO, set the COB-ID of the 24th TPDO (COB-ID is 381h in this example) and set bit 31 to 0 to turn the TPDO on.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 17 18 01 81 03 00 00 | 710                     | 0                               |
| 581    | 8          | 60 17 18 01 00 00 00 00 | 711                     | 1                               |

### Other PVT Setup

Transition the drive into the operational NMT state to allow use of PDOs.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 000    | 8          | 01 01 00 00 00 00 00 00 | 711                     | 0                               |

Write a 0 to the PVT Input Method object 2048.02 if the PVT points are absolute. Write a 1 for incremental PVT points. This example uses absolute PVT points.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 48 20 02 00 00 00 00 | 711                     | 0                               |
| 581    | 8          | 60 48 20 02 00 00 00 00 | 712                     | 1                               |

Clear the PVT buffer by writing a 0 to the Buffer Clear object 60C4.06h.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 C4 60 06 00 00 00 00 | 712                     | 0                               |
| 581    | 8          | 60 C4 60 06 00 00 00 00 | 713                     | 1                               |

### Enable the Drive

The following frames alternately write to the control word and read the Status word until the drive is in the Operation Enabled state.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 22 40 60 00 06 00 00 00 | 713                     | 0                               |
| 581    | 8          | 60 40 60 00 00 00 00 00 | 714                     | 1                               |
| 601    | 8          | 40 41 60 00 00 00 00 00 | 764                     | 50                              |
| 581    | 8          | 42 41 60 00 21 06 00 00 | 765                     | 1                               |
| 601    | 8          | 22 40 60 00 0F 00 00 00 | 815                     | 50                              |
| 581    | 8          | 60 40 60 00 00 00 00 00 | 816                     | 1                               |

The following message checks to see if the drive is in the fault state.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 601    | 8          | 40 41 60 00 00 00 00 00 | 866                     | 50                              |
| 581    | 8          | 42 41 60 00 37 06 00 00 | 866                     | 0                               |

### Load the PVT Buffer

The PVT buffer is a FIFO buffer that can contain up to 15 PVT points. The first 15 PVT points are written to the buffer using the 24th RPDO.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 501    | 8          | 4E 00 00 71 02 00 FA 00 | 866                     | 0                               |
| 501    | 8          | 38 01 00 E2 04 00 FA 01 | 867                     | 1                               |
| 501    | 8          | BF 02 00 53 07 00 FA 02 | 867                     | 0                               |
| 501    | 8          | E2 04 00 C4 09 00 FA 03 | 867                     | 0                               |
| 501    | 8          | A1 07 00 35 0C 00 FA 04 | 867                     | 0                               |
| 501    | 8          | FC 0A 00 A6 0E 00 FA 05 | 867                     | 0                               |
| 501    | 8          | F4 0E 00 17 11 00 FA 06 | 867                     | 0                               |
| 501    | 8          | 88 13 00 88 13 00 FA 07 | 867                     | 0                               |
| 501    | 8          | B8 18 00 F9 15 00 FA 08 | 868                     | 1                               |
| 501    | 8          | 84 1E 00 6A 18 00 FA 09 | 868                     | 0                               |
| 501    | 8          | ED 24 00 DB 1A 00 FA 0A | 868                     | 0                               |
| 501    | 8          | F2 2B 00 4C 1D 00 FA 0B | 868                     | 0                               |
| 501    | 8          | 93 33 00 BD 1F 00 FA 0C | 868                     | 0                               |
| 501    | 8          | D0 3B 00 2E 22 00 FA 0D | 868                     | 0                               |
| 501    | 8          | AA 44 00 9F 24 00 FA 0E | 868                     | 0                               |

### Start PVT

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 500    | 8          | 00 00 00 00 00 00 00 00 | 868                     | 0                               |

The 24th TPDO transmits everytime the number of points in the PVT buffer is less than the buffer threshold warning value. In this example, the buffer threshold is 10 which means when the 10th PVT point is consumed, the 24th TPDO transmits and tells you there are 9 points left in the buffer. When this occurs, we know to send 6 more PVT points to fill the (15 point) buffer. This continues until all of the PVT points are consumed and the PVT stop point is sent.

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 381    | 4          | 09 00 00 00             | 2375                    | 1507                            |
| 501    | 8          | 20 4E 00 10 27 00 FA 0F | 2375                    | 0                               |
| 501    | 8          | E4 57 00 10 27 00 FA 10 | 2376                    | 1                               |
| 501    | 8          | A8 61 00 10 27 00 FA 11 | 2376                    | 0                               |
| 501    | 8          | 6C 6B 00 10 27 00 FA 12 | 2376                    | 0                               |
| 501    | 8          | 30 75 00 10 27 00 FA 13 | 2376                    | 0                               |
| 501    | 8          | F4 7E 00 10 27 00 FA 14 | 2376                    | 0                               |

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 381    | 4          | 09 00 00 00             | 3875                    | 1499                            |
| 501    | 8          | B8 88 00 10 27 00 FA 15 | 3875                    | 0                               |
| 501    | 8          | 7C 92 00 10 27 00 FA 16 | 3876                    | 1                               |
| 501    | 8          | 40 9C 00 10 27 00 FA 17 | 3876                    | 0                               |
| 501    | 8          | 04 A6 00 10 27 00 FA 18 | 3876                    | 0                               |
| 501    | 8          | C8 AF 00 10 27 00 FA 19 | 3876                    | 0                               |
| 501    | 8          | 8C B9 00 10 27 00 FA 1A | 3876                    | 0                               |

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 381    | 4          | 09 00 00 00             | 5375                    | 1499                            |
| 501    | 8          | 50 C3 00 10 27 00 FA 1B | 5376                    | 1                               |
| 501    | 8          | 14 CD 00 10 27 00 FA 1C | 5376                    | 0                               |
| 501    | 8          | D8 D6 00 10 27 00 FA 1D | 5376                    | 0                               |
| 501    | 8          | 9C E0 00 10 27 00 FA 1E | 5376                    | 0                               |
| 501    | 8          | 60 EA 00 10 27 00 FA 1F | 5376                    | 0                               |
| 501    | 8          | D5 F3 00 9F 24 00 FA 20 | 5376                    | 0                               |

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 381    | 4          | 09 00 00 00             | 6875                    | 1499                            |
| 501    | 8          | AF FC 00 2E 22 00 FA 21 | 6875                    | 0                               |
| 501    | 8          | EC 04 01 BD 1F 00 FA 22 | 6875                    | 1                               |
| 501    | 8          | 8E 0C 01 4C 1D 00 FA 23 | 6875                    | 0                               |
| 501    | 8          | 92 13 01 DB 1A 00 FA 24 | 6875                    | 0                               |
| 501    | 8          | FB 19 01 6A 18 00 FA 25 | 6876                    | 1                               |
| 501    | 8          | C7 1F 01 F9 15 00 FA 26 | 6876                    | 0                               |

| COB-ID | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|--------|------------|-------------------------|-------------------------|---------------------------------|
| 381    | 4          | 09 00 00 00             | 8375                    | 1499                            |
| 501    | 8          | F8 24 01 88 13 00 FA 27 | 8375                    | 0                               |
| 501    | 8          | 8B 29 01 17 11 00 FA 28 | 8375                    | 0                               |
| 501    | 8          | 83 2D 01 A6 0E 00 FA 29 | 8375                    | 0                               |
| 501    | 8          | DE 30 01 35 0C 00 FA 2A | 8376                    | 1                               |
| 501    | 8          | 9E 33 01 C4 09 00 FA 2B | 8376                    | 0                               |
| 501    | 8          | C0 35 01 53 07 00 FA 2C | 8376                    | 0                               |

| COB-ID           | # of Bytes | Message / Data          | Message Time Stamp (ms) | Time From Previous Message (ms) |
|------------------|------------|-------------------------|-------------------------|---------------------------------|
| 381              | 4          | 09 00 00 00             | 9875                    | 1499                            |
| 501              | 8          | 47 37 01 E2 04 00 FA 2D | 9875                    | 0                               |
| 501              | 8          | 31 38 01 71 02 00 FA 2E | 9875                    | 0                               |
| 501              | 8          | 80 38 01 00 00 00 FA 2F | 9875                    | 0                               |
| 501 <sup>1</sup> | 8          | 80 38 01 00 00 00 00 30 | 9876                    | 1                               |
| 381 <sup>2</sup> | 4          | 09 00 00 00             | 10875                   | 999                             |

1. PVT stop point
2. Buffer threshold warning

### Raw PVT Points

The units for position, velocity, and time are counts, counts/s, and milliseconds, respectively.

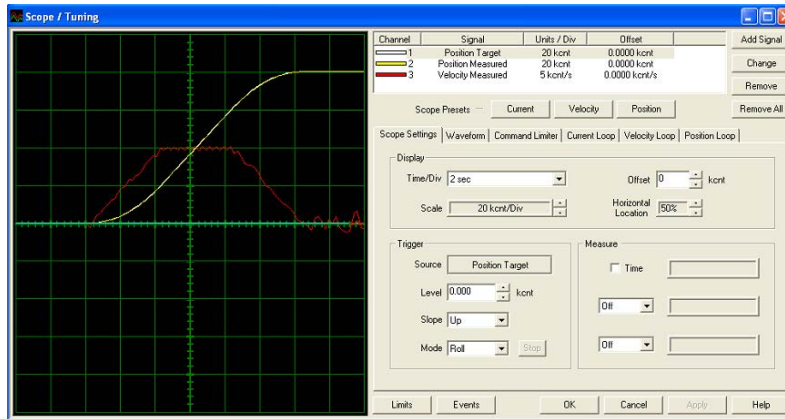
| #  | P     | V     | T   |
|----|-------|-------|-----|
| 1  | 78    | 625   | 250 |
| 2  | 312   | 1250  | 250 |
| 3  | 703   | 1875  | 250 |
| 4  | 1250  | 2500  | 250 |
| 5  | 1953  | 3125  | 250 |
| 6  | 3812  | 3750  | 250 |
| 7  | 3828  | 4375  | 250 |
| 8  | 5000  | 5000  | 250 |
| 9  | 6328  | 5625  | 250 |
| 10 | 7812  | 6250  | 250 |
| 11 | 9453  | 6875  | 250 |
| 12 | 11250 | 7500  | 250 |
| 13 | 13203 | 8125  | 250 |
| 14 | 15312 | 8750  | 250 |
| 15 | 17578 | 9375  | 250 |
| 16 | 20000 | 10000 | 250 |
| 17 | 22500 | 10000 | 250 |

| #  | P     | V     | T   |
|----|-------|-------|-----|
| 18 | 25000 | 10000 | 250 |
| 19 | 27500 | 10000 | 250 |
| 20 | 30000 | 10000 | 250 |
| 21 | 32500 | 10000 | 250 |
| 22 | 35000 | 10000 | 250 |
| 23 | 37500 | 10000 | 250 |
| 24 | 40000 | 10000 | 250 |
| 25 | 42500 | 10000 | 250 |
| 26 | 45000 | 10000 | 250 |
| 27 | 47500 | 10000 | 250 |
| 28 | 50000 | 10000 | 250 |
| 29 | 52500 | 10000 | 250 |
| 30 | 55000 | 10000 | 250 |
| 31 | 57500 | 10000 | 250 |
| 32 | 60000 | 10000 | 250 |
| 33 | 62421 | 9375  | 250 |

| #  | P     | V    | T   |
|----|-------|------|-----|
| 34 | 64687 | 8750 | 250 |
| 35 | 66796 | 8125 | 250 |
| 36 | 68750 | 7500 | 250 |
| 37 | 70546 | 6875 | 250 |
| 38 | 72187 | 6250 | 250 |
| 39 | 73671 | 5625 | 250 |
| 40 | 75000 | 5000 | 250 |
| 41 | 76171 | 4375 | 250 |
| 42 | 77187 | 3750 | 250 |
| 43 | 78046 | 3125 | 250 |
| 44 | 78750 | 2500 | 250 |
| 45 | 79296 | 1875 | 250 |
| 46 | 79687 | 1250 | 250 |
| 47 | 79921 | 625  | 250 |
| 48 | 80000 | 0    | 250 |
| 49 | 80000 | 0    | 0   |



## Oscilloscope Plot of PVT Move



## 1.10 Connecting to an AMC CANopen Drive

Connecting to an *ADVANCED* Motion Controls' CANopen drive is possible via two communication interfaces on the drive. One interface is the CANopen communication interface, which is used after the drive is configured for proper operation. The other interface is a RS-232 serial communication interface. This is used when first configuring a drive project file according to the application needs and storing it to the drive's Non Volatile Memory.

### 1.10.1 RS-232 Interface Setup

All that is needed is a standard serial cable connected from the drive RS-232 port to a computer. If the computer does not have a serial port on it, a converter such as USB to RS-232 may be used. Other converters may be used as long as they can operate between 9600 and 115200 baud. Higher baud rates will achieve better performance for the oscilloscope and other various features. Refer to the hardware manual and software configuration manual for more information about connecting to the RS232 interface.

### 1.10.2 CAN Interface Setup

Before communication can occur over a CANopen network, each node on the network must be configured for a specific node address, baud rate, and termination setting.

**Node Addressing** Each node in a CANopen network must have a unique Node-ID. Please refer to the hardware manual and software configuration manual for more information regarding address selection.

**Baud Rate Selection** Each node in a CANopen network (including the host) must operate at the same CAN bus bit rate. Please refer to the hardware manual for information regarding CAN bus baud rate selection.

**Termination Setting** The last node in a CANopen network must provide CAN bus termination. Please refer to the drive manual for information regarding termination options.

## 1.11 Hardware Requirements

### 1.11.1 CAN Card

AMC CANopen drives communicate with any CAN compatible hardware. CAN hardware is readily available from a variety of vendors. PC based CAN controllers are found in several common forms such as parallel-to-CAN, USB-to-CAN, serial-to-CAN or PCI-to-CAN.

Regardless of manufacturer and type, the CAN controller must be installed along with its appropriate software.

### 1.11.2 API

Every CAN controller includes an API (application to programmer interface). This is a library of functions that allows a programmer to utilize the CAN card to communicate with nodes on a CANopen network. Documentation for the CAN card's API will be available from the manufacturer.

### 1.11.3 Mating Connector

AMC CANopen drives use a low-density, male, 9-pin D-SUB mating connector shown in the table below. All of the components can be obtained from Tyco Electronics at [www.tycoelectronics.com](http://www.tycoelectronics.com), or by calling (800-522-6752).

**TABLE 1.77**

| Parts Needed | Description                                                          | Part Number                          |
|--------------|----------------------------------------------------------------------|--------------------------------------|
| D-SUB plug:  | Main body, pins not inserted                                         | 205204-4                             |
| Shell Kit:   | Outer shell, metal plated for shielding. Includes strain relief.     | 748677-1                             |
| Pins:        | Insert pins for the Plug body. May be purchased loose or on a strip. | Loose: 5-66507-7<br>Strip: 3-66507-0 |

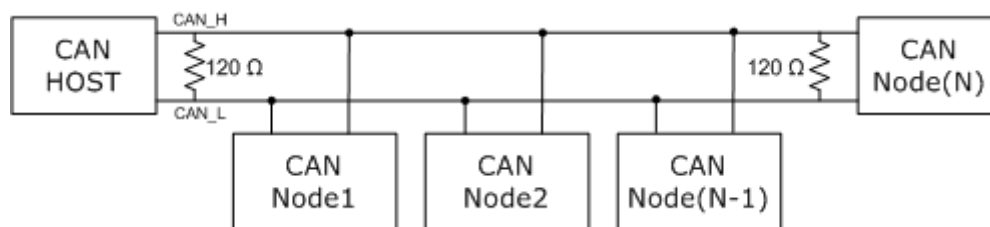
### 1.11.4 Wiring

Table 1.78 shows the standard AMC drive CANopen interface connector. Please note that the AMC ZDCR series drives have a different interface layout, refer to the drive's manual for a detailed description. Figure 1.21 shows an example of how the bus for an N node CANopen network should be wired.

TABLE 1.78

| PIN | NAME       | Description                                                                 | I/O    |
|-----|------------|-----------------------------------------------------------------------------|--------|
| 1   | --         | Not Connected                                                               | NA     |
| 2   | CAN_L      | CAN_L bus line (dominant low)                                               | Input  |
| 3   | CAN_GND    | CAN bus ground                                                              | GND    |
| 4   | --         | Not Connected                                                               | NA     |
| 5   | CAN_SHIELD | CAN shield                                                                  | SHIELD |
| 6   | --         | Not Connected                                                               | NA     |
| 7   | CAN_H      | CAN_H bus line (dominant high)                                              | Input  |
| 8   | CAN_TERM   | Termination. Connect to CAN_H for CAN bus termination via 120 Ohm resistor. | GND    |
| 9   | CAN_V+     | Optional external supply (7.5 – 24 VDC) for communication                   | Input  |

FIGURE 1.21



**CAN\_H, CAN\_L, CAN\_GND (Pins 7,2,3)** These are a differential pair referenced to signal ground; they are considered the CAN bus.

**CAN\_V+ (Pin 9)** Because the CAN interface can be completely isolated, external power may be required for the communication hardware in the drive. Please refer to the drive hardware manual for information regarding CAN interface isolation. The supply voltage common must connect to the CAN\_GND, pin-3.

**CAN SHIELD (Pin 5)** AMC recommends using shielded cable with shielded twisted pairs. Each twisted pair should have one drain wire that must be terminated on one end only.

**Proper Cable Shielding** Bring all twisted pair shields or drain wires to CAN\_SHIELD, pin-5. Do not connect the shield to anything on the other end of the cable.

Bring outer cable shield to the metal D-SUB connector shell that connects to the AMC drive. Do not connect the outer shield on the other end of the cable.

DO NOT TERMINATE SHIELDS ON BOTH ENDS OF ANY CABLE; DOING SO WILL CREATE GROUND LOOPS AND POSSIBLY CREATE NOISE PROBLEMS!

**CAN\_TERM (Pin 8)** The CAN network must be terminated by a 120 Ohm termination resistors on both ends. Generally the host controller will have the first 120-Ohm termination resistor in the network. The only other node to use a 120-Ohm termination resistor is the last node. Each node should branch from the main cable with the shortest possible stub length. This avoids reflections and transmission line effects in the communication line. If long branches are unavoidable, a termination resistor may be required.

## 2.1 Dictionary Table Format

The object dictionary provides one entry for each existing object. Since objects may or may not have sub-indices, the following convention is used for each entry:

**FIGURE 2.1 Object Table Convention**

| 2002.01h                                                                                                                                 | Sub Index Name             |           |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------|---------------|---------------|
| Data Type                                                                                                                                | Data Range                 | Units     | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                               | 0 - [2 <sup>(15)</sup> -1] | N/A (SF1) | Read / Write* | No            |
| <b>Description:</b><br>Detailed description of what this object does and how to use it.<br><br>* This indicates a note about conditions. |                            |           |               |               |

In the example of [Figure 2.1](#) the object index and sub-index is referenced via the dot (.). 2002h is the object index and .01h is the sub-index. Objects without sub-indices will be referenced without the dot (.). Furthermore, each entry has the following attributes:

- **Data Type:** This field specifies the data type of the object. Data types can be 8-bit, 16-bit, 32-bit, or string.
- **Range:** This field specifies the usable range of the values this object can contain.
- **Units:** This field specifies the units that apply to the value stored in this object. If the value contained in this object has no units, the field will contain "N/A". The appropriate physical unit is only supplied if there is a one-to-one relationship between the physical unit and the drive data type or if a generic scaling factor is used. If a generic scaling factor is used, its abbreviation will be supplied in brackets beside the units (as shown in [Figure 2.1](#)). For units that require specific scaling between a physical unit and the drive data type, an abbreviation for a drive unit is supplied. All scaling factors and drive units are described in "[Appendix](#)" on page 337 according to their abbreviation.
- **Accessibility:** This field specifies whether the object can be read or written to. If there is a \* in this box, then the object may only be accessible in certain modes. See the Description box for more information about mode dependencies.
- **Stored to NVM:** This field specifies whether or not the object can be stored to Non Volatile Memory such that it is recalled on power up.
- **Description:** This field contains detailed information on the object and what it is used for.

## 2.2 Configuration Objects

---

Although the following objects are used predominately during drive setup and initialization, they are not restricted to use only during setup. Configuration objects can be divided into the following three categories.

- **Administrative Objects:** These objects are used for administrative operations such as loading or restoring parameters from non-volatile memory.
- **Communication Objects:** These objects determine the CANopen communication settings of the drive.
- **Drive Objects:** These objects define the drive configuration and are largely determined by the ACE setup and configuration software. Objects which contain general drive information are also available.

## 2.2.1 General Settings

### 1000h: Device Type

| 1000h                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Device Type        |                                                                     |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Data Range         | Units                                                               | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0 – $2^{(32)} - 1$ | N/A                                                                 | Read Only     | No            |
| <b>Description:</b><br>Contains information about the device type. This 32-bit object is split into two 16-bit fields. Bits 0-15 describe the device profile and bits 16-31 supply additional optional information about the device. AMC drives fit under device profile number 402 (Drives and Motion Control), which is represented by 0192h in the first 16-bit field. Servo drives are designated by setting the second bit of the second field (bit 17) to 1. |                    |                                                                     |               |               |
| Bit 0-15                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    | Device Profile Number = 0192h (402 - Drives and Motion Controllers) |               |               |
| Bit 16-23                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    | Type = 02h (Servo Drive)                                            |               |               |
| Bit 24-31                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    | Reserved = 00                                                       |               |               |

### 2100h: Data Acquisition Module Command Overview

| 2100.01h                                                        | Module Status      |                                                                                                                                                                                                                                         |               |               |
|-----------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                       | Data Range         | Units                                                                                                                                                                                                                                   | Accessibility | Stored to NVM |
| Unsigned16                                                      | 0 – $2^{(16)} - 1$ | N/A                                                                                                                                                                                                                                     | Read Only     | No            |
| <b>Description:</b><br>16-bit Data Acquisition Status Register. |                    |                                                                                                                                                                                                                                         |               |               |
| <b>Bits</b>                                                     | <b>Name</b>        | <b>Description</b>                                                                                                                                                                                                                      |               |               |
| [7:0]                                                           | Runtime Mode       | This value indicates what the Module is doing:<br>0: Not Running<br>1: Idle Mode<br>2: Armed for Trigger Mode<br>3: Waiting for Trigger Mode<br>4: Capturing Data Mode<br>5: Post Capture Mode                                          |               |               |
| [11:8]                                                          | Buffer 1 Status    | This value indicates what each of the two Data Acquisition Buffers are doing:<br>0: Free/Unused<br>1: Presently Being filled with data<br>2: Buffer is full of data and ready to be read out<br>3: Buffer is busy transferring data out |               |               |
| [15:12]                                                         | Buffer 2 Status    |                                                                                                                                                                                                                                         |               |               |

| 2100.02h                                                            | Acquisition Mode Configuration |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |               |
|---------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                           | Data Range                     | Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Accessibility | Stored to NVM |
| Unsigned16                                                          | 0 – $2^{(16)} - 1$             | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Read / Write  | No            |
| <b>Description:</b><br>Configures the operation mode of the module. |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |               |
| Bits                                                                | Name                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |               |
| [7:0]                                                               | Operational Mode               | This value specifies the operational mode of the module. Valid values are:<br>0: Off<br>1: Auto Capture Mode: The specified data channels are constantly capturing data at the specified rate<br>2: Immediate Capture Mode: Regardless of the trigger configuration, the buffers will begin filling up with captured data<br>3: Normal Triggered Mode: Data capture will begin every time a valid trigger event occurs<br>4: Single Trigger Mode: Data will be captured starting from a valid trigger event and will continue until the final buffer is full                                                                                                                                                                                                                                                                                                                                                           |               |               |
| [15:8]                                                              | Data Decimation Rate           | This parameter specifies how much the sample data will be decimated. The valid values are as follows:<br>A sample will be taken:<br>0: Every servo interrupt, (approx. 50usec)<br>1: Every 2 Servo interrupt, (approx. 100usec)<br>2: Every 4 Servo interrupt, (approx. 200usec)<br>3: Every 10 Servo interrupts, (approx. 500usec)<br>4: Every 20 Servo interrupts, (approx. 1msec)<br>5: Every 40 Servo interrupts, (approx. 2msec)<br>6: Every 100 Servo interrupts, (approx. 5msec)<br>7: Every 200 Servo interrupts, (approx. 10msec)<br>8: Every 400 Servo interrupts, (approx. 20msec)<br>9: Every 1000 Servo interrupts, (approx. 50msec)<br>10: Every 2000 Servo interrupts, (approx. .1sec)<br>11: Every 4000 Servo interrupts, (approx. .2sec)<br>12: Every 10000 Servo interrupts, (approx. .5sec)<br>13: Every 20000 Servo interrupts, (approx. 1sec)<br>14: Every 40000 Servo interrupts, (approx. .sec) |               |               |



| 2100.03h                                                                     | Event Trigger Configuration |                                                                                                                                                                                                                                         |               |               |
|------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                    | Data Range                  | Units                                                                                                                                                                                                                                   | Accessibility | Stored to NVM |
| Unsigned16                                                                   | 0 – $2^{(16)} - 1$          | N/A                                                                                                                                                                                                                                     | Read / Write  | No            |
| <b>Description:</b><br>Configures what will cause the data capture to begin. |                             |                                                                                                                                                                                                                                         |               |               |
| Bits                                                                         | Name                        | Description                                                                                                                                                                                                                             |               |               |
| [0]                                                                          | Trigger 1 Polarity          | This configures the logical polarity of the two trigger sources. Valid values are:<br>0: Standard polarity<br>1: Inverted Polarity                                                                                                      |               |               |
| [1]                                                                          | Trigger 2 Polarity          |                                                                                                                                                                                                                                         |               |               |
| [6:2]                                                                        | Combination                 | This parameter Specifies the source of the Trigger event. Valid values are:<br>0: No Trigger Specified<br>1: Trigger 1 only<br>2: Trigger 2 only<br>3: Trigger1 OR Trigger 2<br>4: Trigger1 AND Trigger 2<br>5: Trigger 1 XOR Trigger 2 |               |               |
| [15:7]                                                                       | Trigger Position            | This 9bitU8 number specifies the percentage of the captured data that occurs BEFORE the trigger event. Valid range: $0 \leq \text{value} < 0x100$                                                                                       |               |               |

| 2100.04h                                                                  |                    | Trigger 1 Config              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|---------------------------------------------------------------------------|--------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Data Type                                                                 | Data Range         | Units                         | Accessibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Stored to NVM |
| Unsigned16                                                                | 0 – $2^{(16)} - 1$ | N/A                           | Read / Write                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No            |
| <b>Description:</b><br>Specifies what will cause Trigger #1 to go active. |                    |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
| Word                                                                      | Bits               | Name                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
| 0                                                                         | [7-0]              | Trigger Type                  | This value specifies the type of trigger. Valid values are:<br>0: No Trigger<br>1: Signal value rising through trigger level: Pre: sig < level => Post: sig > level<br>2: Signal value rising to/through trigger value: Pre: sig < level => Post: sig >= level<br>3: Signal Value falling through trigger level: Pre: sig > level => Post: sig < level<br>4: Signal Value falling to/through trigger level: Pre: sig > level => Post: sig <= level<br>5: Signal value Greater than the trigger level: sig > level<br>6: Signal value Greater than or equal to the trigger level: sig >= level<br>7: Signal value Less than the trigger value: sig < level<br>8: Signal value Less than or equal to the trigger value: sig <= level |               |
| 0                                                                         | [15-8]             | Trigger Signal Source Select  | This parameter selects the source of the trigger signal. Valid values are contained in the list of signal enums described above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |
| 1                                                                         | [7-0]              | Trigger Delay Count           | This 8bit parameter selects the number of triggers that will occur BEFORE the trigger event is generated and the data may be captured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
| 1                                                                         | [15-8]             | Debounce Count                | This 8bit parameter specifies the number of data samples that the trigger condition must be valid before a trigger is signaled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
| 2                                                                         | [15-0]             | Minimum Active Time           | Specifies the minimum number off data samples that the condition must be true (not implemented yet)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| 3                                                                         | [15-0]             | Maximum Active Time           | Specifies the maximum number for data samples that the condition must be true (not implemented yet)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| 7-4                                                                       | -                  | Trigger Threshold Information | The value of this parameter is dependent of the trigger type as described below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |

| 2100.05h                                                                  |                    | Trigger 2 Config              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|---------------------------------------------------------------------------|--------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Data Type                                                                 | Data Range         | Units                         | Accessibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Stored to NVM |
| Unsigned16                                                                | 0 – $2^{(16)} - 1$ | N/A                           | Read / Write                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No            |
| <b>Description:</b><br>Specifies what will cause Trigger #2 to go active. |                    |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
| Word                                                                      | Bits               | Name                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
| 0                                                                         | [7-0]              | Trigger Type                  | This value specifies the type of trigger. Valid values are:<br>0: No Trigger<br>1: Signal value rising through trigger level: Pre: sig < level => Post: sig > level<br>2: Signal value rising to/through trigger value: Pre: sig < level => Post: sig >= level<br>3: Signal Value falling through trigger level: Pre: sig > level => Post: sig < level<br>4: Signal Value falling to/through trigger level: Pre: sig > level => Post: sig <= level<br>5: Signal value Greater than the trigger level: sig > level<br>6: Signal value Greater than or equal to the trigger level: sig >= level<br>7: Signal value Less than the trigger value: sig < level<br>8: Signal value Less than or equal to the trigger value: sig <= level |               |
| 0                                                                         | [15-8]             | Trigger Signal Source Select  | This parameter selects the source of the trigger signal. Valid values are contained in the list of signal enums described above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |
| 1                                                                         | [7-0]              | Trigger Delay Count           | This 8bit parameter selects the number of trigger events that will occur BEFORE the data is captured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |
| 1                                                                         | [15-8]             | Debounce Count                | This 8bit parameter specifies the number of data samples that the trigger condition must be valid before a trigger event is signaled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |
| 2                                                                         | [15-0]             | Minimum Active Time           | Specifies the minimum number off data samples that the condition must be true (not implemented yet)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| 3                                                                         | [15-0]             | Maximum Active Time           | Specifies the maximum number for data samples that the condition must be true (not implemented yet)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
| 7-4                                                                       | -                  | Trigger Threshold Information | The value of this parameter is dependent of the trigger type as described below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |

| 2100.06h                                                                                                                                                                  |                    | Trace Table                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Data Type                                                                                                                                                                 | Data Range         | Units                           | Accessibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 – $2^{(16)} - 1$ | N/A                             | Read / Write                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No            |
| <b>Description:</b><br>A list of enum values that specifies which drive signals to capture. See <a href="#">Table A.3</a> in Appendix B for a list of Drive Signal Enums. |                    |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| Word                                                                                                                                                                      | Bits               | Name                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
| 0                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 1  | This parameter selects the source of the captured signal. Valid values are contained in the list of signal enums as described above. The size of the selected signals, in words, must not exceed 16. Signals with 16-bits of data consume 1 channel, Signals with 32-bits of data consume 2 channels, etc. A signal is selected from the master list of signals listed above. Any combination of signals may be captured, as long as the total number of channels consumed is less than or equal to 16. |               |
| 0                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 1                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 1                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 4  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 2                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 5  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 2                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 6  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 3                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 7  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 3                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 8  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 4                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 9  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 4                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 10 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 5                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 11 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 5                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 12 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 6                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 13 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 6                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 7                                                                                                                                                                         | [7-0]              | Capture Signal Source Select 15 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| 7                                                                                                                                                                         | [15-8]             | Capture Signal Source Select 16 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |

**2200h: File Transfer System**

| 2200.01h                                                                                                            | File Transfer System Status |                                                                                                                                                                                                                                                                            |               |               |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                           | Data Range                  | Units                                                                                                                                                                                                                                                                      | Accessibility | Stored to NVM |
| Unsigned16                                                                                                          | N/A                         | N/A                                                                                                                                                                                                                                                                        | Read Only     | No            |
| <b>Description:</b><br>Can be used to read the status of the FTS module and what type of file has been transferred. |                             |                                                                                                                                                                                                                                                                            |               |               |
| Bits                                                                                                                | Name                        | Description                                                                                                                                                                                                                                                                |               |               |
| [3:0]                                                                                                               | Transfer Status             | 0 - Idle<br>1 - Reset Pending<br>2 - Read in Progress<br>3 - Read Complete<br>4 - Write in Progress<br>5 - Write Complete<br>6 - Parameter File Load in Progress<br>7 - Parameter File Store in Progress<br>8 - Parameter File Load Error<br>9 - Parameter File Read Error |               |               |
| [7:4]                                                                                                               | File Type                   | 0 - No File<br>1 - User Storage<br>2 - Data Acquisition File<br>3 - ACE Storage<br>4 - Drive Parameter<br>5 - ACE Shared - Read Only<br>6 - ACE Shared - Read/Write                                                                                                        |               |               |
| [15:8]                                                                                                              | Reserved                    | Read as zero.                                                                                                                                                                                                                                                              |               |               |

| 2200.02h                                                                                                                                                                                                                                                                                                                                                                                 | File Transfer System Command |                                                                                                                                                                                                                                                                                                                                                                                         |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                | Data Range                   | Units                                                                                                                                                                                                                                                                                                                                                                                   | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                               | N/A                          | N/A                                                                                                                                                                                                                                                                                                                                                                                     | Read/Write    | No            |
| <b>Description:</b><br>Can be used to read the status of the FTS module and what type of file has been transferred. To store all parameters to NVM the user should first read 2200.01h to confirm the status of the FTS module. The user can proceed with writing 0xA5DE0944 to 2200.02h to store all parameters if the transfer status of the FTS module returns a value of 0, 3, or 5. |                              |                                                                                                                                                                                                                                                                                                                                                                                         |               |               |
| Bits                                                                                                                                                                                                                                                                                                                                                                                     | Name                         | Description                                                                                                                                                                                                                                                                                                                                                                             |               |               |
| [3:0]                                                                                                                                                                                                                                                                                                                                                                                    | Command/Action               | 0 - Reset<br>1 - Write<br>2 - Read                                                                                                                                                                                                                                                                                                                                                      |               |               |
| [7:4]                                                                                                                                                                                                                                                                                                                                                                                    | File Type                    | 0 - No File<br>1 - User Storage<br>3 - ACE Storage<br>5 - ACE Shared - Read Only<br>6 - ACE Shared - Read/Write                                                                                                                                                                                                                                                                         |               |               |
| [15:8]                                                                                                                                                                                                                                                                                                                                                                                   | Transfer Type/Size           | The type of file that will be transferred. This will also determine the sub-index the file will be transferred to.<br><br>Valid Values:<br>0 - 16 words; sub-index 3<br>1 - 32 words; sub-index 4<br>2 - 64 words; sub-index 5<br>3 - 128 words; sub-index 6<br>4 - 256 words; sub-index 7<br>5 - 512 words; sub-index 8<br>6 - 1024 words; sub-index 9<br>7 - 2048 words; sub-index 10 |               |               |
| [31:16]                                                                                                                                                                                                                                                                                                                                                                                  | File Index                   | This determines which index, or offset, of the File Type will be transferred.<br><br>Valid Values:<br>0 to "storage size divided by transfer size minus 1"<br><br>ACE Storage - 6144 words<br>ACE Shared - 2048 words<br>User Storage - 4096 words                                                                                                                                      |               |               |

| 2200.03h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.04h                                                                                                                                                | Block Transfer - 32 Words |                  |                                                                                                                                                                                                                                                                  |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Data Type                                                                                                                                               | Data Range                | Units            | Accessibility                                                                                                                                                                                                                                                    | Stored to NVM |
| Structure                                                                                                                                               | N/A                       | N/A              | Read/Write                                                                                                                                                                                                                                                       | No            |
| <b>Description:</b><br>This sub-index is a 34-word register. Up to 32 words of data can be transferred here using the FTS command object and then read. |                           |                  |                                                                                                                                                                                                                                                                  |               |
| Word                                                                                                                                                    | Bits                      | Name             | Description                                                                                                                                                                                                                                                      |               |
| 0                                                                                                                                                       | [3:0]                     | Transfer Command | An Action enum indicating the indented type of transfer.                                                                                                                                                                                                         |               |
|                                                                                                                                                         | [7:4]                     | File Type        | A File type enum indicating the file that is being transferred.                                                                                                                                                                                                  |               |
|                                                                                                                                                         | [15:8]                    | Transfer Type    | A Transfer type enum that MUST match the sub-index that will be read from or written to.                                                                                                                                                                         |               |
| 1                                                                                                                                                       | [9:0]                     | File Index       | This is an unsigned integer that represents the array element of the transfer type that is "overlaid" on top of the specified file storage area. If the file index specified references an area that is outside of the file storage area, the command will fail. |               |
|                                                                                                                                                         | [15:10]                   | Reserved         | Should always be zero                                                                                                                                                                                                                                            |               |
| 2-33                                                                                                                                                    | -                         | User Data        | This block of data is the data that is being written to/read from the drive.                                                                                                                                                                                     |               |

| 2200.05h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.06h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.07h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.08h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.09h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.0Ah  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.0Bh  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2200.0Ch  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

### 100Ch: Guard Time

| 100Ch                                                                                                                                                                                                                           | Guard Time     |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                       | Data Range     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                      | 0 – $2^{16}-1$ | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Used with object 100Dh (Life Time Factor) to store the guard time in ms and the Life Time Factor. The Life Time Factor multiplied with the guard time gives the lifetime for the Life Guarding Protocol. |                |       |               |               |

### 100Dh: Life Time Factor

| 100Dh                                                                                                                                                                                                                     | Life Time Factor |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                 | Data Range       | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                                                 | 0 – $2^8-1$      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Used with object 100Ch (Guard Time) to store the guard time in ms and the Life Time Factor. The Life Time Factor multiplied with the guard time gives the lifetime for the Life Guarding Protocol. |                  |       |               |               |



**1016h: Consumer Heartbeat Time**

| 1016.01h                                                                                                                                                                                                                                                                                                                                                                                                                                               | Consumer Heartbeat Time |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Range              | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 – $2^{(32)} - 1$      | milliseconds (ms) | Read / Write  | No            |
| <b>Description:</b><br>Represents the time in which the consumer should expect to receive a heartbeat message. If a heartbeat is not detected within this time frame, the drive will experience a communication error. The action taken during a communication error is configurable. When set to zero, the consumer heartbeat time function is turned off. For details about the format of this sub-index see <a href="#">“Heartbeat” on page 9</a> . |                         |                   |               |               |

**1017h: Producer Heartbeat Time**

| 1017.00h                                                                                                                                                                                                                                                                 | Producer Heartbeat Time |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                | Data Range              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                               | 0 – $2^{(16)} - 1$      | milliseconds (ms) | Read / Write  | No            |
| <b>Description:</b><br>Represents the time between successive heartbeat messages. Once assigned to a device, that device will begin sending heartbeat messages. They can be any integer value between 1 and 65535. When set to zero, the producer heartbeat is disabled. |                         |                   |               |               |

**1018h: Identity Object**

| 1018.01h                                                                                                   | Vendor ID  |       |               |               |
|------------------------------------------------------------------------------------------------------------|------------|-------|---------------|---------------|
| Data Type                                                                                                  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                 | N/A        | N/A   | Read Only     | No            |
| <b>Description:</b><br>A unique vendor identifier. Always BDh for <i>ADVANCED</i> Motion Controls' drives. |            |       |               |               |

**20E6h: CANopen Configuration Parameters**

| 20E6.01h                                                                                                                                                                                                                  | Baud Rate           |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|-------|-----------------|---|---------------------|---|----------|---|----------|---|----------|
| Data Type                                                                                                                                                                                                                 | Data Range          | Units | Accessibility | Stored to NVM |       |                 |   |                     |   |          |   |          |   |          |
| Unsigned16                                                                                                                                                                                                                | 0-3                 | Kbps  | Read / Write  | Yes           |       |                 |   |                     |   |          |   |          |   |          |
| <b>Description:</b><br>Supported CAN Baud Rate values.                                                                                                                                                                    |                     |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
| <table><tr><th>Value</th><th>Baud rate speed</th></tr><tr><td>0</td><td>1000 Kbps (Default)</td></tr><tr><td>1</td><td>500 Kbps</td></tr><tr><td>2</td><td>250 Kbps</td></tr><tr><td>3</td><td>125 Kbps</td></tr></table> |                     |       |               |               | Value | Baud rate speed | 0 | 1000 Kbps (Default) | 1 | 500 Kbps | 2 | 250 Kbps | 3 | 125 Kbps |
| Value                                                                                                                                                                                                                     | Baud rate speed     |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
| 0                                                                                                                                                                                                                         | 1000 Kbps (Default) |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
| 1                                                                                                                                                                                                                         | 500 Kbps            |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
| 2                                                                                                                                                                                                                         | 250 Kbps            |       |               |               |       |                 |   |                     |   |          |   |          |   |          |
| 3                                                                                                                                                                                                                         | 125 Kbps            |       |               |               |       |                 |   |                     |   |          |   |          |   |          |

| 20E6.02h                                                                                                                                                           | Node Address |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range   | Units | Accessibility | Stored to NVM |
| N/A                                                                                                                                                                | 1 - 127      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each node in a CANopen network must have a unique Node-ID. Node Address is configurable using rotary hardware switch or using ACE software. |              |       |               |               |

| 20E6.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Startup Mode of Operation                             |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|-----|-------------|---|-----------------------|---|-----------------------|---|------------------------------------|---|-------------|---|----------------------------------|---|----------------------------------|---|----------------------------------|---|-----------------------------------------------|----|----------|----|----------|----|----------|----|--------------------|----|-------------------------------------------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                            | Units | Accessibility | Stored to NVM |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0 – [2 <sup>(31)</sup> – 1]                           | N/A   | Read / Write  | Yes           |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| <b>Description:</b><br>Possible values:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                       |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>1</td><td>Profile Position Mode</td></tr><tr><td>3</td><td>Profile Velocity Mode</td></tr><tr><td>4</td><td>Profile Torque Mode (current mode)</td></tr><tr><td>6</td><td>Homing Mode</td></tr><tr><td>7</td><td>Interpolated Position Mode (PVT)</td></tr><tr><td>8</td><td>Cyclic Synchronous Position Mode</td></tr><tr><td>9</td><td>Cyclic Synchronous Velocity Mode</td></tr><tr><td>A</td><td>Cyclic Synchronous Torque Mode (current mode)</td></tr><tr><td>8C</td><td>Jog Mode</td></tr><tr><td>9E</td><td>Config 0</td></tr><tr><td>DE</td><td>Config 1</td></tr><tr><td>EC</td><td>Motion Engine Mode</td></tr><tr><td>FF</td><td>None (Use active configuration settings)<br/>(Default)</td></tr></table> |                                                       |       |               |               | Bit | Description | 1 | Profile Position Mode | 3 | Profile Velocity Mode | 4 | Profile Torque Mode (current mode) | 6 | Homing Mode | 7 | Interpolated Position Mode (PVT) | 8 | Cyclic Synchronous Position Mode | 9 | Cyclic Synchronous Velocity Mode | A | Cyclic Synchronous Torque Mode (current mode) | 8C | Jog Mode | 9E | Config 0 | DE | Config 1 | EC | Motion Engine Mode | FF | None (Use active configuration settings)<br>(Default) |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                           |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Profile Position Mode                                 |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Profile Velocity Mode                                 |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Profile Torque Mode (current mode)                    |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Homing Mode                                           |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Interpolated Position Mode (PVT)                      |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cyclic Synchronous Position Mode                      |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cyclic Synchronous Velocity Mode                      |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cyclic Synchronous Torque Mode (current mode)         |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 8C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Jog Mode                                              |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| 9E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Config 0                                              |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| DE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Config 1                                              |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| EC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Motion Engine Mode                                    |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |
| FF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | None (Use active configuration settings)<br>(Default) |       |               |               |     |             |   |                       |   |                       |   |                                    |   |             |   |                                  |   |                                  |   |                                  |   |                                               |    |          |    |          |    |          |    |                    |    |                                                       |

| 20E6.04h                                                                                                                                                                                                                                     | Size Indicated Answer                                                 |       |               |               |       |             |   |                                                                       |                    |                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------|---------------|---------------|-------|-------------|---|-----------------------------------------------------------------------|--------------------|--------------------------------------|
| Data Type                                                                                                                                                                                                                                    | Data Range                                                            | Units | Accessibility | Stored to NVM |       |             |   |                                                                       |                    |                                      |
| Unsigned16                                                                                                                                                                                                                                   | N/A                                                                   | N/A   | Read / Write  | Yes           |       |             |   |                                                                       |                    |                                      |
| <b>Description:</b><br>Note: Sub index 4 value is interrupted as Boolean.                                                                                                                                                                    |                                                                       |       |               |               |       |             |   |                                                                       |                    |                                      |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Drive does not respond with size indications in SDO message (Default)</td></tr><tr><td>Any non-zero value</td><td>Drive responds with size indications</td></tr></table> |                                                                       |       |               |               | Value | Description | 0 | Drive does not respond with size indications in SDO message (Default) | Any non-zero value | Drive responds with size indications |
| Value                                                                                                                                                                                                                                        | Description                                                           |       |               |               |       |             |   |                                                                       |                    |                                      |
| 0                                                                                                                                                                                                                                            | Drive does not respond with size indications in SDO message (Default) |       |               |               |       |             |   |                                                                       |                    |                                      |
| Any non-zero value                                                                                                                                                                                                                           | Drive responds with size indications                                  |       |               |               |       |             |   |                                                                       |                    |                                      |

| 20E6.05h                                  | CAN Option                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
|-------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|------------|------|-----------------------------------------------|---|---------------|---------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------|--------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|
| Data Type                                 | Data Range                  | Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Accessibility | Stored to NVM |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
| Unsigned16                                | 0 – [2 <sup>(16)</sup> – 1] | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Read / Write  | Yes           |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
| <b>Description:</b><br>Bit define values: |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
|                                           |                             | <table><tr><th>Bit Offset</th><th>Name</th><th>Description<br/>(1= Assigned, 0= Not Assigned)</th></tr><tr><td>0</td><td>Auto Sequence</td><td>State Machine Auto sequence- When assigned the drive will automatically sequence to the enable state when configured to do so.<br/>(Default)</td></tr><tr><td>1</td><td>Disable Msg Filter</td><td>Inhibit COB ID filtering - when assigned, COB ID filtering will be turned off. It is recommended to leave this bit unassigned.</td></tr><tr><td>2-15</td><td>Reserved</td><td>Reserved.</td></tr></table> |               |               | Bit Offset | Name | Description<br>(1= Assigned, 0= Not Assigned) | 0 | Auto Sequence | State Machine Auto sequence- When assigned the drive will automatically sequence to the enable state when configured to do so.<br>(Default) | 1 | Disable Msg Filter | Inhibit COB ID filtering - when assigned, COB ID filtering will be turned off. It is recommended to leave this bit unassigned. | 2-15 | Reserved | Reserved. |
| Bit Offset                                | Name                        | Description<br>(1= Assigned, 0= Not Assigned)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
| 0                                         | Auto Sequence               | State Machine Auto sequence- When assigned the drive will automatically sequence to the enable state when configured to do so.<br>(Default)                                                                                                                                                                                                                                                                                                                                                                                                                 |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
| 1                                         | Disable Msg Filter          | Inhibit COB ID filtering - when assigned, COB ID filtering will be turned off. It is recommended to leave this bit unassigned.                                                                                                                                                                                                                                                                                                                                                                                                                              |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |
| 2-15                                      | Reserved                    | Reserved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |               |            |      |                                               |   |               |                                                                                                                                             |   |                    |                                                                                                                                |      |          |           |

### 20EBh: Time Stamp Settings

| 20EB.01h                                                                                                                                                                           | CAN Time Stamp Milliseconds |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                  | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                         | 0 – $2^{(32)} - 1$          | milliseconds (ms) | Read/Write    | No            |
| <b>Description:</b><br>This specifies the initial value of the millisecond timer to be used as an initial time stamp value when the drive is configured to be a time stamp master. |                             |                   |               |               |

| 20EB.02h                                                                                                                                                                    | CAN Time Stamp Days |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range          | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 – $2^{(16)} - 1$  | milliseconds (ms) | Read/Write    | No            |
| <b>Description:</b><br>This specifies the initial value of the days timer to be used as an initial time stamp value when the drive is configured to be a time stamp master. |                     |                   |               |               |

| 20EB.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CAN Time Stamp State  |       |               |               |       |             |   |          |   |                      |   |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|-------|-------------|---|----------|---|----------------------|---|-----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Data Range            | Units | Accessibility | Stored to NVM |       |             |   |          |   |                      |   |                       |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A                   | N/A   | Read/Write    | No            |       |             |   |          |   |                      |   |                       |
| <b>Description:</b><br>This object specifies whether the drive supplies or receives time stamp messages, or if it is inactive. The default setting is 0. It should be noted that an object cannot be assigned as a CAN Time Stamp Slave (1). Once a node on the bus is set to be a CAN Time Stamp Master (2), then the other objects will be automatically assigned as CAN Time Stamp Slaves (1). The Slaves can then be toggled between Inactive (0) and Slave (1) configurations. |                       |       |               |               |       |             |   |          |   |                      |   |                       |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Inactive</td></tr><tr><td>1</td><td>CAN Time Stamp Slave</td></tr><tr><td>2</td><td>CAN Time Stamp Master</td></tr></table>                                                                                                                                                                                                                                                                                     |                       |       |               |               | Value | Description | 0 | Inactive | 1 | CAN Time Stamp Slave | 2 | CAN Time Stamp Master |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Description           |       |               |               |       |             |   |          |   |                      |   |                       |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Inactive              |       |               |               |       |             |   |          |   |                      |   |                       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAN Time Stamp Slave  |       |               |               |       |             |   |          |   |                      |   |                       |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAN Time Stamp Master |       |               |               |       |             |   |          |   |                      |   |                       |
| Note: If the drive acts as a time stamp master, it will begin broadcasting once configured. Each time stamp message will be broadcast approximately once every 75 seconds. The drive will stop broadcasting messages when in the stopped state. The worst-case jitter should be less than 100µs with medium bus traffic (<500µs with heavy traffic). The drive cannot be transitioned directly from Slave to Master or from Master to Slave.                                        |                       |       |               |               |       |             |   |          |   |                      |   |                       |

### 2005h: Serial Interface Configuration

| 2005.01h                                                   | RS-232 Drive Address |       |               |               |
|------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                  | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                 | 0 – 63               | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Specifies the RS-232 drive address. |                      |       |               |               |

| 2005.02h                                                                                                                                                                                                                                                                                                                                     | RS-232 Baud Rate   |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|-------|--------------------|---|------|---|-------|---|-------|---|-------|---|--------|---|--------|---|--------|---|--------|
| Data Type                                                                                                                                                                                                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| Unsigned16                                                                                                                                                                                                                                                                                                                                   | 0-7                | N/A   | Read/Write    | Yes           |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| <b>Description:</b><br>An integer value that corresponds to the RS-232 baud rate selection. The recommended baud rate is 115200. Use the table below to select the desired baud rate. Baud rates below 38400 are not recommended for drive commissioning.                                                                                    |                    |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| <table><tr><th>Value</th><th>Baud Rate (bits/s)</th></tr><tr><td>0</td><td>9600</td></tr><tr><td>1</td><td>19200</td></tr><tr><td>2</td><td>38400</td></tr><tr><td>3</td><td>57600</td></tr><tr><td>4</td><td>115200</td></tr><tr><td>5</td><td>230400</td></tr><tr><td>6</td><td>460800</td></tr><tr><td>7</td><td>921600</td></tr></table> |                    |       |               |               | Value | Baud Rate (bits/s) | 0 | 9600 | 1 | 19200 | 2 | 38400 | 3 | 57600 | 4 | 115200 | 5 | 230400 | 6 | 460800 | 7 | 921600 |
| Value                                                                                                                                                                                                                                                                                                                                        | Baud Rate (bits/s) |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 0                                                                                                                                                                                                                                                                                                                                            | 9600               |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 1                                                                                                                                                                                                                                                                                                                                            | 19200              |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 2                                                                                                                                                                                                                                                                                                                                            | 38400              |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 3                                                                                                                                                                                                                                                                                                                                            | 57600              |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 4                                                                                                                                                                                                                                                                                                                                            | 115200             |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 5                                                                                                                                                                                                                                                                                                                                            | 230400             |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 6                                                                                                                                                                                                                                                                                                                                            | 460800             |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |
| 7                                                                                                                                                                                                                                                                                                                                            | 921600             |       |               |               |       |                    |   |      |   |       |   |       |   |       |   |        |   |        |   |        |   |        |

## 2.2.2 PDO Configuration

**1400h: 1<sup>st</sup> Receive PDO Communication Parameter** This PDO is valid in all operating modes. The COB-ID of this PDO can be set to any value. See object 1600h for details about the data transmitted by this PDO.

| 1400.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1400.02h                                                                                                                                                                                      | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                     | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                   |       |               |               |

**1600h: 1<sup>st</sup> Receive PDO Mapping Parameter** This PDO is used to set the state of the drive (ex: ready, not ready, enabled, disabled, etc.). The object mapped to this PDO is fixed and not user selectable. See object 1400h for details on the transmission method.

| 1600.01h                                                                                                                                                               | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the ControlWord object (6040h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1401h: 2<sup>nd</sup> Receive PDO Communication Parameter** This PDO is valid in all operating modes. The COB-ID of this PDO can be set to any value. See object 1601h for details about the data transmitted by this PDO.

| 1401.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1401.02h                                                                                                                                                                                  | Transmission Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                 | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see Section <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1601h: 2<sup>nd</sup> Receive PDO Mapping Parameter** This PDO is used to set both the state of the drive (ex: enabled, disabled, faulted, etc.) and the mode of operation of the drive (ex: torque, velocity, or position modes). The objects mapped to this PDO are fixed and not user selectable. See object 1401h for details on the transmission method.

| 1601.01h                                                                                                                                                               | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the ControlWord object (6040h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1601.02h                                                                                                                                                                      | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                    | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Modes of Operation object (6060h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1402h: 3<sup>rd</sup> Receive PDO Communication Parameter** This PDO is valid in position modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1602h for details about the data transmitted by this PDO.

| 1402.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID’s for each PDO” on page 27.</a> |                    |       |               |               |

| 1402.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1602h: 3<sup>rd</sup> Receive PDO Mapping Parameter** This PDO is used to set both the state of the drive (ex: enabled, disabled, faulted, etc.) and the target position of the drive. The PDO is only used in position modes (see object 6060h for operating modes). The objects mapped to this PDO are fixed and not user selectable. See object 1402h for details on the transmission method.

| 1602.01h                                                                                                                                                              | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                            | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the ControlWord object (6040h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

| 1602.02h                                                                                                                                                                  | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Position object (607Ah). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

**1403h: 4<sup>th</sup> Receive PDO Communication Parameter** This PDO is valid in velocity modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1603h for details about the data transmitted by this PDO.

| 1403.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID’s for each PDO” on page 27.</a> |                    |       |               |               |

| 1403.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28</a> . |                   |       |               |               |

**1603h: 4<sup>th</sup> Receive PDO Mapping Parameter** This PDO is used to set both the state of the drive (ex: enabled, disabled, faulted, etc.) and the target velocity of the drive. The PDO is only used in velocity modes (see object 6060h for operating modes). The objects mapped to this PDO are fixed and not user selectable. See object 1403h for details on the transmission method.

| 1603.01h                                                                                                                                                               | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the ControlWord object (6040h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

| 1603.02h                                                                                                                                                                   | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                 | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Velocity object (60FFh). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1404h: 5<sup>th</sup> Receive PDO Communication Parameter** This PDO is valid in torque modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1604h for details about the data transmitted by this PDO.

| 1404.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27</a> . |                    |       |               |               |

| 1404.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28</a> . |                   |       |               |               |



**1604h: 5<sup>th</sup> Receive PDO Mapping Parameter** This PDO is used to set both the state of the drive (ex: enabled, disabled, faulted, etc.) and the target torque of the drive. The PDO is only used in torque modes (see object 6060h for operating modes). The objects mapped to this PDO are fixed and not user selectable. See object 1404h for details on the transmission method.

| 1604.01h                                                                                                                                                               | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the ControlWord object (6040h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1604.02h                                                                                                                                                                  | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Current object (6071h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1414h: 21<sup>st</sup> Receive PDO Communication Parameter** This PDO is valid in position modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1614h for details about the data transmitted by this PDO.

| 1414.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1414.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1614h: 21<sup>st</sup> Receive PDO Mapping Parameter** This PDO is used to set the target position of the drive. The PDO is only used in position modes (see object 6060h for operating modes). The object mapped to this PDO is fixed and not user selectable. See object 1414h for details on the transmission method.

| 1614.01h                                                                                                                                                                   | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                 | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Position object (607Ah). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1415h: 22<sup>nd</sup> Receive PDO Communication Parameter** This PDO is valid in velocity modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1615h for details about the data transmitted by this PDO.

| 1415.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID’s for each PDO” on page 27.</a> |                    |       |               |               |

| 1415.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1615h: 22<sup>nd</sup> Receive PDO Mapping Parameter** This PDO is used to set the target velocity of the drive. The PDO is only used in velocity modes (see object 6060h for operating modes). The object mapped to this PDO is fixed and not user selectable. See object 1415h for details on the transmission method.

| 1615.01h                                                                                                                                                                   | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                 | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Velocity object (60FFh). For details about the format of this sub-index see <a href="#">S“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

**1416h: 23<sup>rd</sup> Receive PDO Communication Parameter** This PDO is valid in torque modes only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1616h for details about the data transmitted by this PDO.

| 1416.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID’s for each PDO” on page 27.</a> |                    |       |               |               |

| 1416.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1616h: 23<sup>rd</sup> Receive PDO Mapping Parameter** This PDO is used to set the target current of the drive. The PDO is only used in torque modes (see object 6060h for operating modes). The object mapped to this PDO is fixed and not user selectable. See object 1416h for details on the transmission method.

| 1616.01h                                                                                                                                                                  | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Target Current object (6071h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1417h: 24<sup>th</sup> Receive PDO Communication Parameter** This PDO is valid in interpolated position mode (PVT mode) only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1617h for details about the data transmitted by this PDO.

| 1417.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID’s for each PDO” on page 27</a> . |                    |       |               |               |

| 1417.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28</a> . |                   |       |               |               |

**1617h: 24<sup>th</sup> Receive PDO Mapping Parameter** This PDO is used to send PVT commands (set-points) to the drive. The PDO is only available in interpolated position mode (see object 6060h for operating modes). The object mapped to this PDO is fixed and not user selectable. See object 1417h for details on the transmission method.

| 1617.01h                                                                                                                                                                             | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                           | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Interpolation Data Record object (60C1h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1419h: 26<sup>th</sup> Receive PDO Communication Parameter** This PDO is used to initiate the start of PVT execution. The PDO is only applicable when the mode of operation is interpolated position mode (see object 6060h for operating modes).

| 1419.01h                                                                                                                                                                                                 | COB-ID Used by PDO |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                               | N/A                | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. It is recommended to use the default value. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1419.02h                                                                                                                                                                                                                      | Transmission Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                     | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                                                     | 0 - 255           | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. It is recommended to use the default value. For details see <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1420h: 27<sup>th</sup> Receive PDO Communication Parameter** This PDO is valid in profile position mode only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1620h for details about the data transmitted by this PDO.

| 1420.01h                                                                                                                                                                                                 | COB-ID Used by PDO |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                               | N/A                | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. It is recommended to use the default value. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1420.02h                                                                                                                                                                                                                      | Transmission Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                     | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                                                     | 0 - 255           | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. It is recommended to use the default value. For details see <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1620h: 27<sup>th</sup> Receive PDO Mapping Parameter** This PDO is used to send the Command Limiter's maximum velocity values to the drive. This PDO is only used in profile

position mode (see object 6060h for modes of operation). The object mapped to this PDO is fixed and not user-selectable. See object 1420h for details on the transmission method.

| 1620.01h                                                                                                                                                                                                     | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                    | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                   | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Controlled Accel/Decel Maximum Speed: Config 0 object (203C.09h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1421h: 28<sup>th</sup> Receive PDO Communication Parameter** This PDO is valid in profile position mode only and does not exist in other modes. The COB-ID of this PDO can be set to any value. See object 1621h for details about the data transmitted by this PDO.

| 1421.01h                                                                                                                                                                                                 | COB-ID Used by PDO |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                               | N/A                | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. It is recommended to use the default value. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1421.02h                                                                                                                                                                                                                      | Transmission Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                     | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                                                                     | 0 - 255           | N/A   | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. It is recommended to use the default value. For details see <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1621h: 28<sup>th</sup> Receive PDO Mapping Parameter** This PDO is used to send the Command Limiter's maximum acceleration and deceleration values to the drive. This PDO is only used in profile position mode (see object 6060h for modes of operation). The object mapped to this PDO is fixed and not user-selectable. See object 1421h for details on the transmission method.

| 1621.01h                                                                                                                                                                                                            | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                           | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                          | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Controlled Accel/Decel Maximum Acceleration: Config 0 object (203C.0Ah). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1621.02h                                                                                                                                                                                                            | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                           | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                          | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Controlled Accel/Decel Maximum Deceleration: Config 0 object (203C.0Bh). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1800h: 1<sup>st</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A00h for details about the data transmitted by this PDO.

| 1800.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27</a> . |                    |       |               |               |

| 1800.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28</a> . |                   |       |               |               |

**1A00h: 1<sup>st</sup> Transmit PDO Mapping Parameter** This PDO transmits drive status information. The object mapped to this PDO is fixed and not user selectable. See object 1800h for details on the transmission method.

| 1A00.01h                                                                                                                                                              | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                            | 0 - 2 <sup>32</sup>                                    | N/A   | Read Only     | Yes           |
| <b>Description:</b><br>Maps the StatusWord object (6041h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1802h: 3<sup>rd</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the

sub-indices of this object are configured appropriately. See object 1A02h for details about the data transmitted by this PDO.

| 1802.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1802.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">"Transmission Type" on page 28</a> . |                   |       |               |               |

**1A02h: 3<sup>rd</sup> Transmit PDO Mapping Parameter** This PDO transmits drive status information and the actual position value stored in the drive. The objects mapped to this PDO are fixed and not user selectable. See object 1802h for details on the transmission method.

| 1A02.01h                                                                                                                                                              | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                            | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the StatusWord object (6041h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A02.02h                                                                                                                                                                         | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                       | 0 – 255                                                | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Position Value object (6064h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

**1803h: 4<sup>th</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A03h for details about the data transmitted by this PDO.

| 1803.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27</a> . |                    |       |               |               |

| 1803.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1A03h: 4<sup>th</sup> Transmit PDO Mapping Parameter** This PDO transmits drive status information and the actual velocity value stored in the drive. The objects mapped to this PDO are fixed and not user selectable. See object 1803h for details on the transmission method.

| 1A03.01h                                                                                                                                                             | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                           | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the StatusWord object (6041h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

| 1A03.02h                                                                                                                                                                        | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                      | 0 – 255                                                | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Velocity Value object (606Ch). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

**1804h: 5<sup>th</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A04h for details about the data transmitted by this PDO.

| 1804.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27.</a> |                    |       |               |               |

| 1804.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |



**1A04h: 5<sup>th</sup> Transmit PDO Mapping Parameter** This PDO transmits drive status information and the actual torque value stored in the drive. The objects mapped to this PDO are fixed and not user selectable. See object 1804h for details on the transmission method.

| 1A04.01h                                                                                                                                                             | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                           | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the StatusWord object (6041h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28.</a> |                                                        |       |               |               |

| 1A04.02h                                                                                                                                                                       | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                      | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                     | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Current Value object (6077h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28.</a> |                                                        |       |               |               |

**1814h: 21<sup>st</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A14h for details about the data transmitted by this PDO.

| 1814.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">"Setting COB-ID's for each PDO" on page 27.</a> |                    |       |               |               |

| 1814.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">"Transmission Type" on page 28.</a> |                   |       |               |               |

**1A14h: 21<sup>st</sup> Transmit PDO Mapping Parameter** This PDO transmits the actual position value stored in the drive. The object mapped to this PDO is fixed and not user selectable. See object 1814h for details on the transmission method.

| 1A14.01h                                                                                                                                                                        | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                      | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Position Value object (6064h). For details about the format of this sub-index see <a href="#">"Mapping Parameter Object" on page 28.</a> |                                                        |       |               |               |

**1815h: 22<sup>nd</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A15h for details about the data transmitted by this PDO.

| 1815.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27.</a> |                    |       |               |               |

| 1815.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1A15h: 22<sup>nd</sup> Transmit PDO Mapping Parameter** This PDO transmits the actual velocity value stored in the drive. The object mapped to this PDO is fixed and not user selectable. See object 1815h for details on the transmission method.

| 1A15.01h                                                                                                                                                                        | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                      | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Velocity Value object (606Ch). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

**1816h: 23<sup>rd</sup> Transmit PDO Communication Parameter** This PDO is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h), can be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A16h for details about the data transmitted by this PDO.

| 1816.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27.</a> |                    |       |               |               |

| 1816.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1A16h: 23<sup>rd</sup> Transmit PDO Mapping Parameter** This PDO transmits the actual torque value stored in the drive. The object mapped to this PDO is fixed and not user selectable. See object 1816h for details on the transmission method.

| 1A16.01h                                                                                                                                                                       | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                      | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                     | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Actual Current Value object (6077h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28.</a> |                                                        |       |               |               |

**1817h: 24<sup>th</sup> Transmit PDO Communication Parameter** This PDO is applicable to interpolated position mode only (see object 6060h for operating modes) and is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h). The PDO can also be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A17h for details about the data transmitted by this PDO.

| 1817.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27.</a> |                    |       |               |               |

| 1817.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1A17h: 24<sup>th</sup> Transmit PDO Mapping Parameter** This PDO transmits information about the status of the PVT buffer in the drive. The PDO is only useful when the drive is in

interpolated position mode (see object 6060h for operating modes). The object mapped to this PDO is fixed and not user selectable. See object 1817h for details on the transmission method.

| 1A17.01h                                                                                                                                                                                                              | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                            | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Buffer Position of the Interpolation Data Configuration object (60C4.04h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1818h: 25<sup>th</sup> Transmit PDO Communication Parameter** This PDO is applicable to all operating modes (see object 6060h for operating modes) and is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h). The PDO can also be transmitted upon a SYNC message or when an RTR is received if the sub-indices of this object are configured appropriately. See object 1A18h for details about the data transmitted by this PDO.

| 1818.01h                                                                                                                                                     | COB-ID Used By PDO |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                   | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27</a> . |                    |       |               |               |

| 1818.02h                                                                                                                                                                          | Transmission Type |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                         | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28</a> . |                   |       |               |               |

**1A18h: 25<sup>th</sup> Transmit PDO Mapping Parameter** This PDO transmits information about the status of the programmable and dedicated digital inputs on the drive. The objects mapped to this PDO are fixed and not user selectable. See object 1818h for details on the transmission method.

| 1A18.01h                                                                                                                                                                           | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                         | N/A                                                    | N/A   | Read Only     | No            |
| <b>Description:</b><br>Maps the Digital Input Values object (2023.01h). For details about the format of this sub-index see <a href="#">“Mapping Parameter Object” on page 28</a> . |                                                        |       |               |               |

**1819h: 26<sup>th</sup> Transmit PDO Communication Parameter** This PDO is applicable to all operating modes (see object 6060h for operating modes) and is transmitted upon a user configurable event (see objects 2120h – 2125h, 2130h – 2133h, 2140h – 2147h and 2150h – 2153h). The PDO can also be transmitted upon a SYNC message or when an RTR is received if

the sub-indices of this object are configured appropriately. See object 1A19h for details about the data transmitted by this PDO.

| 1819.01h                                                                                                                                                    | COB-ID Used By PDO |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                  | N/A                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Holds the COB-ID of the PDO as well as other parameters. For details see <a href="#">“Setting COB-ID's for each PDO” on page 27.</a> |                    |       |               |               |

| 1819.02h                                                                                                                                                                         | Transmission Type |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned8                                                                                                                                                                        | 0 – 255           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the way in which the PDO will be transmitted, namely synchronous or asynchronous. For details see <a href="#">“Transmission Type” on page 28.</a> |                   |       |               |               |

**1A19h: 26<sup>th</sup> Transmit PDO Mapping Parameter** This PDO transmits up to 8 user specified objects defined by the sub-indices below. Any object in this object dictionary may be mapped to one of these sub-indices; there is no restriction other than data size. If a large object, such as a 32-byte string, is mapped to TDD026, it simply will not transmit when triggered. Generally it is most useful to map numerical data to this TPDO.



Sub-index 0 (1A19.00h) must reflect the number of configured mapping sub-indices. If sub-index 0 is left at its default value of 0, TPDO26 will not transmit.

The total number of bytes TPDO26 can transmit is 8. If, across all the sub-indices, more than 8 bytes are assigned to transmit, TPDO26 will not transmit.

- Example 1: Map 8 objects to all 8 sub-indices of TPDO26. Each object only has 8 bits of data, therefore the total bytes to transmit = 8. In this case TPDO26 will transmit and the data will appear sub-index 1 = byte 1, sub-index 2 = byte 2 and so on.
- Example 2: Map 2 objects, each a 32-bit object, to sub-indices 1 and 2. In this case TPDO26 will transmit and the data will appear sub-index 1 = bytes 1-4, sub-index 2 = bytes 5-8.
- Example 3: Map 3 objects, two 32-bit objects and one 16-bit object to sub-indices 1, 2, and 3. In this case TPDO26 will not transmit because the total number of bytes assigned to transmit exceeds 8.

See object 1819h for details on setting the transmission method.

| 1A19.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 1 <sup>st</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 1$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 2 <sup>nd</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 2$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 3 <sup>rd</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 3$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 4 <sup>th</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 4$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.05h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 5 <sup>th</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 5$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.06h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 6 <sup>th</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 6$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.07h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 7 <sup>th</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 7$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

| 1A19.08h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PDO Mapping for the 8 <sup>th</sup> Application Object |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Identifies an object that TPDO26 will transmit data from when triggered. It is important to note that TPDO26 only has 8 available data bytes to transmit information with. If sub-indices 1A19.01h through 1A19.08h contain objects such that the total number of bytes to transmit is greater than 8, TPDO26 will not transmit any data.<br><br>To enable this mapping, 1A19.00h must be set to $\geq 8$ .<br><br>For details about formatting data for this sub-index see <a href="#">"Mapping Parameter Object" on page 28</a> . |                                                        |       |               |               |

### 2122h: TPDO Timer1 Next Processing Time

| 2122h                                                                                                                            | TPDO Timer1 Next Processing Time |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                       | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                       | 0 – 2 <sup>32</sup>              | milliseconds (ms) | Read          | No            |
| <b>Description:</b><br>Contains the time of the next Timer1 event with respect to the total drive run time as seen by the drive. |                                  |                   |               |               |

### 2125h: TPDO Timer2 Next Processing Time

| 2125h                                                                                                                            | TPDO Timer2 Next Processing Time |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                       | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                       | 0 – 2 <sup>32</sup>              | milliseconds (ms) | Read          | No            |
| <b>Description:</b><br>Contains the time of the next Timer2 event with respect to the total drive run time as seen by the drive. |                                  |                   |               |               |



**2133h: TPDO Value-Changed Object Last Value**

| 2133h                                                                                                                                                      | TPDO Value-Changed Object Last Value |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                  | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                 | 0 – 2 <sup>32</sup>                  | N/A   | Read Only     | No            |
| <b>Description:</b><br>Consists of the value of the observed object, defined by 2130h, from the last TPDO transmission triggered by a Value-Changed event. |                                      |       |               |               |

**2143h: TPDO Bits-Changed\_1 Object Last Value**

| 2143h                                                                                                                                                                  | TPDO Bits-Changed_1 Object Last Value |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | 0 – 2 <sup>32</sup>                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>This object consists of the value of the observed object, defined by 2140h, from the last TPDO transmission triggered by a Bits-Changed1 event. |                                       |       |               |               |

**2147h: TPDO Bits-Changed\_2 Object Last Value**

| 2147h                                                                                                                                                                  | TPDO Bits-Changed_2 Object Last Value |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                             | 0 – 2 <sup>32</sup>                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>This object consists of the value of the observed object, defined by 2144h, from the last TPDO transmission triggered by a Bits-Changed2 event. |                                       |       |               |               |

**20E8h: TPDO Timer Configuration**

| 20E8.01h                                                                                                                                                                            | TPDO Timer1 Cycle Time |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                           | Data Range             | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                          | 0 – 2 <sup>32</sup>    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the cycle time of the assigned TPDOs (assigned in object 20E8.02h). If the cycle time is set to 0, the assigned TPDOs will be transmitted continuously. |                        |                   |               |               |

| 20E8.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Timer1 Assigned TPDOs                  |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 1FFh                                    | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Timer1. If this object is set to 0, Timer1 will stop.                                                                                                                                                                                                                                                                                                                                                                                              |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

| 20E8.03h                                                                                                                                                        | TPDO TPDO Timer 2 Assigned TPDO's |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                        | Units             | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                      | 0 – 2 <sup>32</sup>               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the cycle time of the assigned TPDOs for Timer2. If the cycle time is set to 0, the assigned TPDOs will be transmitted continuously |                                   |                   |               |               |

| 20E8.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Timer2 Assigned TPDOs                  |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 1FFh                                    | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Timer 2. If this object is set to 0, Timer 2 will stop.                                                                                                                                                                                                                                                                                                                                                                                            |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

**20E7h: TPDO Value-Changed Configuration**

| 20E7.01h                                                                                                                                                                                                                                                                                                                                                                                                                        | TPDO Value-Changed Object ID |                    |               |               |       |       |       |       |           |                    |                    |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------|---------------|---------------|-------|-------|-------|-------|-----------|--------------------|--------------------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                   | Units              | Accessibility | Stored to NVM |       |       |       |       |           |                    |                    |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 2 <sup>32</sup>          | N/A                | Read / Write  | No            |       |       |       |       |           |                    |                    |          |
| <b>Description:</b><br>Contains the Object ID of the object to observe continuously. After a user specified value change of this object (set via object 2131h), the assigned TPDOs will be sent (assigned via object 20E7h). Use the three objects (20E7.01h, 20E7.02h, 20E7.03h) to monitor any object and send assigned TPDOs after a desired value change. Use the format in the table below to specify the observed object. |                              |                    |               |               |       |       |       |       |           |                    |                    |          |
| <table><tr><td>Byte0</td><td>Byte1</td><td>Byte2</td><td>Byte3</td></tr><tr><td>Sub-index</td><td>Object Index (LSB)</td><td>Object Index (MSB)</td><td>Always 0</td></tr></table>                                                                                                                                                                                                                                              |                              |                    |               |               | Byte0 | Byte1 | Byte2 | Byte3 | Sub-index | Object Index (LSB) | Object Index (MSB) | Always 0 |
| Byte0                                                                                                                                                                                                                                                                                                                                                                                                                           | Byte1                        | Byte2              | Byte3         |               |       |       |       |       |           |                    |                    |          |
| Sub-index                                                                                                                                                                                                                                                                                                                                                                                                                       | Object Index (LSB)           | Object Index (MSB) | Always 0      |               |       |       |       |       |           |                    |                    |          |

| 20E7.02h                                                                                                                                                                                                                                                                                                                                                                                                                                         | TPDO Value-Changed Delta Value |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                        | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0 – 2 <sup>32</sup>            | N/A   | Read / Write  | No            |
| <b>Description:</b><br>Sets the amount of change of the observed object (defined by 20E7h) that will cause the assigned Transmit PDOs to be sent (assigned via object 20E7.03h). Use the three objects (20E7.01h, 20E7.02h, 20E7.03h) to monitor any object and send assigned TPDOs after a desired value change. Setting this value to zero disables the functionality. The meaning of the value in this object depends on the observed object. |                                |       |               |               |

| 20E7.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Value-Changed Assigned TPDOs           |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 1FFh                                    | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Value-Changed event. If this object is set to 0, Timer 1 will stop.                                                                                                                                                                                                                                                                                                                                                                                |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

| 20E7.04h                                                                                                                                                                                                                                                                                                                                               | TPDO Bits-Changed_1 Object ID |                    |               |               |       |       |       |       |           |                    |                    |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------|---------------|---------------|-------|-------|-------|-------|-----------|--------------------|--------------------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                              | Data Range                    | Units              | Accessibility | Stored to NVM |       |       |       |       |           |                    |                    |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                             | 0 – 2 <sup>32</sup>           | N/A                | Read / Write  | Yes           |       |       |       |       |           |                    |                    |          |
| <b>Description:</b><br>Identifies a CANopen object which is observed continuously for bit changing. If the observed bits change, the assigned TPDOs will be sent. The observed bits are defined by a bit mask in object 20E7h while the assigned TPDOs are defined by object 20E7.h. Use the format in the table below to specify the observed object. |                               |                    |               |               |       |       |       |       |           |                    |                    |          |
| <table><tr><td>Byte0</td><td>Byte1</td><td>Byte2</td><td>Byte3</td></tr><tr><td>Sub-index</td><td>Object Index (LSB)</td><td>Object Index (MSB)</td><td>Always 0</td></tr></table>                                                                                                                                                                     |                               |                    |               |               | Byte0 | Byte1 | Byte2 | Byte3 | Sub-index | Object Index (LSB) | Object Index (MSB) | Always 0 |
| Byte0                                                                                                                                                                                                                                                                                                                                                  | Byte1                         | Byte2              | Byte3         |               |       |       |       |       |           |                    |                    |          |
| Sub-index                                                                                                                                                                                                                                                                                                                                              | Object Index (LSB)            | Object Index (MSB) | Always 0      |               |       |       |       |       |           |                    |                    |          |

| 20E7.05h                                                                                                                                                                                                                                 | TPDO Bits-Changed_1 Object Bit Mask |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                               | 0 – 2 <sup>32</sup>                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Bit mask to identify which bits are observed in the object identified in 2140h. If the observed bits change the assigned TPDOs are sent. If this variable is set to 0 the identified object will not be observed. |                                     |       |               |               |

| 20E7.06h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Bits-Changed_1 Assigned TPDOs          |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 2 <sup>32</sup>                         | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Bits-Changed1 event. If this object is set to a value of 0, the object identified in 20E7h will not be observed.                                                                                                                                                                                                                                                                                                                                   |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

| 20E7.07                                                                                                                                                                                                                                                                                                                                                                    | TPDO Bits-Changed_2 Object ID |                    |               |               |       |       |       |       |           |                    |                    |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------|---------------|---------------|-------|-------|-------|-------|-----------|--------------------|--------------------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                  | Data Range                    | Units              | Accessibility | Stored to NVM |       |       |       |       |           |                    |                    |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                 | 0 – 2 <sup>32</sup>           | N/A                | Read / Write  | Yes           |       |       |       |       |           |                    |                    |          |
| <b>Description:</b><br>This object is used to identify a CANopen object which is observed continuously for bit changing. If the observed bits change, the assigned TPDOs will be sent. The observed bits are defined by a bit mask in object 20E7h while the assigned TPDOs are defined by object 20E7h. Use the format in the table below to specify the observed object. |                               |                    |               |               |       |       |       |       |           |                    |                    |          |
| <table><tr><td>Byte0</td><td>Byte1</td><td>Byte2</td><td>Byte3</td></tr><tr><td>Sub-index</td><td>Object Index (LSB)</td><td>Object Index (MSB)</td><td>Always 0</td></tr></table>                                                                                                                                                                                         |                               |                    |               |               | Byte0 | Byte1 | Byte2 | Byte3 | Sub-index | Object Index (LSB) | Object Index (MSB) | Always 0 |
| Byte0                                                                                                                                                                                                                                                                                                                                                                      | Byte1                         | Byte2              | Byte3         |               |       |       |       |       |           |                    |                    |          |
| Sub-index                                                                                                                                                                                                                                                                                                                                                                  | Object Index (LSB)            | Object Index (MSB) | Always 0      |               |       |       |       |       |           |                    |                    |          |

| 20E7.08h                                                                                                                                                                                                                                                           | TPDO Bits-Changed_2 Object Bit Mask |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                         | 0 – 2 <sup>32</sup>                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>This object consists of a bit mask to identify which bits are observed in the object identified in 20E7h. If the observed bits change the assigned TPDOs are sent. If this variable is set to 0 the identified object will not be observed. |                                     |       |               |               |

| 20E7.09h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Bits-Changed_2 Assigned TPDOs          |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 2 <sup>32</sup>                         | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Bits-Changed2 event. If this object is set to a value of 0, the object identified in 2144h will not be observed.                                                                                                                                                                                                                                                                                                                                   |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

| 20E7.0Ah                                                                                                                                                                                                                                                                                                                                                                        | TPDO Value-Reached Object ID |                    |               |               |       |       |       |       |           |                    |                    |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------|---------------|---------------|-------|-------|-------|-------|-----------|--------------------|--------------------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                       | Data Range                   | Units              | Accessibility | Stored to NVM |       |       |       |       |           |                    |                    |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                      | 0 – 2 <sup>32</sup>          | N/A                | Read / Write  | Yes           |       |       |       |       |           |                    |                    |          |
| <b>Description:</b><br>This object is used to identify a CANopen object which is observed continuously for changing. If the value of the observed object reaches a predefined value, the assigned TPDOs will be sent. The predefined value is defined in 2151h while the assigned TPDOs are defined in 2152h. Use the format in the table below to specify the observed object. |                              |                    |               |               |       |       |       |       |           |                    |                    |          |
| <table><tr><td>Byte0</td><td>Byte1</td><td>Byte2</td><td>Byte3</td></tr><tr><td>Sub-index</td><td>Object Index (LSB)</td><td>Object Index (MSB)</td><td>Always 0</td></tr></table>                                                                                                                                                                                              |                              |                    |               |               | Byte0 | Byte1 | Byte2 | Byte3 | Sub-index | Object Index (LSB) | Object Index (MSB) | Always 0 |
| Byte0                                                                                                                                                                                                                                                                                                                                                                           | Byte1                        | Byte2              | Byte3         |               |       |       |       |       |           |                    |                    |          |
| Sub-index                                                                                                                                                                                                                                                                                                                                                                       | Object Index (LSB)           | Object Index (MSB) | Always 0      |               |       |       |       |       |           |                    |                    |          |

| 20E7.0Bh                                                                                                                                                                                                                   | TPDO Value-Reached  |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                  | Data Range          | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                 | 0 – 2 <sup>32</sup> | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>This object consists of a predefined value to compare with the value of an observed object identified in 20E7h. If the value of the observed object reaches this value the assigned TPDOs are sent. |                     |       |               |               |

| 20E7.0Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TPDO Value-Reached Assigned TPDOs           |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------------------|---|--------|---|--------|---|--------|---|--------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – 2 <sup>32</sup>                         | N/A   | Read / Write  | Yes           |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <b>Description:</b><br>Assigns TPDOs to Value-Reached event. If this object is set to a value of 0, the object identified in 2150h will not be observed.                                                                                                                                                                                                                                                                                                                                   |                                             |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| <table><tr><th>Bit</th><th>Assignment (1 = assigned, 0 = not assigned)</th></tr><tr><td>0</td><td>TPDO 1</td></tr><tr><td>1</td><td>TPDO 3</td></tr><tr><td>2</td><td>TPDO 4</td></tr><tr><td>3</td><td>TPDO 5</td></tr><tr><td>4</td><td>TPDO 21</td></tr><tr><td>5</td><td>TPDO 22</td></tr><tr><td>6</td><td>TPDO 23</td></tr><tr><td>7</td><td>TPDO 24</td></tr><tr><td>8</td><td>TPDO 25</td></tr><tr><td>9</td><td>TPDO 26</td></tr><tr><td>10-31</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Assignment (1 = assigned, 0 = not assigned) | 0 | TPDO 1 | 1 | TPDO 3 | 2 | TPDO 4 | 3 | TPDO 5 | 4 | TPDO 21 | 5 | TPDO 22 | 6 | TPDO 23 | 7 | TPDO 24 | 8 | TPDO 25 | 9 | TPDO 26 | 10-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assignment (1 = assigned, 0 = not assigned) |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 1                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 3                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 4                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 5                                      |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 21                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 22                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 23                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 24                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 25                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TPDO 26                                     |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |
| 10-31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                    |       |               |               |     |                                             |   |        |   |        |   |        |   |        |   |         |   |         |   |         |   |         |   |         |   |         |       |          |

| 20E7.0Dh                                                                                                                                                                                                                                                                                                                                                    | TPDO Value-Reached Direction |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                   | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                  | 0 – 2 <sup>16</sup>          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>If the value of this object is 0, the assigned TPDOs (defined by 2152h) are sent if the observed object (identified in 2150h) reaches the predefined value (set by 2151h) in the downward direction. Otherwise the assigned TPDOs are sent if the value of the observed object reaches the predefined value in the upward direction. |                              |       |               |               |

## 2.3 Drive Configuration

### 2.3.1 Motion Control Profile

#### 20D0h: Control Loop Configuration Parameters

| 20D0.01h                                                                                                                                                                                                                                                                                                                                                                                                                               | Control Loop Configuration |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Range                 | Units | Accessibility | Stored to NVM |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Control loop configuration. Drive setup and configuration software will determine the values in this parameter. For systems that do not load parameter values from non-volatile memory but rather download parameters to the drive upon each system initialization, this parameter should be read from the drive upon completion of setup and configuration and saved with all other relevant drive parameters. |                            |       |               |               |

#### 2076h: Analog Motor Feedback Parameters

| 2076.01h  | Commutation Configuration |       |               |               |
|-----------|---------------------------|-------|---------------|---------------|
| Data Type | Data Range                | Units | Accessibility | Stored to NVM |
| -         | -                         | -     | -             | -             |

| 2076.02h                                                                 | Commutation Counts  |       |               |               |
|--------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                | Data Range          | Units | Accessibility | Stored to NVM |
| Integer32                                                                | 0 - 2 <sup>30</sup> | N/A   | Read / Write  | No            |
| <b>Description:</b><br>The number of commutation counts per unit length. |                     |       |               |               |

| 2076.03h                                                                                                                                    | Pole Pairs per Unit Length |            |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|---------------|---------------|
| Data Type                                                                                                                                   | Data Range                 | Units      | Accessibility | Stored to NVM |
| Integer16                                                                                                                                   | 1 - 64                     | Pole Pairs | Read / Write  | No            |
| <b>Description:</b><br>The high byte specifies the integral number of pole pairs and the low byte specifies the fractional pole pair count. |                            |            |               |               |

| 2076.04h                                                                                         | Phase Resistance    |       |               |               |
|--------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - 2 <sup>15</sup> | Ohms  | Read / Write  | No            |
| <b>Description:</b><br>16bitS12 value used to specify the resistance of each phase of the motor. |                     |       |               |               |

| 2076.05h                                                                                         | Phase Inductance    |        |               |               |
|--------------------------------------------------------------------------------------------------|---------------------|--------|---------------|---------------|
| Data Type                                                                                        | Data Range          | Units  | Accessibility | Stored to NVM |
| Integer16                                                                                        | 0 - 2 <sup>15</sup> | Henrys | Read / Write  | No            |
| <b>Description:</b><br>16bitS14 value used to specify the inductance of each phase of the motor. |                     |        |               |               |

| 2076.06h                                                                                                                               | Null Torque Angle at Lower Bound |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                              | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                             | 0 - 360                          | DG1   | Read / Write  | No            |
| <b>Description:</b><br>Represents the Null torque angle when the value of the analog input is at the lower bound of the voltage range. |                                  |       |               |               |

| 2076.07h                                                                         | Counts per Full Scale |        |               |               |
|----------------------------------------------------------------------------------|-----------------------|--------|---------------|---------------|
| Data Type                                                                        | Data Range            | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                       | N/A                   | Counts | Read / Write  | No            |
| <b>Description:</b><br>The amount of counts per full scale of the voltage range. |                       |        |               |               |

| 2076.08h                                                                                                                                            | Analog Input Configuration |                                                                                                           |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                 | Units                                                                                                     | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                          | 0 - [2 <sup>(16)</sup> -1] | N/A                                                                                                       | Read / Write  | No            |
| <b>Description:</b><br>Allows the user to configure the operational behavior of the analog input. The bits of the structure are defined as follows: |                            |                                                                                                           |               |               |
| <b>Bits</b>                                                                                                                                         | <b>Name</b>                | <b>Description</b>                                                                                        |               |               |
| [0]                                                                                                                                                 | Invert Input               | Setting this bit effectively causes the normalized input voltage value to be multiplied by -1             |               |               |
| [1]                                                                                                                                                 | Rotary Input               | Setting this bit causes the analog input to "wrap around" one boundary to the other, used for rotary pots |               |               |
| [15:2]                                                                                                                                              | Reserved                   | This value <b>MUST</b> be zero                                                                            |               |               |



| 2076.09h                                                                                                           | Input Voltage Bounds   |                                                                                              |               |               |
|--------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                          | Data Range             | Units                                                                                        | Accessibility | Stored to NVM |
| Integer32                                                                                                          | N/A                    | N/A                                                                                          | Read / Write  | No            |
| <b>Description:</b><br>Contains the Upper and Lower bounds of the voltage range, whose structure is defined below: |                        |                                                                                              |               |               |
| Word #                                                                                                             | Name                   | Description                                                                                  |               |               |
| 0                                                                                                                  | Upper Voltage Boundary | The percentage of the full-scale input voltage that represents the most valid input voltage. |               |               |
| 1                                                                                                                  | Lower Voltage Boundary | The percentage of the full-scale input voltage that represents the most valid input voltage. |               |               |

| 2076.0Ah                                                                                                                                                            | Reference Frame Configuration       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                          | Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $2^{(16)} - 1$                  | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Read / Write  | No            |
| <b>Description:</b><br>Specifies how to use the selected number of position bits and whether to reflect the axis. The bits of the structure are defined as follows: |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |               |
| Bits                                                                                                                                                                | Name                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |               |
| [0]                                                                                                                                                                 | Enable Reflection over Encoder Axis | Allows the user to reflect the encoder axis about 0<br>0: Do NOT reflect axis: encoder position = (ref = 1)<br>1: Reflect the encoder axis: encoder position = ref (- 1)<br><br>encoder position = (ref) * raw encoder position + user offset                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |               |
| [1]                                                                                                                                                                 | Enable Absolute Encoder Modulo      | Allows the user to keep the monitored absolute position within the range of the analog input<br>0: Disable Modulo: The monitored Encoder position can go out of the range of the encoder<br>1: Enable Modulo: No matter how far the encoder moves in one direction, the value reported by the Absolute encoder position will always lie within the range:<br>encoder position = ((ref) * raw encoder position) % Range + Range Offset, where Range and Range Offset are specified by their respective sub-indexes.<br><br>It should be noted that the range value should be such that the maximum distance the encoder is expected to move should be less than half of the range. |               |               |
| [4:2]                                                                                                                                                               | Position Feedback Configuration     | Allows the user to specify how the drive's position frame of reference will be initialized when the feedback object is used for position feedback:<br>0: Pos = raw encoder position<br>1: Pos = raw encoder position + offset<br>2: Pos = -raw encoder position<br>3: Pos = -raw encoder position + offset<br>4: Pos = encoder position                                                                                                                                                                                                                                                                                                                                           |               |               |
| {15:5}                                                                                                                                                              | Reserved                            | Value MUST be 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |               |

| 2076.0Bh                                                                                                                                                                                    | Monitored Encoder Offset and Range |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                         | Units | Accessibility | Stored to NVM |
| Integer64                                                                                                                                                                                   | $-2^{31} - 2^{31}$                 | N/A   | Read / Write  | No            |
| <b>Description:</b><br>This is the range and offset values that are applied to the position that is read from the analog input. It allows the user to specify the absolute reference frame. |                                    |       |               |               |

| 2076.0Ch                                                                                                                                                                                                                            | Voltage Sense LFP Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                           | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                           | 0 - 1                         | N/A   | Read / Write  | No            |
| <b>Description:</b><br>Specifies the cutoff frequency characteristics of the single pole lowpass filter that is dedicated to the analog input based motor feedback. It is applied prior to the conversion to position and velocity. |                               |       |               |               |

| 2076.0Dh                                                                          | Motor Rated Current           |       |               |               |
|-----------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                         | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer16                                                                         | $[2^{(15)}] - [2^{(15)} - 1]$ | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the rated motor current. |                               |       |               |               |

### 2077h: Analog Motor Feedback Values

| 2077.01h                                                               | Raw Value  |       |               |               |
|------------------------------------------------------------------------|------------|-------|---------------|---------------|
| Data Type                                                              | Data Range | Units | Accessibility | Stored to NVM |
| Integer16                                                              | N/A        | N/A   | Read Only     | No            |
| <b>Description:</b><br>The raw value of the analog input from the ADC. |            |       |               |               |

| 2077.02h                                                            | Bounded Value |       |               |               |
|---------------------------------------------------------------------|---------------|-------|---------------|---------------|
| Data Type                                                           | Data Range    | Units | Accessibility | Stored to NVM |
| Integer16                                                           | N/A           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The raw value but bounded by a set boundary. |               |       |               |               |

| 2077.03h                                                                         | Analog Input Value Range |       |               |               |
|----------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                        | Data Range               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                       | N/A                      | N/A   | Read Only     | No            |
| <b>Description:</b><br>The value of the analog input converted to a range value. |                          |       |               |               |

| 2077.04h                                                                                  | Analog Input Value Absolute Range |       |               |               |
|-------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                 | Data Range                        | Units | Accessibility | Stored to NVM |
| Integer32                                                                                 | N/A                               | N/A   | Read Only     | No            |
| <b>Description:</b><br>The absolute value of the analog input converted to a range value. |                                   |       |               |               |

| 2077.05h                                                                    | Analog Position Counts Unsigned |       |               |               |
|-----------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                   | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                  | N/A                             | N/A   | Read Only     | No            |
| <b>Description:</b><br>The number of position counts from the analog input. |                                 |       |               |               |

| 2077.06h                                                                               | Analog Position Counts Signed |       |               |               |
|----------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer32                                                                              | N/A                           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The number of turns of the rotor, either forwards or backwards. |                               |       |               |               |

| 2077.07h                                                         | Monitored Encoder Position |        |               |               |
|------------------------------------------------------------------|----------------------------|--------|---------------|---------------|
| Data Type                                                        | Data Range                 | Units  | Accessibility | Stored to NVM |
| Integer32                                                        | N/A                        | Counts | Read Only     | No            |
| <b>Description:</b><br>The monitored encoder raw position value. |                            |        |               |               |

| 2077.08h                                              | Captured Encoder Position |        |               |               |
|-------------------------------------------------------|---------------------------|--------|---------------|---------------|
| Data Type                                             | Data Range                | Units  | Accessibility | Stored to NVM |
| Integer32                                             | N/A                       | Counts | Read Only     | No            |
| <b>Description:</b><br>The captured encoder position. |                           |        |               |               |

**202Fh: AC Induction Motor Parameters**

| 202F.01h                                                                                                             | AC Induction Motor - Current |                                                                                         |               |               |
|----------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                            | Data Range                   | Units                                                                                   | Accessibility | Stored to NVM |
| Structure                                                                                                            | N/A                          | Current Structure Units                                                                 | Read / Write  | No            |
| <b>Description:</b><br>This object is a 2-word structure containing current parameters unique to an induction motor. |                              |                                                                                         |               |               |
|                                                                                                                      |                              | Parameter                                                                               |               |               |
| Word 0                                                                                                               |                              | The rated peak line current used to compute the AC induction slip coefficients.         |               |               |
| Word 1                                                                                                               |                              | The no-load magnetization current used to compute the internal AC induction parameters. |               |               |

| 202F.02h                                                                                                           | AC Induction Motor - Speed |                                                                     |               |               |
|--------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                          | Data Range                 | Units                                                               | Accessibility | Stored to NVM |
| Structure                                                                                                          | N/A                        | Speed Structure Units                                               | Read / Write  | No            |
| <b>Description:</b><br>This object is a 3-word structure containing speed parameters unique to an induction motor. |                            |                                                                     |               |               |
|                                                                                                                    |                            | Parameter                                                           |               |               |
| Word 0                                                                                                             |                            | The specified rated line frequency in Hz of the AC induction motor. |               |               |
| Word 1                                                                                                             |                            | The rotor no-load base speed (electrical cycles per minute).        |               |               |
| Word 2                                                                                                             |                            | The field weakening threshold speed (electrical cycles per minute). |               |               |

**2070h: Incremental Encoder #1 Motor Feedback**

| 2070.01h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2070.02h                                                                                                  | Incremental Encoder #1 - Commutation Counts per Unit Length |        |               |               |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                 | Data Range                                                  | Units  | Accessibility | Stored to NVM |
| Unsigned32                                                                                                | 0 – $2^{(30)}-1$                                            | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of quadrature counts per unit length. |                                                             |        |               |               |

| 2070.03h                                                                                           | Incremental Encoder #1 - Pole Pairs per Unit Length |        |               |               |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                          | Data Range                                          | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 1-64                                                | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of pole pairs per unit length. |                                                     |        |               |               |

| 2070.04h                                                                                            | Incremental Encoder #1 - Motor Phase Resistance |       |               |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                           | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                          | 0 – $[2^{(16)}-1]$                              | ohms  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the resistance of each phase of the motor. |                                                 |       |               |               |

| 2070.05h                                                                                            | Incremental Encoder #1 - Motor Phase Inductance |        |               |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                           | Data Range                                      | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                          | 0 – $[2^{(16)}-1]$                              | Henrys | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the inductance of each phase of the motor. |                                                 |        |               |               |

| 2070.06h                                                                                                                      | Incremental Encoder #1 - Null Torque Sync Angle #1 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                    | 0 – $[2^{(16)}-1]$                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Null Torque Angle of the first of the two synchronization edges. |                                                    |       |               |               |

| 2070.07h                                                                                                                       | Incremental Encoder #1 - Null Torque Sync Angle #2 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                      | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                     | 0 – $[2^{(16)}-1]$                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Null Torque Angle of the second of the two synchronization edges. |                                                    |       |               |               |

| 2070.08h                                                                                                                                     | Incremental Encoder #1 - Commutation Angle Error Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                   | 0 – $[2^{(16)}-1]$                                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the error angle that will be tolerated before a commutation sync error is reported. |                                                        |       |               |               |

| 2070.09h                                                                                                                                                  | Incremental Encoder #1 - Maximum Commutation Angle Error Adjustment |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                | 0 – $[2^{(16)}-1]$                                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the maximum amount of phase angle correction that may be applied per each synchronization event. |                                                                     |       |               |               |

| 2070.0Ah                                                                                             | Incremental Encoder #1 - Hall State Table |                             |               |               |
|------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------|---------------|---------------|
| Data Type                                                                                            | Data Range                                | Units                       | Accessibility | Stored to NVM |
| N/A                                                                                                  | 0 – [2 <sup>(16)</sup> -1]                | N/A                         | Read / Write  | Yes           |
| <b>Description:</b><br>Contains an array listing the optimum torque angle for each valid Hall state. |                                           |                             |               |               |
|                                                                                                      |                                           | Torque Angle Default Values |               |               |
| Hall State Value                                                                                     | Hex                                       | Degrees                     |               |               |
| 0                                                                                                    | 0x0000                                    | 0                           |               |               |
| 1                                                                                                    | 0x4000                                    | 90                          |               |               |
| 2                                                                                                    | 0XEAAB                                    | 330                         |               |               |
| 3                                                                                                    | 0x1555                                    | 30                          |               |               |
| 4                                                                                                    | 0x9555                                    | 210                         |               |               |
| 5                                                                                                    | 0x6AAB                                    | 150                         |               |               |
| 6                                                                                                    | 0xC000                                    | 290                         |               |               |
| 7                                                                                                    | 0x000                                     | 0                           |               |               |

| 2070.0Bh                                                                                                                                                                                                                                                                                                                                                                                                                                           | Incremental Encoder #1 - Low Speed Estimator Gain |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                          | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0 – $[2^{(32)}-1]$                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the $K_{vj}$ value used by the Low Speed Estimator when the encoder is used as a velocity feedback source.<br>This value can be calculated from the ACE value as follows:<br>$(\text{Low Speed Smoothing}) \times (50/3) \times (\text{Encoder\_Cts/Rev}) \times (C_{pk}) \times (65536/(V_{vel}^2))$ , where:<br>$V_{vel}$ = (Switching Frequency/2)<br>$C_{pk}$ = Hardware Peak Current |                                                   |       |               |               |

| 2070.0Ch                                                                                                                                                                                                                                                 | Incremental Encoder #1 - NTAD Selection Enum |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|----------------------------------------|--|-------------|-------|----------------|---|-------------|---|---------------|---|
| Data Type                                                                                                                                                                                                                                                | Data Range                                   | Units | Accessibility | Stored to NVM |                                        |  |             |       |                |   |             |   |               |   |
| N/A                                                                                                                                                                                                                                                      | 0-2                                          | N/A   | Read / Write  | Yes           |                                        |  |             |       |                |   |             |   |               |   |
| <b>Description:</b><br>Selects from one of the three Null Torque Angle Determination methods.                                                                                                                                                            |                                              |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| <table><tr><th colspan="2">Null Torque Angle Determination Method</th></tr><tr><th>Description</th><th>Value</th></tr><tr><td>Wake and Shake</td><td>0</td></tr><tr><td>Slam and Go</td><td>1</td></tr><tr><td>Sweep the Leg</td><td>2</td></tr></table> |                                              |       |               |               | Null Torque Angle Determination Method |  | Description | Value | Wake and Shake | 0 | Slam and Go | 1 | Sweep the Leg | 2 |
| Null Torque Angle Determination Method                                                                                                                                                                                                                   |                                              |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Description                                                                                                                                                                                                                                              | Value                                        |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Wake and Shake                                                                                                                                                                                                                                           | 0                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Slam and Go                                                                                                                                                                                                                                              | 1                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Sweep the Leg                                                                                                                                                                                                                                            | 2                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |

| 2070.0Dh                                                                                                                                                                           | Incremental Encoder #1 - Maximum Amount of NTAD Movement Allowed |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                         | 0 – $2^{16}-1$                                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the amount of movement allowed (per unit length) during the execution of certain Null Torque Angle Determination methods. |                                                                  |       |               |               |

| 2070.0Eh                                                                                                                                                                                                                                      | Incremental Encoder #1 - Maximum Torque Current Allowed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                     | Data Range                                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                    | 0 – $2^{16}-1$                                          | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the maximum amount of torque producing current to be used during any of the Null Torque Angle Determination methods. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                                         |       |               |               |

| 2070.0Fh                                                                                                                                                                                    | Incremental Encoder #1 - Lock Time |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{16}-1$                     | ms    | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of milliseconds to lock the rotor in a null torque position at the end of a successful Null Torque Angle Determination. |                                    |       |               |               |

| 2070.10h                                                                                                                                                                                              | Incremental Encoder #1 - Internal Retry Brake Time |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                             | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                            | 0 – $2^{16}-1$                                     | ms    | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of milliseconds to apply the dynamic brake to stop any motion between consecutive Null Torque Angle Determination retry attempts. |                                                    |       |               |               |

| 2070.11h                                                                          | Incremental Encoder #1 - Motor Rated Current |       |               |               |
|-----------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                         | $[-2^{15}]$ – $[2^{15}-1]$                   | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the rated motor current. |                                              |       |               |               |

| 2070.12h                                                                                                                                                                                 | Incremental Encoder #1 - NTAD Start Angle |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0-360                                     | DG1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the initial electrical angle used at the start of Phase Detect. This value can only be written when Phase Detect is not active. |                                           |       |               |               |

| 2070.13h                                                                                                                                                                                                                                                                         | Incremental Encoder #1 - Velocity Sense Configuration |                                                                                        |               |               |      |      |             |   |                     |                                                                                        |        |          |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------|---------------|---------------|------|------|-------------|---|---------------------|----------------------------------------------------------------------------------------|--------|----------|-----------|
| Data Type                                                                                                                                                                                                                                                                        | Data Range                                            | Units                                                                                  | Accessibility | Stored to NVM |      |      |             |   |                     |                                                                                        |        |          |           |
| Structure                                                                                                                                                                                                                                                                        | N/A                                                   | N/A                                                                                    | Read / Write  | Yes           |      |      |             |   |                     |                                                                                        |        |          |           |
| <b>Description:</b><br>Contains a structure used to configure the velocity sense for Incremental Encoder #1                                                                                                                                                                      |                                                       |                                                                                        |               |               |      |      |             |   |                     |                                                                                        |        |          |           |
| <table><tr><th>Bits</th><th>Name</th><th>Description</th></tr><tr><td>0</td><td>Low Speed Estimator</td><td>0: The Low Speed Estimate is Active (default)<br/>1:The Low Speed Estimator is inactive</td></tr><tr><td>1...15</td><td>Reserved</td><td>Must be 0</td></tr></table> |                                                       |                                                                                        |               |               | Bits | Name | Description | 0 | Low Speed Estimator | 0: The Low Speed Estimate is Active (default)<br>1:The Low Speed Estimator is inactive | 1...15 | Reserved | Must be 0 |
| Bits                                                                                                                                                                                                                                                                             | Name                                                  | Description                                                                            |               |               |      |      |             |   |                     |                                                                                        |        |          |           |
| 0                                                                                                                                                                                                                                                                                | Low Speed Estimator                                   | 0: The Low Speed Estimate is Active (default)<br>1:The Low Speed Estimator is inactive |               |               |      |      |             |   |                     |                                                                                        |        |          |           |
| 1...15                                                                                                                                                                                                                                                                           | Reserved                                              | Must be 0                                                                              |               |               |      |      |             |   |                     |                                                                                        |        |          |           |



**2071h: Incremental Encoder #1 Feedback Values**

| 2071.01h                                                                                           | Incremental Encoder #1 - Encoder Position |        |               |               |
|----------------------------------------------------------------------------------------------------|-------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                          | Data Range                                | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                          | $[-2^{(31)}] - [2^{(31)}-1]$              | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the position reported by the incremental encoder connected to FB2. |                                           |        |               |               |

| 2071.02h                                                                                                                                                                | Incremental Encoder #1 - Position Index Capture Value |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                            | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                               | $[-2^{(31)}] - [2^{(31)}-1]$                          | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the position of the last encoder index captured by the drive for the incremental encoder connected to FB2. Requires encoder with index. |                                                       |        |               |               |

**2072h: Incremental Encoder #2 Motor Feedback**

| 2072.01h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2072.02h                                                                                                  | Incremental Encoder #2 - Commutation Counts per Unit Length |        |               |               |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                 | Data Range                                                  | Units  | Accessibility | Stored to NVM |
| Unsigned32                                                                                                | $0 - [2^{(32)}-1]$                                          | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of quadrature counts per unit length. |                                                             |        |               |               |

| 2072.03h                                                                                           | Incremental Encoder #2 - Pole Pairs per Unit Length |        |               |               |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                          | Data Range                                          | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 1-64                                                | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of pole pairs per unit length. |                                                     |        |               |               |

| 2072.04h                                                                                            | Incremental Encoder #2 - Motor Phase Resistance |       |               |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                           | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                          | $0 - [2^{(16)}-1]$                              | ohms  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the resistance of each phase of the motor. |                                                 |       |               |               |

| 2072.05h                                                                                            | Incremental Encoder #2 - Motor Phase Inductance |        |               |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                           | Data Range                                      | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                          | 0 – $2^{(16)}-1$                                | Henrys | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the inductance of each phase of the motor. |                                                 |        |               |               |

| 2072.06h                                                                                                                      | Incremental Encoder #2 - Null Torque Sync Angle #1 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                    | 0 – $2^{(16)}-1$                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Null Torque Angle of the first of the two synchronization edges. |                                                    |       |               |               |

| 2072.07h                                                                                                                       | Incremental Encoder #2 - Null Torque Sync Angle #2 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                      | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                     | 0 – $2^{(16)}-1$                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Null Torque Angle of the second of the two synchronization edges. |                                                    |       |               |               |

| 2072.08h                                                                                                                                     | Incremental Encoder #2 - Commutation Angle Error Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                   | 0 – $2^{(16)}-1$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the error angle that will be tolerated before a commutation sync error is reported. |                                                        |       |               |               |

| 2072.09h                                                                                                                                                  | Incremental Encoder #2 - Maximum Commutation Angle Error Adjustment |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                | 0 – $2^{(16)}-1$                                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the maximum amount of phase angle correction that may be applied per each synchronization event. |                                                                     |       |               |               |

| 2072.0Ah                                                                                             | Incremental Encoder #2 - Hall State Table |                             |               |               |
|------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------|---------------|---------------|
| Data Type                                                                                            | Data Range                                | Units                       | Accessibility | Stored to NVM |
| N/A                                                                                                  | 0 – [2 <sup>(16)</sup> -1]                | N/A                         | Read / Write  | Yes           |
| <b>Description:</b><br>Contains an array listing the optimum torque angle for each valid Hall state. |                                           |                             |               |               |
|                                                                                                      |                                           | Torque Angle Default Values |               |               |
| Hall State Value                                                                                     | Hex                                       | Degrees                     |               |               |
| 0                                                                                                    | 0x0000                                    | 0                           |               |               |
| 1                                                                                                    | 0x4000                                    | 90                          |               |               |
| 2                                                                                                    | 0XEAAB                                    | 330                         |               |               |
| 3                                                                                                    | 0x1555                                    | 30                          |               |               |
| 4                                                                                                    | 0x9555                                    | 210                         |               |               |
| 5                                                                                                    | 0x6AAB                                    | 150                         |               |               |
| 6                                                                                                    | 0xC000                                    | 290                         |               |               |
| 7                                                                                                    | 0x000                                     | 0                           |               |               |

| 2072.0Bh                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Incremental Encoder #2 - Low Speed Estimator Gain |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                      | $0 - [2^{(32)} - 1]$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the $K_v J$ value used by the Low Speed Estimator when the encoder is used as a velocity feedback source.<br>This value can be calculated from the ACE value as follows:<br>$(\text{Low Speed Smoothing}) \times (50/3) \times (\text{Encoder\_Cts/Rev}) \times (C_{pk}) \times (65536/(V_{vel}^2))$ , where:<br>$V_{vel} = (\text{Switching Frequency}/2)$<br>$C_{pk} = \text{Hardware Peak Current}$ |                                                   |       |               |               |

| 2072.0Ch                                                                                                                                                                                                                                                 | Incremental Encoder #2 - NTAD Selection Enum |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|----------------------------------------|--|-------------|-------|----------------|---|-------------|---|---------------|---|
| Data Type                                                                                                                                                                                                                                                | Data Range                                   | Units | Accessibility | Stored to NVM |                                        |  |             |       |                |   |             |   |               |   |
| N/A                                                                                                                                                                                                                                                      | 0-2                                          | N/A   | Read / Write  | Yes           |                                        |  |             |       |                |   |             |   |               |   |
| <b>Description:</b><br>Selects from one of the three Null Torque Angle Determination methods.                                                                                                                                                            |                                              |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| <table><tr><th colspan="2">Null Torque Angle Determination Method</th></tr><tr><th>Description</th><th>Value</th></tr><tr><td>Wake and Shake</td><td>0</td></tr><tr><td>Slam and Go</td><td>1</td></tr><tr><td>Sweep the Leg</td><td>2</td></tr></table> |                                              |       |               |               | Null Torque Angle Determination Method |  | Description | Value | Wake and Shake | 0 | Slam and Go | 1 | Sweep the Leg | 2 |
| Null Torque Angle Determination Method                                                                                                                                                                                                                   |                                              |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Description                                                                                                                                                                                                                                              | Value                                        |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Wake and Shake                                                                                                                                                                                                                                           | 0                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Slam and Go                                                                                                                                                                                                                                              | 1                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |
| Sweep the Leg                                                                                                                                                                                                                                            | 2                                            |       |               |               |                                        |  |             |       |                |   |             |   |               |   |

| 2072.0Dh                                                                                                                                                                           | Incremental Encoder #2 - Maximum Amount of NTAD Movement Allowed |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                         | 0 – $2^{16}-1$                                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the amount of movement allowed (per unit length) during the execution of certain Null Torque Angle Determination methods. |                                                                  |       |               |               |

| 2072.0Eh                                                                                                                                                                                                                                      | Incremental Encoder #2 - Maximum Torque Current Allowed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                     | Data Range                                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                    | 0 – $2^{16}-1$                                          | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the maximum amount of torque producing current to be used during any of the Null Torque Angle Determination methods. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                                         |       |               |               |

| 2072.0Fh                                                                                                                                                                                    | Incremental Encoder #2 - Lock Time |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{16}-1$                     | ms    | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of milliseconds to lock the rotor in a null torque position at the end of a successful Null Torque Angle Determination. |                                    |       |               |               |

| 2072.10h                                                                                                                                                                                              | Incremental Encoder #2 - Internal Retry Brake Time |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                             | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                            | 0 – $2^{16}-1$                                     | ms    | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of milliseconds to apply the dynamic brake to stop any motion between consecutive Null Torque Angle Determination retry attempts. |                                                    |       |               |               |

| 2072.11h                                                                          | Incremental Encoder #2 - Motor Rated Current |       |               |               |
|-----------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                        | $2^{15}$ – $2^{15}-1$                        | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the rated motor current. |                                              |       |               |               |

| 2072.12h                                                                                                                                                                                 | Incremental Encoder #2 - NTAD Start Angle |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0 - 360                                   | DG1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the initial electrical angle used at the start of Phase Detect. This value can only be written when Phase Detect is not active. |                                           |       |               |               |

| 2072.13h                                                                                                                                                                                                                                                                           | Incremental Encoder #2 - Velocity Sense Configuration |                                                                                         |               |               |      |      |             |   |                     |                                                                                         |         |          |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------|---------------|------|------|-------------|---|---------------------|-----------------------------------------------------------------------------------------|---------|----------|-----------|
| Data Type                                                                                                                                                                                                                                                                          | Data Range                                            | Units                                                                                   | Accessibility | Stored to NVM |      |      |             |   |                     |                                                                                         |         |          |           |
| Structure                                                                                                                                                                                                                                                                          | N/A                                                   | N/A                                                                                     | Read / Write  | Yes           |      |      |             |   |                     |                                                                                         |         |          |           |
| <b>Description:</b><br>Contains a structure used to configure the velocity sense for Incremental Encoder #2                                                                                                                                                                        |                                                       |                                                                                         |               |               |      |      |             |   |                     |                                                                                         |         |          |           |
| <table><tr><th>Bits</th><th>Name</th><th>Description</th></tr><tr><td>0</td><td>Low Speed Estimator</td><td>0: The Low Speed Estimate is active (default)<br/>1: The Low Speed Estimator is inactive</td></tr><tr><td>1...152</td><td>Reserved</td><td>Must be 0</td></tr></table> |                                                       |                                                                                         |               |               | Bits | Name | Description | 0 | Low Speed Estimator | 0: The Low Speed Estimate is active (default)<br>1: The Low Speed Estimator is inactive | 1...152 | Reserved | Must be 0 |
| Bits                                                                                                                                                                                                                                                                               | Name                                                  | Description                                                                             |               |               |      |      |             |   |                     |                                                                                         |         |          |           |
| 0                                                                                                                                                                                                                                                                                  | Low Speed Estimator                                   | 0: The Low Speed Estimate is active (default)<br>1: The Low Speed Estimator is inactive |               |               |      |      |             |   |                     |                                                                                         |         |          |           |
| 1...152                                                                                                                                                                                                                                                                            | Reserved                                              | Must be 0                                                                               |               |               |      |      |             |   |                     |                                                                                         |         |          |           |

### 2073h: Incremental Encoder #2 Feedback Values

| 2073.01h                                                                                           | Incremental Encoder #2 - Encoder Position |        |               |               |
|----------------------------------------------------------------------------------------------------|-------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                          | Data Range                                | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                          | $[-2^{(31)}] - [2^{(31)}-1]$              | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the position reported by the incremental encoder connected to FB2. |                                           |        |               |               |

| 2073.02h                                                                                                                                                                | Incremental Encoder #2 - Position Index Capture Value |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                            | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                               | $[-2^{(31)}] - [2^{(31)}-1]$                          | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the position of the last encoder index captured by the drive for the incremental encoder connected to FB2. Requires encoder with index. |                                                       |        |               |               |

### 2074h: Absolute Serial Encoder Motor Feedback

| 2074.01h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2074.02h                                                                                                  | Absolute Serial Encoder - Commutation Counts per Unit Length |        |               |               |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                 | Data Range                                                   | Units  | Accessibility | Stored to NVM |
| Unsigned32                                                                                                | 0 – $2^{(32)}-1$                                             | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of quadrature counts per unit length. |                                                              |        |               |               |

| 2074.03h                                                                                           | Absolute Serial Encoder - Pole Pairs per Unit Length |        |               |               |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                          | Data Range                                           | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 1-64                                                 | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of pole pairs per unit length. |                                                      |        |               |               |

| 2074.04h                                                                                            | Absolute Serial Encoder - Motor Phase Resistance |       |               |               |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                           | Data Range                                       | Units | Accessibility | Stored to NVM |
| Integer16                                                                                           | 0 – $2^{(16)}-1$                                 | ohms  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the resistance of each phase of the motor. |                                                  |       |               |               |

| 2074.05h                                                                                            | Absolute Serial Encoder - Motor Phase Inductance |        |               |               |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                           | Data Range                                       | Units  | Accessibility | Stored to NVM |
| Integer16                                                                                           | 0 – $2^{(16)}-1$                                 | Henrys | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the inductance of each phase of the motor. |                                                  |        |               |               |

| 2074.06h                                                                                                                                           | Absolute Serial Encoder - Null Torque Angle at Encoder Zero Position |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                          | Data Range                                                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                         | 0 – $2^{(16)}-1$                                                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the null torque angle of the motor when the position of the absolute encoder is 0 counts. |                                                                      |       |               |               |

| 2074.07h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2074.08h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2074.09h                                                                                                                                                                                                                                                                                                              | Absolute Serial Encoder - Monitored Encoder Parameters |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |
| Integer64                                                                                                                                                                                                                                                                                                             | 0 – $2^{(32)}-1$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>This is a structure containing both the offset and range of the monitored encoder. The offset is added to the absolute position value that is read from the encoder. The range restricts the values the encoder may take. Together it allows the user to specify the absolute reference frame. |                                                        |       |               |               |

| 2074.0Ah                                                                          | Absolute Serial Encoder - Motor Rated Current |        |               |               |
|-----------------------------------------------------------------------------------|-----------------------------------------------|--------|---------------|---------------|
| Data Type                                                                         | Data Range                                    | Units  | Accessibility | Stored to NVM |
| Integer16                                                                         | $2^{(15)}$ – $2^{(15)}-1$                     | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the rated motor current. |                                               |        |               |               |

## 2075h: Absolute Encoder #1 Feedback Values

| 2075.01h                                                                                            | Incremental Encoder #2 - Raw Encoder Position |        |               |               |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                           | Data Range                                    | Units  | Accessibility | Stored to NVM |
| Unsigned                                                                                            | 0 – $2^{(31)}-1$                              | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the raw position reported by the absolute encoder connected to FB1. |                                               |        |               |               |

| 2075.02h                                                                                | Absolute Encoder #1 - Monitored Encoder Position |        |               |               |
|-----------------------------------------------------------------------------------------|--------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                               | Data Range                                       | Units  | Accessibility | Stored to NVM |
| Integer32                                                                               | $2^{(31)}$ – $2^{(31)}-1$                        | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the measured position from the drive's reference frame. |                                                  |        |               |               |

| 2075.03h                                                                                                                         | Absolute Encoder #1 - Position Index Capture Value |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                                         | Units  | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                       | 0– $2^{(31)}$ – $2^{(31)}-1$                       | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the raw position reported by the absolute encoder connected to FB1 when the last index was seen. |                                                    |        |               |               |

| 2075.04h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

### 2046h: Auxiliary Input Parameters

| 2046.01h                                                                                                                                                                                  | Auxiliary Input - Input Counts: Config 0 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | $1 - [2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of input counts in the input/output ratio used for Encoder following and Step and Direction modes in Configuration 0. |                                          |       |               |               |

| 2046.02h                                                                                                                                                                                                                                                                                                                                                                                   | Auxiliary Input - Output Counts: Config 0 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                                                                                                  | $-[2^{(16)} - 1] - [2^{(16)} - 1]$        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the output in the input/output ratio used for Encoder following and Step and Direction modes in Configuration 0. Encoder following mode can be used only when the position loop is closed. However, Step and Direction can be used to control position, velocity or current. Therefore, the scaling value used is mode dependent. |                                           |       |               |               |

| 2046.03h                                                                                                                                                                                  | Auxiliary Input - Input Counts: Config 1 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | $1 - [2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the number of input counts in the input/output ratio used for Encoder following and Step and Direction modes in Configuration 1. |                                          |       |               |               |

| 2046.04h                                                                                                                                                                                                                                                                                                                                                                                   | Auxiliary Input - Output Counts: Config 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                                                                                                  | $-[2^{(16)} - 1] - [2^{(16)} - 1]$        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the output in the input/output ratio used for Encoder following and Step and Direction modes in Configuration 1. Encoder following mode can be used only when the position loop is closed. However, Step and Direction can be used to control position, velocity or current. Therefore, the scaling value used is mode dependent. |                                           |       |               |               |



**2035h: Current Loop Control Parameters**

| 2035.01h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read / Write  | Yes           |

| 2035.02h                                                                                                                                             | Drive Current Limits     |       |               |               |      |      |   |                    |   |                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|------|------|---|--------------------|---|--------------------------|
| Data Type                                                                                                                                            | Data Range               | Units | Accessibility | Stored to NVM |      |      |   |                    |   |                          |
| Structure                                                                                                                                            | N/A                      | DC1   | Read / Write  | Yes           |      |      |   |                    |   |                          |
| Description:<br>Contains a structure that contains the peak and continuous current limits set in the drive.                                          |                          |       |               |               |      |      |   |                    |   |                          |
| <table><tr><th>Word</th><th>Name</th></tr><tr><td>0</td><td>Peak Current Limit</td></tr><tr><td>1</td><td>Continuous Current Limit</td></tr></table> |                          |       |               |               | Word | Name | 0 | Peak Current Limit | 1 | Continuous Current Limit |
| Word                                                                                                                                                 | Name                     |       |               |               |      |      |   |                    |   |                          |
| 0                                                                                                                                                    | Peak Current Limit       |       |               |               |      |      |   |                    |   |                          |
| 1                                                                                                                                                    | Continuous Current Limit |       |               |               |      |      |   |                    |   |                          |

| 2035.03h                                                                                  | Peak Current Hold Time |                   |               |               |
|-------------------------------------------------------------------------------------------|------------------------|-------------------|---------------|---------------|
| Data Type                                                                                 | Data Range             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                | $0 - [2^{(16)} - 1]$   | milliseconds (ms) | Read / Write  | Yes           |
| Description:<br>Contains a value corresponding to the peak current time set in the drive. |                        |                   |               |               |

| 2035.04h                                                                                                           | Peak to Continuous Current Transition Time |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                          | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                         | $0 - [2^{(16)} - 1]$                       | milliseconds (ms) | Read / Write  | Yes           |
| Description:<br>Contains a value corresponding to the peak to continuous current transition time set in the drive. |                                            |                   |               |               |

| 2035.05h                                                                                                                                                                                      | Torque At Command Window |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | $0 - [2^{(16)} - 1]$     | DC1   | Read / Write  | Yes           |
| Description:<br>Contains a value for an At Command window around the current error. While in current mode, when the current error is within this window, the At Command event will be active. |                          |       |               |               |

| 2035.06h                                                                                                                                                                               | Torque At Command Time |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | $0 - [2^{(16)} - 1]$   | Milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the time the current error must be within the configured Torque At Command Window before the At Command event becomes active. |                        |                   |               |               |

| 2035.07h                                                                                   | Torque Current Target Offset  |       |               |               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer16                                                                                  | $[2^{(15)}] - [2^{(15)} - 1]$ | DC1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the torque current target offset. |                               |       |               |               |

| 2035.08h                                                                            | Phase Offset               |       |               |               |
|-------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                           | Data Range                 | Units | Accessibility | Stored to NVM |
| Integer16                                                                           | $[-2^{(14)}] - [2^{(14)}]$ | DG1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Phase Advance feature. |                            |       |               |               |

| 2035.09h                                                                                                                    | Application Current Limit - Config 0 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                   | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                  | $0 - [2^{(16)}]$                     | DC1   | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to the maximum allowable torque producing current target for Config 0 |                                      |       |               |               |

| 2035.0Ah                                                                                                                    | Application Current Limit - Config 1 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                   | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                  | $0 - [2^{(16)}]$                     | DC1   | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to the maximum allowable torque producing current target for Config 1 |                                      |       |               |               |

| 2035.0Bh                                                                                                                                                                                                                                                                                                                                                                                                              | User Current Slew Rate |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                    | N/A   | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to the maximum rate the current output is allied to change per servo period. A value of 0 indicates that the slew rate limiting is disabled. This can be calculated in units of A/us from the following formula:<br>$(\text{User Current Slew Rate}) \times (\text{Cpk}/2^{(14)})/\text{Tsp}, \text{ where:}$ Cpk = Hardware Peak Current<br>Tsp = Servo Period |                        |       |               |               |

### 2231h: Current Loop Gain Parameters

| 2231.02h                                                                                                                                                                                                                                                                                                             | Current Loop Gain (Set 0) |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                            | Data Range                | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                            | $0 - [2^{(15)}-1]$        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the proportional gain of the current loop for Gain Set 0. This value is calculated from the ACE gain value [%Vbus/A] as follows:<br>$(\text{Current Loop Gain}) \times 2^9 \times \text{C}_{pk}, \text{ where:}$ C <sub>pk</sub> = Hardware Peak Current |                           |       |               |               |

| 2231.03h                                                                                                                                                                                                                                                                                                                        | Current Loop Ki Cutoff (Set 0) |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                       | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                      | $0 - [2^{(15)}-1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Ki cutoff of the current loop for Gain Set 0. This value is calculated from the ACE gain value [Hz] as follows:<br>$(\text{Current Loop Cutoff}) \times (2^{16} \times 2 \times \pi) / (\text{V}_{cur}), \text{ where:}$ V <sub>cur</sub> = Switching Frequency |                                |       |               |               |

| 2231.04h                                                                                                                                                                                                                                                                                                             | Current Loop Gain (Set 1) |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                            | Data Range                | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                            | $0 - [2^{(15)}-1]$        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the proportional gain of the current loop for Gain Set 1. This value is calculated from the ACE gain value [%Vbus/A] as follows:<br>$(\text{Current Loop Gain}) \times 2^9 \times \text{C}_{pk}, \text{ where:}$ C <sub>pk</sub> = Hardware Peak Current |                           |       |               |               |

| 2231.05h                                                                                                                                                                                                                                                                                                                    | Current Loop Ki Cutoff (Set 1) |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                   | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                  | 0 – $2^{15}-1$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Ki cutoff of the current loop for Gain Set 1. This value is calculated from the ACE gain value [Hz] as follows:<br>$(\text{Current Loop Cutoff}) \times (2^{16} \times 2 \times \pi) / (V_{\text{cur}})$ , where:<br>$V_{\text{cur}}$ = Switching Frequency |                                |       |               |               |

| 2231.06h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2231.07h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2231.08h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2231.09h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2231.0Ah  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2231.0Bh  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

## 2235h: Velocity Loop Gain Parameters

| 2235.01h                                                                                                                                                                                                                                                                                                                                                                                                                 | Velocity Loop Proportional Gain: Gain Set 0 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                | Data Range                                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – $2^{(31)}-1$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the proportional loop gain of the velocity loop for Gain Set 0. This value can be calculated from the ACE gain value [A/(ct/s)] as follows:<br><br>$(\text{Velocity Loop Gain}) \times ((2^{16} \times V_{\text{vel}}) / (C_{\text{pk}}))$ , where:<br>$V_{\text{vel}} = (\text{Switching Frequency} / 2)$<br>$C_{\text{pk}} = \text{Hardware Peak Current}$ |                                             |       |               |               |

| 2235.02h                                                                                                                                                                                                                                                                                                                                          | Velocity Loop Ki Cutoff: Gain Set 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                         | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                         | 0 – $2^{(31)}-1$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Ki cutoff of the velocity loop for Gain Set 0. This value can be calculated from the ACE gain value [Hz] as follows:<br><br>$(\text{Velocity Loop Cutoff}) \times (2^{32} \times 2 \times \pi) / (V_{\text{vel}})$ , where<br>$V_{\text{vel}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2235.03h                                                                                                                                                                                                                                                                                                                                           | Velocity Loop Kd Cutoff: Gain Set 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                          | 0 – $2^{(31)}-1$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Kd dampening of the velocity loop for Gain Set 0. This value can be calculated from the ACE gain value as follows:<br><br>$(\text{Velocity Loop Dampening}) \times (2^{16} \times 2 \times \pi) / (V_{\text{vel}})$ , where<br>$V_{\text{vel}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2235.04h                                                                                                                                                                                                                                                                                                                                                                                                                  | Velocity Loop Acceleration Feed Forward Gain: Gain Set 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – $[2^{(31)}-1]$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the velocity loop acceleration feed forward gain for Gain Set 0. This value can be calculated from the ACE gain value $[A/(ct/s^2)]$ as follows:<br><br>$(\text{Velocity Loop Acceleration Feed Forward Gain}) \times ((2^{16} * (V_{vel})^2) / (C_{pk}))$ , where<br>$V_{vel} = (\text{Switching Frequency} / 2)$<br>$C_{pk} = \text{Hardware Peak Current}$ |                                                          |       |               |               |

| 2235.05h                                                                                                                                                                                                                                                                                                                                                                                  | Velocity Loop Proportional Gain: Gain Set 1 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                 | 0 – $[2^{(31)}-1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the proportional loop gain of the velocity loop for Gain Set 1. This value can be calculated from the ACE gain value $[A/(ct/s)]$ as follows:<br><br>$(\text{Velocity Loop Gain}) \times ((2^{16} * V_{vel}) / (C_{pk}))$ , where:<br>$V_{vel} = (\text{Switching Frequency} / 2)$<br>$C_{pk} = \text{Hardware Peak Current}$ |                                             |       |               |               |

| 2235.06h                                                                                                                                                                                                                                                                                                                    | Velocity Loop Ki Cutoff: Gain Set 1 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                   | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                   | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Ki cutoff of the velocity loop for Gain Set 1. This value can be calculated from the ACE gain value $[Hz]$ as follows:<br><br>$(\text{Velocity Loop Cutoff}) \times (2^{32} * 2 * \pi) / (V_{vel})$ , where<br>$V_{vel} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2235.07h                                                                                                                                                                                                                                                                                                                                           | Velocity Loop Kd Cutoff: Gain Set 1 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                          | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the Kd dampening of the velocity loop for Gain Set 1. This value can be calculated from the ACE gain value as follows:<br><br>$(\text{Velocity Loop Dampening}) \times (2^{16} \times 2 \times \pi) / (V_{\text{vel}})$ , where<br>$V_{\text{vel}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2235.08h                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Velocity Loop Acceleration Feed Forward Gain: Gain Set 1 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Data Range                                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0 – $[2^{(31)}-1]$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the velocity loop acceleration feed forward gain for Gain Set 1. This value can be calculated from the ACE gain value $[A(\text{ct/s}^2)]$ as follows:<br><br>$(\text{Velocity Loop Acceleration Feed Forward Gain}) \times ((2^{16} \times (V_{\text{vel}})^2) / (C_{\text{pk}}))$ , where<br>$V_{\text{vel}} = (\text{Switching Frequency} / 2)$<br>$C_{\text{pk}} = \text{Hardware Peak Current}$ |                                                          |       |               |               |

## 2236h: Velocity Indications and Limits

| 2236.01h                                                                                 | Velocity Loop Configuration Control |                             |                                             |               |
|------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------|---------------------------------------------|---------------|
| Data Type                                                                                | Data Range                          | Units                       | Accessibility                               | Stored to NVM |
| Integer16                                                                                | N/A                                 | N/A                         | Read / Write                                | Yes           |
| <b>Description:</b><br>Specifies feedback direction configuration for the velocity loop. |                                     |                             |                                             |               |
|                                                                                          | <b>Bits</b>                         | <b>Name</b>                 | <b>Description</b>                          |               |
|                                                                                          | 0                                   | Config 0 Feedback Direction | Valid Values:<br>0: Inverted<br>1: Standard |               |
|                                                                                          | 1                                   | Config 1 Feedback Direction | Valid Values<br>0: Inverted<br>1: Standard  |               |
|                                                                                          | [15:2]                              | Reserved                    | Reserved                                    |               |

| 2236.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Feedback Filter Coefficient |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Data Range                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – $2^{(31)}$              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the velocity feedback filter coefficient. To convert between the value entered into ACE and the value sent to the drive, use the following functions:<br><br>ACE to drive:<br>$2^{30}(-e^a + 1) = P$ where a = [value entered into ACE] x (-6.283185307x10 <sup>-4</sup> ) and P = [value sent to drive]<br><br>Drive to ACE:<br>$\frac{\ln\left(1 - \frac{P}{2^{30}}\right)}{-6.283185307 \times 10^{-4}} = \text{[value seen in ACE (Hz)]}$ where P = [value in drive] |                             |       |               |               |

| 2236.03h                                                                                                                                                                                                                                                     | Velocity Loop Integrator Decay Rate |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                    | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                    | 0 – $2^{(31)} - 1$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to a percentage of the velocity loop integrator decay rate. The value can be calculated from the velocity loop integrator decay rate as follows:<br><br>(% of Integrator Gain) * ( $2^{16}$ / 100 ) |                                     |       |               |               |

| 2236.04h                                                                                                                                                                                                                           | Motor Over Speed Limit |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                          | Data Range             | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                          | 0 – $2^{(28)}$         | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the motor over speed limit set in the drive. When the velocity of the motor meets or exceeds this value, the drive will indicate a motor over speed condition is present. |                        |       |               |               |

| 2236.05h                                                                                                                                                                                                                 | Velocity Loop Following Error Window |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                               | 0 – $2^{(28)}$                       | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the velocity at speed limit set in the drive. If the measured velocity meets or exceeds this value, the drive will perceive this as a velocity following error. |                                      |       |               |               |



| 2236.06h                                                                                                                                                                                                                 | Positive Target Velocity Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                               | 0 – $2^{28}$                   | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the positive velocity limit set in the drive. When the speed set by this value is met or exceeded, the drive will indicate that the positive limit was reached. |                                |       |               |               |

| 2236.07h                                                                                                                                                                                                                 | Negative Target Velocity Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                               | 0 – $2^{28}$                   | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the negative velocity limit set in the drive. When the speed set by this value is met or exceeded, the drive will indicate that the positive limit was reached. |                                |       |               |               |

| 2236.08h                                                                                                                                                                                                                 | Velocity Loop Integrator Decay Active Window |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                               | 0 – $2^{28}$                                 | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the velocity at speed limit set in the drive. If the measured velocity meets or exceeds this value, the drive will perceive this as a velocity following error. |                                              |       |               |               |

## 2238h: Position Loop Control Parameters

| 2238.01h                                                                                                                                                                                                                                                                                                                              | Position Loop Proportional Gain: Gain Set 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                             | Data Range                                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                             | 0 – $2^{31}-1$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop proportional gain for Gain Set 0. This value can be calculated from the ACE gain value [(ct/s)/ct] using the following formula:<br><br>(Position Loop Proportional Gain) $\times (2^{32} / V_{pos})$ where<br>$V_{pos} = (\text{Switching Frequency} / 2)$ |                                             |       |               |               |

| 2238.02h                                                                                                                                                                                                                                                                                                                                                            | Position Loop Ki Cutoff: Gain Set 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                           | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                           | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Ki cutoff of the position loop for Gain Set 0. This value can be calculated from the ACE gain value [Hz] using the following formula:<br><br>$(\text{Position Loop Cutoff}) \times [(2^{32} \times 2 \times \pi) / (V_{\text{pos}}^2)]$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2238.03h                                                                                                                                                                                                                                                                                                                                                                  | Position Loop Kd Cutoff: Gain Set 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                 | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                 | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Kd dampening of the position loop for Gain Set 0. This value can be calculated from the ACE gain value [Hz] using the following formula:<br><br>$(\text{Position Loop Dampening}) \times [(2^{32} \times 2 \times \pi) / (V_{\text{pos}}^2)]$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2238.04h                                                                                                                                                                                                                                                                                         | Position Loop Velocity Feed Forward Gain: Gain Set 0 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                        | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                        | 0 – $[2^{(31)}-1]$                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop velocity feed forward gain for Gain Set 0. This value can be calculated from the ACE gain value [(ct/s)/(ct/s)] using the following formula:<br><br>$(\text{Position Loop Velocity Feed Forward Gain}) \times 2^{28}$ |                                                      |       |               |               |

| 2238.05h                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Position Loop Acceleration Feed Forward Gain: Gain Set 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Data Range                                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – $[2^{(31)}-1]$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop acceleration feed forward gain for Gain Set 0. This value can be calculated from the ACE gain value $[A/(ct/s^2)]$ using the following formula:<br><br>$(\text{Position Loop Acceleration Feed Forward Gain}) \times ((2^{28} \times V_{\text{pos}}^2) / C_{\text{pk}})$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$<br>$C_{\text{pk}} = \text{Hardware Peak Current}$ |                                                          |       |               |               |

| 2238.06h                                                                                  | Position Loop Configuration Control |                                            |               |               |
|-------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------|---------------|---------------|
| Data Type                                                                                 | Data Range                          | Units                                      | Accessibility | Stored to NVM |
| Integer16                                                                                 | N/A                                 | N/A                                        | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies feedback direction configuration for the position loop.. |                                     |                                            |               |               |
| Bit                                                                                       | Name                                | Description                                |               |               |
| 0                                                                                         | Config 0 Feedback Direction         | Valid Values<br>0: Inverted<br>1: Standard |               |               |
| 1                                                                                         | Config 1 Feedback Direction         | Valid Values<br>0: Inverted<br>1: Standard |               |               |
| [15:2]                                                                                    | Reserved                            | Reserved                                   |               |               |

| 2238.07h                                                                                                                                                                                                                                                             | Position Loop Integrator Decay Rate |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                            | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                            | 0 – $2^{31}-1$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to a percentage of the position loop integrator decay rate. The value can be calculated from the position loop integrator decay rate as follows:<br>$(\% \text{ of Integrator Gain}) \times (2^{16} / 100)$ |                                     |       |               |               |

| 2238.08h                                                                                                                                                                                                                                                                                                                                       | Position Loop Proportional Gain: Gain Set 1 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                      | Data Range                                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                      | 0 – $2^{31}-1$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop proportional gain for Gain Set 1. This value can be calculated from the ACE gain value $[(ct/s)/ct]$ using the following formula:<br><br>$(\text{Position Loop Proportional Gain}) \times (2^{32} / V_{pos})$ where<br>$V_{pos} = (\text{Switching Frequency} / 2)$ |                                             |       |               |               |

| 2238.09h                                                                                                                                                                                                                                                                                                                                                            | Position Loop Ki Cutoff: Gain Set 1 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                           | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                           | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Ki cutoff of the position loop for Gain Set 1. This value can be calculated from the ACE gain value [Hz] using the following formula:<br><br>$(\text{Position Loop Cutoff}) \times [(2^{32} \times 2 \times \pi) / (V_{\text{pos}}^2)]$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2238.0Ah                                                                                                                                                                                                                                                                                                                                                                  | Position Loop Kd Cutoff: Gain Set 1 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                 | Data Range                          | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                 | 0 – $[2^{(31)}-1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the Kd dampening of the position loop for Gain Set 1. This value can be calculated from the ACE gain value [Hz] using the following formula:<br><br>$(\text{Position Loop Dampening}) \times [(2^{32} \times 2 \times \pi) / (V_{\text{pos}}^2)]$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$ |                                     |       |               |               |

| 2238.0Bh                                                                                                                                                                                                                                                                                         | Position Loop Velocity Feed Forward Gain: Gain Set 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                        | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                        | 0 – $[2^{(31)}-1]$                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop velocity feed forward gain for Gain Set 1. This value can be calculated from the ACE gain value [(ct/s)/(ct/s)] using the following formula:<br><br>$(\text{Position Loop Velocity Feed Forward Gain}) \times 2^{28}$ |                                                      |       |               |               |

| 2238.0Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Position Loop Acceleration Feed Forward Gain: Gain Set 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Data Range                                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – $[2^{(31)}-1]$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the position loop acceleration feed forward gain for Gain Set 1. This value can be calculated from the ACE gain value [A/(ct/s^2)] using the following formula:<br><br>$(\text{Position Loop Acceleration Feed Forward Gain}) \times ((2^{28} \times V_{\text{pos}}^2) / \text{Cpk})$ , where<br>$V_{\text{pos}} = (\text{Switching Frequency} / 2)$<br>$\text{Cpk} = \text{Hardware Peak Current}$ |                                                          |       |               |               |

**2039h: Position Limits**

| 2039.01h                                                                                                                                                                                     | Preset Position                |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                    | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Replacement value for the measured position when the Set Position event is triggered. This allows you to redefine the current measured position (e.g. reset to zero). |                                |        |               |               |

| 2039.02h                                                                                                                                                                    | Measured Position Limit        |        |               |               |      |             |     |                             |     |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|------|-------------|-----|-----------------------------|-----|-----------------------------|
| Data Type                                                                                                                                                                   | Data Range                     | Units  | Accessibility | Stored to NVM |      |             |     |                             |     |                             |
| Structure                                                                                                                                                                   | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read / Write  | Yes           |      |             |     |                             |     |                             |
| <b>Description:</b><br>Four-word structure containing the minimum and maximum measured position limits.                                                                     |                                |        |               |               |      |             |     |                             |     |                             |
| <table><tr><th>Word</th><th>Description</th></tr><tr><td>0-1</td><td>Max Measured Position Limit</td></tr><tr><td>2-3</td><td>Min Measured Position Limit</td></tr></table> |                                |        |               |               | Word | Description | 0-1 | Max Measured Position Limit | 2-3 | Min Measured Position Limit |
| Word                                                                                                                                                                        | Description                    |        |               |               |      |             |     |                             |     |                             |
| 0-1                                                                                                                                                                         | Max Measured Position Limit    |        |               |               |      |             |     |                             |     |                             |
| 2-3                                                                                                                                                                         | Min Measured Position Limit    |        |               |               |      |             |     |                             |     |                             |

| 2039.03h                                                                                                                                                              | At Home Position Window        |        |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Defines a window around the Home Position Value, such that when the measured position is within this window, the At-Home event will be active. |                                |        |               |               |

| 2039.04h                                                                                                                                                          | In Position Window   |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range           | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                         | $0 - [2^{(32)} - 1]$ | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Defines a window around the target position, such that when the position error is within this window, the At Command event will be active. |                      |        |               |               |

| 2039.05h                                                                                                                                                                                                                                                                                                   | Position Following Error Window |        |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                  | Data Range                      | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                  | $0 - [2^{(32)} - 1]$            | counts | Read / Write  | Yes           |
| <b>Description:</b><br>The maximum allowed position error (difference between target position and measured position), prior to setting the "Position Following Error" event (active in position mode only). This parameter is equivalent to the "Position Following Error Limit" of DSP402 (object 6065h). |                                 |        |               |               |

| 2039.06h                                                                                              | Target Position Limit          |                           |               |               |
|-------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------|---------------|---------------|
| Data Type                                                                                             | Data Range                     | Units                     | Accessibility | Stored to NVM |
| Structure                                                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts                    | Read / Write  | Yes           |
| <b>Description:</b><br>Four-word structure containing the minimum and maximum target position limits. |                                |                           |               |               |
| <b>Word</b>                                                                                           |                                | <b>Description</b>        |               |               |
| 0-1                                                                                                   |                                | Max Target Position Limit |               |               |
| 2-3                                                                                                   |                                | Min Target Position Limit |               |               |

| 2039.07h                                                                                                                                                                                                                                                                                        | Position Limits Control  |                       |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|---------------|---------------|-----|------|-------------|---|--------------------------|-----------------------|---|------------------------|-----------------------|------|----------|----------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range               | Units                 | Accessibility | Stored to NVM |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| Unsigned16                                                                                                                                                                                                                                                                                      | N/A                      | N/A                   | Read / Write  | Yes           |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| <b>Description:</b><br>Contains a value configuring the operation of the position limits.                                                                                                                                                                                                       |                          |                       |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| <table><tr><th>Bit</th><th>Name</th><th>Description</th></tr><tr><td>0</td><td>Measured Position Limits</td><td>0=Disabled; 1=Enabled</td></tr><tr><td>1</td><td>Target Position Limits</td><td>0=Disabled; 1=Enabled</td></tr><tr><td>2-15</td><td>Reserved</td><td>Reserved</td></tr></table> |                          |                       |               |               | Bit | Name | Description | 0 | Measured Position Limits | 0=Disabled; 1=Enabled | 1 | Target Position Limits | 0=Disabled; 1=Enabled | 2-15 | Reserved | Reserved |
| Bit                                                                                                                                                                                                                                                                                             | Name                     | Description           |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| 0                                                                                                                                                                                                                                                                                               | Measured Position Limits | 0=Disabled; 1=Enabled |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| 1                                                                                                                                                                                                                                                                                               | Target Position Limits   | 0=Disabled; 1=Enabled |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |
| 2-15                                                                                                                                                                                                                                                                                            | Reserved                 | Reserved              |               |               |     |      |             |   |                          |                       |   |                        |                       |      |          |          |

| 2039.08h                                                                                                                                                                                       | Position Integrator Decay Active Window |        |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                              | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                      | $[-2^{(31)}] - [2^{(31)} - 1]$          | counts | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value that corresponds to the position loop integrator decay active window. The decay will be active when the position error value falls within this window. |                                         |        |               |               |

### 6065h: Position Following Error Window

| 6065h                                                                                                                                                                                              | Position Following Error Window |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                          | Data Range                      | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                          | $0 - [2^{(32)} - 1]$            | counts | Read / Write  | Yes           |
| <b>Description:</b><br>The maximum allowed position error (difference between target and measured position), prior to setting the "Position Following Error" event (active in position mode only). |                                 |        |               |               |

**60F4h: Position Following Error Actual Value**

| 60F4h                                                                                                                                             | Position Following Error Actual Value |        |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                         | Data Range                            | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                         | $[-2^{32}] - [2^{(32)} - 1]$          | counts | Read Only     | Yes           |
| <b>Description:</b><br>Provides the actual value of the position following error, defined as the difference between target and measured position. |                                       |        |               |               |

**6098h: Homing Method**

| 6098h                                                                                                                                                               | Homing Method |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range    | Units | Accessibility | Stored to NVM |
| Integer8                                                                                                                                                            | $[-2] - 35$   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>There are almost 35 homing methods supported by AMC servo drives. See <a href="#">"Homing" on page 40</a> for details on each homing method. |               |       |               |               |

**6099h: Homing Speeds**

| 6099.01h                                                                                                                                           | Speed During Search For Switch |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                          | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                         | $0 - (2^{32}-1)$               | DS4   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the speed during the first stage of Homing algorithms. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                |       |               |               |

| 6099.02h                                                                                                                                                                                                                         | Speed During Search For Zero |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                        | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                       | $0 - (2^{32}-1)$             | DS4   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the speed during the search for zero. This is usually after the search for switch has completed and is set much slower for accuracy. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

**609Ah: Homing Acceleration**

| 609Ah                                                                                                                                                                       | Homing Acceleration |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range          | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                  | $0 - (2^{32}-1)$    | DA1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the accelerations and decelerations used by the drive's homing routine. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                     |       |               |               |

**607Ch: Home Offset**

| 607Ch                                                                                                                                                                                                                                                                                                                                           | Home Offset            |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                       | Data Range             | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                       | $-2^{31} - (2^{31}-1)$ | counts | Read / Write  | Yes           |
| <b>Description:</b><br>When the homing routine is complete, the zero position found by the drive is given an offset equal to the value stored in this object. All moves are interpreted relative to this new zero position. When homing completes, the equation for the drive's current position is "Current position = 0 – Home Offset value". |                        |        |               |               |

**2048h: PVT Parameters**

| 2048.01h                                                                                                           | Buffer Threshold Warning Level |       |               |               |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                          | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                         | $0 - [2^{(16)} - 1]$           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>A buffer threshold warning will occur when this number of PVT points is left in the buffer. |                                |       |               |               |

| 2048.02h                                                                                                                                                                                                                                                                                                          | PVT Input Method                           |       |               |               |       |              |   |                                         |   |                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|-------|--------------|---|-----------------------------------------|---|--------------------------------------------|
| Data Type                                                                                                                                                                                                                                                                                                         | Data Range                                 | Units | Accessibility | Stored to NVM |       |              |   |                                         |   |                                            |
| Unsigned16                                                                                                                                                                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |       |              |   |                                         |   |                                            |
| <b>Description:</b><br>Defines if incremental or absolute position is to be used with PVT commands. Incremental position sets the PVT target position point equal to the previous PVT position point plus the specified value. Absolute position sets the PVT target position point equal to the specified value. |                                            |       |               |               |       |              |   |                                         |   |                                            |
| <table><tr><th>Value</th><th>Input Method</th></tr><tr><td>0</td><td>Absolute position with sequence counter</td></tr><tr><td>1</td><td>Incremental position with sequence counter</td></tr></table>                                                                                                              |                                            |       |               |               | Value | Input Method | 0 | Absolute position with sequence counter | 1 | Incremental position with sequence counter |
| Value                                                                                                                                                                                                                                                                                                             | Input Method                               |       |               |               |       |              |   |                                         |   |                                            |
| 0                                                                                                                                                                                                                                                                                                                 | Absolute position with sequence counter    |       |               |               |       |              |   |                                         |   |                                            |
| 1                                                                                                                                                                                                                                                                                                                 | Incremental position with sequence counter |       |               |               |       |              |   |                                         |   |                                            |

**6086h: Motion Profile Type**

| 6086.00h                                                                                                                                                                                                                                                                                                                    | Motion Profile Type               |       |               |               |       |              |             |                                   |   |                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|-------|--------------|-------------|-----------------------------------|---|------------------------------|
| Data Type                                                                                                                                                                                                                                                                                                                   | Data Range                        | Units | Accessibility | Stored to NVM |       |              |             |                                   |   |                              |
| Integer16                                                                                                                                                                                                                                                                                                                   | 0 - 2                             | N/A   | Read Only     | No            |       |              |             |                                   |   |                              |
| <b>Description:</b><br>Specifies the type of profile to be used for profiled position mode (see object 6060 for setting modes). The default profile type is linear (trapezoidal), but accel/decel may be selected. This value is not stored to NVM. Specific values for either profile can be configured using object 203C. |                                   |       |               |               |       |              |             |                                   |   |                              |
| <table><tr><th>Value</th><th>Input Method</th></tr><tr><td>0 (default)</td><td>Linear Ramp (trapezoidal profile)</td></tr><tr><td>2</td><td>Accel/Decel (jerk-free ramp)</td></tr></table>                                                                                                                                  |                                   |       |               |               | Value | Input Method | 0 (default) | Linear Ramp (trapezoidal profile) | 2 | Accel/Decel (jerk-free ramp) |
| Value                                                                                                                                                                                                                                                                                                                       | Input Method                      |       |               |               |       |              |             |                                   |   |                              |
| 0 (default)                                                                                                                                                                                                                                                                                                                 | Linear Ramp (trapezoidal profile) |       |               |               |       |              |             |                                   |   |                              |
| 2                                                                                                                                                                                                                                                                                                                           | Accel/Decel (jerk-free ramp)      |       |               |               |       |              |             |                                   |   |                              |



**6088h: Torque Profile Type**

| 6088.00h                                                                                                                                                                                                    | Torque Profile Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                   | Data Range          | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                   | 0                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>Specifies the type of profile to be used for profiled torque mode (see object 6060 for setting modes). The value is fixed equal to 0 which specifies a linear (trapezoidal) profile. |                     |       |               |               |

**203Ch: Command Limiter Parameters** The Command Limiter limits the slope of the target command in any mode. It is broken into four components, where each component is assigned to one sub-index. To remove any effects of the command limiter, maximize all limiter parameters. Some limiter parameters have units that change with the operating mode of the drive. For these parameters, refer to [Table 2.1](#) to make the correct unit selection.

**TABLE 2.1** Command Limiter Units

| Drive Operation Mode                  | Units |
|---------------------------------------|-------|
| Current (Torque)                      | DJ1   |
| Velocity                              | DA2   |
| Position (Around Velocity Or Current) | DS2   |

| 203C.01h                                                                                                                                                                                                                    | Linear Ramp Positive Target Positive Change: Config 0 |                               |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                   | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                  | 0 - $2^{(48)} - 1$                                    | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum positive change in positive command used with the command limiter in Configuration 0. Units are mode dependant. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.02h                                                                                                                                                                                                                    | Linear Ramp Positive Target Negative Change: Config 0 |                               |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                   | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                  | 0 - $2^{(48)} - 1$                                    | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum negative change in positive command used with the command limiter in Configuration 0. Units are mode dependant. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.03h                                                                                                                                                                                                                       | Linear Ramp Negative Target Negative Change: Config 0 |                               |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                      | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                     | 0 - $[2^{(48)} - 1]$                                  | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum negative change in negative command used with the command limiter in Configuration 0. Units are mode dependant.<br>See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.04h                                                                                                                                                                                                                       | Linear Ramp Negative Target Positive Change: Config 0 |                               |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                      | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                     | 0 - $[2^{(48)} - 1]$                                  | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum positive change in negative command used with the command limiter in Configuration 0. Units are mode dependant.<br>See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.05h                                                                                                                                                                                                                       | Linear Ramp Positive Target Positive Change: Config 1 |                               |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                      | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                     | 0 - $[2^{(48)} - 1]$                                  | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum positive change in positive command used with the command limiter in Configuration 1. Units are mode dependant.<br>See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.06h                                                                                                                                                                                                                       | Linear Ramp Positive Target Negative Change: Config 1 |                               |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                      | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                     | 0 - $[2^{(48)} - 1]$                                  | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum negative change in positive command used with the command limiter in Configuration 1. Units are mode dependant.<br>See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.07h                                                                                                                                                                                                                       | Linear Ramp Negative Target Negative Change: Config 1 |                               |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                      | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                     | 0 - $[2^{(48)} - 1]$                                  | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum negative change in negative command used with the command limiter in Configuration 1. Units are mode dependant.<br>See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.08h                                                                                                                                                                                                                    | Linear Ramp Negative Target Positive Change: Config 1 |                               |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                   | Data Range                                            | Units                         | Accessibility | Stored to NVM |
| Unsigned48                                                                                                                                                                                                                  | 0 - $2^{(48)} - 1$                                    | See <a href="#">Table 2.1</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum positive change in negative command used with the command limiter in Configuration 1. Units are mode dependant. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |                               |               |               |

| 203C.09h                                                                                                                                         | Controlled Accel/Decel Maximum Speed: Config 0 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                        | Data Range                                     | Units | Accessibility | Stored to NVM |
| Integer64                                                                                                                                        | 0 - $2^{(64)} - 1$                             | DS3   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the maximum speed for a profile in Configuration 0. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                |       |               |               |

| 203C.0Ah                                                                                                                                                                   | Controlled Accel/Decel Maximum Acceleration: Config 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                            | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                  | 0 - $2^{(32)} - 1$                                    | DA3   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum acceleration used with the command limiter in Configuration 0. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |       |               |               |

| 203C.0Bh                                                                                                                                                                   | Controlled Accel/Decel Maximum Deceleration: Config 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                            | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                  | 0 - $2^{(32)} - 1$                                    | DA3   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum deceleration used with the command limiter in Configuration 0. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |       |               |               |

| 203C.0Ch                                                                                                                                         | Controlled Accel/Decel Maximum Speed: Config 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                        | Data Range                                     | Units | Accessibility | Stored to NVM |
| Integer64                                                                                                                                        | 0 - $2^{(64)} - 1$                             | DS3   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the maximum speed for a profile in Configuration 1. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                |       |               |               |

| 203C.0Dh                                                                                                                                                                   | Controlled Accel/Decel Maximum Acceleration: Config 1 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                            | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                  | 0 - $2^{(32)} - 1$                                    | DA3   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum acceleration used with the command limiter in Configuration 1. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |       |               |               |

| 203C.0Eh                                                                                                                                                                   | Controlled Accel/Decel Maximum Deceleration: Config 1 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                            | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                  | 0 - $2^{(32)} - 1$                                    | DA3   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the maximum deceleration used with the command limiter in Configuration 1. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                                                       |       |               |               |

| 203C.0Fh  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 203C.10h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

## 2243h: Velocity Mode Jerk Limiting Configuration

| 2243.01h                                                                                                      | Jerk Limiting - Config 0 |              |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------|--------------|---------------|---------------|
| Data Type                                                                                                     | Data Range               | Units        | Accessibility | Stored to NVM |
| Unsigned16                                                                                                    | 0- $2^{(16)} - 1$        | milliseconds | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum jerk in Velocity Mode with Jerk Limiting active in Configuration 0 |                          |              |               |               |

| 2243.02h                                                                                                              | Maximum Acceleration Limit - Config 0 |                     |               |               |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|---------------|---------------|
| Data Type                                                                                                             | Data Range                            | Units               | Accessibility | Stored to NVM |
| Unsigned32                                                                                                            | 0- $2^{(32)} - 1$                     | ct/s <sup>(2)</sup> | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum acceleration in Velocity Mode with Jerk Limiting active in Configuration 0 |                                       |                     |               |               |

| 2243.03h                                                                                                              | Maximum Deceleration Limit - Config 0 |                     |               |               |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|---------------|---------------|
| Data Type                                                                                                             | Data Range                            | Units               | Accessibility | Stored to NVM |
| Unsigned32                                                                                                            | 0- $2^{(32)} - 1$                     | ct/s <sup>(2)</sup> | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum deceleration in Velocity Mode with Jerk Limiting active in Configuration 0 |                                       |                     |               |               |

| 2243.04h                                                                                                                     | Maximum Velocity Limit- Config 0 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                    | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                   | 0- $2^{(32)}-1$                  | ct/s  | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum speed for a profile in Velocity Mode with Jerk Limiting active in Configuration 0 |                                  |       |               |               |

| 2243.05h                                                                                                      | Jerk Limiting - Config 1 |             |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------|-------------|---------------|---------------|
| Data Type                                                                                                     | Data Range               | Units       | Accessibility | Stored to NVM |
| Unsigned16                                                                                                    | 0- $2^{(16)}-1$          | millisecond | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum jerk in Velocity Mode with Jerk Limiting active in Configuration 1 |                          |             |               |               |

| 2243.06h                                                                                                              | Maximum Acceleration Limit - Config 1 |                     |               |               |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|---------------|---------------|
| Data Type                                                                                                             | Data Range                            | Units               | Accessibility | Stored to NVM |
| Unsigned32                                                                                                            | 0- $2^{(32)}-1$                       | ct/s <sup>(2)</sup> | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum acceleration in Velocity Mode with Jerk Limiting active in Configuration 1 |                                       |                     |               |               |

| 2243.07h                                                                                                              | Maximum Deceleration Limit - Config 1 |                     |               |               |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|---------------|---------------|
| Data Type                                                                                                             | Data Range                            | Units               | Accessibility | Stored to NVM |
| Unsigned32                                                                                                            | 0- $2^{(32)}-1$                       | ct/s <sup>(2)</sup> | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum deceleration in Velocity Mode with Jerk Limiting active in Configuration 1 |                                       |                     |               |               |

| 2243.08h                                                                                                                     | Maximum Velocity Limit - Config 1 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                    | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                   | 0- $2^{(32)}-1$                   | ct/s  | Read/Write    | Yes           |
| <b>Description:</b><br>Defines the maximum speed for a profile in Velocity Mode with Jerk Limiting active in Configuration 1 |                                   |       |               |               |

**60C2h: Interpolation Time Period** This object is used only for synchronous cyclic modes of operation (see [“6060h: Modes Of Operation” on page 282](#)). The interpolation time period defines the rate in which target commands are sent by the host to the drive. When a periodic target command is sent to the drive at a rate slower than the loop update rate, there is potential for the loop gains to spike with each new target command. Defining the interpolation

time period allows the target to follow a linear ramp between target commands. The interpolation time period is made up of two values as follows:

Interpolation Time Period = [interpolation time period value] x  $10^{(\text{interpolation time index})}$  seconds

The drive will support an interpolation time period between 0 and 1 second. If the value is not a multiple of the loop update rate, it will be truncated to the next lowest multiple.

| 60C2.01h                                                                      | Interpolation Time Period Value |       |               |               |
|-------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                     | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned 8                                                                    | 0 - 255                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the mantissa of the interpolation time period. |                                 |       |               |               |

| 60C2.02h                                                                      | Interpolation Time Index |       |               |               |
|-------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                     | Data Range               | Units | Accessibility | Stored to NVM |
| Integer 8                                                                     | -6 to 0                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the exponent of the interpolation time period. |                          |       |               |               |

## 2.3.2 Hardware Profile

### 2008h: Drive Initialization Parameters

| 2008.01h                                                                                                                                                                                                                                                                                                                                                        | Start-Up Sequence Control                   |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|-----|---------------------------------|---|----------------|---|---------------|---|--------------|---|--------------|---|---------------------------------------------|--------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                       | Data Range                                  | Units | Accessibility | Stored to NVM |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                      | 0 – [2 <sup>(16)</sup> – 1]                 | N/A   | Read / Write  | Yes           |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| <b>Description:</b><br>Defines how the drive will behave when power is first applied.                                                                                                                                                                                                                                                                           |                                             |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| <table><tr><th>Bit</th><th>Drive Initialization Parameters</th></tr><tr><td>0</td><td>Disable Bridge</td></tr><tr><td>1</td><td>Load Config 1</td></tr><tr><td>2</td><td>Phase Detect</td></tr><tr><td>3</td><td>Set Position</td></tr><tr><td>4</td><td>Enable Motion Engine After Startup Sequence</td></tr><tr><td>5...15</td><td>Reserved</td></tr></table> |                                             |       |               |               | Bit | Drive Initialization Parameters | 0 | Disable Bridge | 1 | Load Config 1 | 2 | Phase Detect | 3 | Set Position | 4 | Enable Motion Engine After Startup Sequence | 5...15 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                             | Drive Initialization Parameters             |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 0                                                                                                                                                                                                                                                                                                                                                               | Disable Bridge                              |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 1                                                                                                                                                                                                                                                                                                                                                               | Load Config 1                               |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 2                                                                                                                                                                                                                                                                                                                                                               | Phase Detect                                |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 3                                                                                                                                                                                                                                                                                                                                                               | Set Position                                |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 4                                                                                                                                                                                                                                                                                                                                                               | Enable Motion Engine After Startup Sequence |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |
| 5...15                                                                                                                                                                                                                                                                                                                                                          | Reserved                                    |       |               |               |     |                                 |   |                |   |               |   |              |   |              |   |                                             |        |          |

| 2008.02h                                                                                                                                                                                                         | Start-Up Phase Detect Configuration                      |       |               |               |       |             |   |                                        |   |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------------|---------------|-------|-------------|---|----------------------------------------|---|----------------------------------------------------------|
| Data Type                                                                                                                                                                                                        | Data Range                                               | Units | Accessibility | Stored to NVM |       |             |   |                                        |   |                                                          |
| Unsigned16                                                                                                                                                                                                       | 0 – [2 <sup>(16)</sup> – 1]                              | N/A   | Read / Write  | Yes           |       |             |   |                                        |   |                                                          |
| <b>Description:</b><br>Defines how the Phase Detect feature will behave when power is first applied.                                                                                                             |                                                          |       |               |               |       |             |   |                                        |   |                                                          |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Phase Detect Immediately upon power-up</td></tr><tr><td>1</td><td>Phase Detect after the first bridge enable upon power-up</td></tr></table> |                                                          |       |               |               | Value | Description | 0 | Phase Detect Immediately upon power-up | 1 | Phase Detect after the first bridge enable upon power-up |
| Value                                                                                                                                                                                                            | Description                                              |       |               |               |       |             |   |                                        |   |                                                          |
| 0                                                                                                                                                                                                                | Phase Detect Immediately upon power-up                   |       |               |               |       |             |   |                                        |   |                                                          |
| 1                                                                                                                                                                                                                | Phase Detect after the first bridge enable upon power-up |       |               |               |       |             |   |                                        |   |                                                          |

| 2008.03h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2008.04h                                                                                                                                                                                                     | Hard Stop Detection                                                                                             |                                                                                             |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                    | Data Range                                                                                                      | Units                                                                                       | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                   | N/A                                                                                                             | N/A                                                                                         | Read / Write  | Yes           |
| <b>Description:</b><br>Allows the user to configure the various logic terms that will be inclusively OR'ed together in order to qualify a valid Hard Stop Event. Only applicable to Homing Methods -1 and -2 |                                                                                                                 |                                                                                             |               |               |
| Bit                                                                                                                                                                                                          | Name                                                                                                            | Description                                                                                 |               |               |
| [0]                                                                                                                                                                                                          | Zero Velocity Event is Active                                                                                   | If any of the selected Items become Active during Homing then a Hard Stop will be detected. |               |               |
| [1]                                                                                                                                                                                                          | Sustained Current Indicator is Active                                                                           |                                                                                             |               |               |
| [2]                                                                                                                                                                                                          | Position Following Error Event is Active                                                                        |                                                                                             |               |               |
| [3]                                                                                                                                                                                                          | Zero Velocity Event AND Sustained Current Indicator Event are both Active                                       |                                                                                             |               |               |
| [4]                                                                                                                                                                                                          | Zero Velocity Event AND Position Following Error Event Are both Active                                          |                                                                                             |               |               |
| [5]                                                                                                                                                                                                          | Sustained Current Indicator AND Position Following Error Event Are both Active                                  |                                                                                             |               |               |
| [6]                                                                                                                                                                                                          | Zero Velocity Event AND Sustained Current Indicator is Active AND Position Following Error Event Are ALL Active |                                                                                             |               |               |
| [15:7]                                                                                                                                                                                                       | Reserved                                                                                                        | Value Must be zero                                                                          |               |               |

## 20C8h: Motion Engine Configuration

| 20C8.01h                                                                                                                                                                       | Start-Up Motion Type |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                      | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                     | 0 – 1FFFh            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the startup behavior when running a motion engine index upon power-up. The bit values are broken up as defined below.                           |                      |       |               |               |
| <b>Bits 0:2</b><br>0: Indexer Mode<br>1-7: Reserved                                                                                                                            |                      |       |               |               |
| <b>Bits 3:4</b><br>0: Motion initiated via digital inputs<br>1: Motion initiated via Network commands                                                                          |                      |       |               |               |
| <b>Bits 5:8</b><br>Defines the index number to load on power-up                                                                                                                |                      |       |               |               |
| <b>Bits 9:15</b><br>0: Motion will not immediately start.<br>1: Motion will automatically start if the Motion Engine is configured to be enabled on power-up.<br>2-7: Reserved |                      |       |               |               |

## 2033h: User Voltage Protection Parameters

| 2033.01h                                                                                                                                                                                                                                                                                                                                                                                                                                        | Voltage Limits               |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                                                                                                                                                       | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the over voltage and under voltage limit specified for the drive. The over voltage limit must be set lower than the drive over-voltage hardware shutdown point and greater than the Nominal DC Bus Voltage. The under voltage limit must be set above the drive under-voltage hardware shutdown point and less than the Nominal DC Bus Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2033.02h                                                                                                                                                                                                                                         | Shunt Regulator Configuration      |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|-------|-------------|---|----------|---|----------------|---|----------------|---|------------------------------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                         | Units | Accessibility | Stored to NVM |       |             |   |          |   |                |   |                |   |                                    |
| Unsigned16                                                                                                                                                                                                                                       | See Table                          | N/A   | Read / Write  | Yes           |       |             |   |          |   |                |   |                |   |                                    |
| <b>Description:</b><br>Contains a value corresponding to the current state of the shunt regulator.                                                                                                                                               |                                    |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>No Shunt</td></tr><tr><td>1</td><td>Internal Shunt</td></tr><tr><td>2</td><td>External Shunt</td></tr><tr><td>3</td><td>Dual Shunt (Internal and External)</td></tr></table> |                                    |       |               |               | Value | Description | 0 | No Shunt | 1 | Internal Shunt | 2 | External Shunt | 3 | Dual Shunt (Internal and External) |
| Value                                                                                                                                                                                                                                            | Description                        |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
| 0                                                                                                                                                                                                                                                | No Shunt                           |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
| 1                                                                                                                                                                                                                                                | Internal Shunt                     |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
| 2                                                                                                                                                                                                                                                | External Shunt                     |       |               |               |       |             |   |          |   |                |   |                |   |                                    |
| 3                                                                                                                                                                                                                                                | Dual Shunt (Internal and External) |       |               |               |       |             |   |          |   |                |   |                |   |                                    |



| 2033.03h                                                                                                                                                                                                                                                                                                                                                              | Shunt Regulator Enable Threshold |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                                                                             | 0 – $2^{(15)}-1$                 | DV1   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the shunt regulator enable threshold voltage. When the bus reaches this voltage, built in shut regulator will turn on allow excess energy to be dissipated across an external shunt resistor. Not all drives have built in shunt regulators. See <a href="#">“Appendix” on page 337</a> for unit conversion. |                                  |       |               |               |

| 2033.04h                                                                                                | External Shunt Resistance |                   |               |               |
|---------------------------------------------------------------------------------------------------------|---------------------------|-------------------|---------------|---------------|
| Data Type                                                                                               | Data Range                | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 – $2^{(16)}-1$          | ohms ( $\Omega$ ) | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the resistance of the external shunt resistor. |                           |                   |               |               |

| 2033.05h                                                                                                | External Shunt Inductance |                               |               |               |
|---------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                               | Data Range                | Units                         | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 – $2^{(16)}-1$          | microhenrys ( $\mu\text{H}$ ) | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the inductance of the external shunt resistor. |                           |                               |               |               |

| 2033.06h                                                                                                                          | External Shunt Power |           |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|---------------|---------------|
| Data Type                                                                                                                         | Data Range           | Units     | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                        | 0 – $2^{(16)}-1$     | watts (W) | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the amount of power the external shunt resistor is allowed to dissipate. |                      |           |               |               |

## 2051h: Drive PWM and Servo Period

| 2051.01h                                                                                     | Active PWM Period |       |               |               |
|----------------------------------------------------------------------------------------------|-------------------|-------|---------------|---------------|
| Data Type                                                                                    | Data Range        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                   | 0 – $2^{(16)}-1$  | 10ns  | Read Only     | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the active PWM period in the drive. |                   |       |               |               |

| 2051.02h                                                                                       | Active Servo Period  |       |               |               |
|------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                      | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                     | $0 - [2^{(16)} - 1]$ | ns    | Read Only     | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the active servo period in the drive. |                      |       |               |               |

| 2051.03h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2051.04h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2051.05h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

**2052h: High Speed Capture Configuration Parameters**

| 2052.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Capture 1 Configuration Parameters |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|-------------------|---------------|-------|----------------|-------|----------------|-----|-----------------------------|------|------------------|---|-----------------------------|----|------------------|---|---------------|----|------------------|---|---------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------|----|------------------|----|-------------|----|------------------|----|-------------|----|------------------|----|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                         | Units | Accessibility     | Stored to NVM |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | N/A                                | N/A   | Read / Write      | No            |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <b>Description:</b><br>Contains a value configuring the trigger source and capture signal for Capture 1. Only one capture signal can be selected at a time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                    |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <table><tr><td>Bits</td><td>Description</td></tr><tr><td>0-5</td><td>Trigger Source</td></tr><tr><td>6-7</td><td>Reserved</td></tr><tr><td>8-15</td><td>Signal Selection</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                    |       |                   |               | Bits  | Description    | 0-5   | Trigger Source | 6-7 | Reserved                    | 8-15 | Signal Selection |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Description                        |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 0-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Trigger Source                     |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 6-7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Reserved                           |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 8-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Signal Selection                   |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <table><tr><td>Value</td><td>Trigger Source</td><td>Value</td><td>Trigger Source</td></tr><tr><td>1</td><td>Incremental Encoder 1 Index</td><td>21</td><td>Digital Output 1</td></tr><tr><td>2</td><td>Incremental Encoder 2 Index</td><td>22</td><td>Digital Output 2</td></tr><tr><td>3</td><td>Touch Probe 1</td><td>23</td><td>Digital Output 3</td></tr><tr><td>4</td><td>Touch Probe 2</td><td>24</td><td>Digital Output 4</td></tr><tr><td>5</td><td>Digital Input 1</td><td>25</td><td>Digital Output 5</td></tr><tr><td>6</td><td>Digital Input 2</td><td>26</td><td>Digital Output 6</td></tr><tr><td>7</td><td>Digital Input 3</td><td>27</td><td>Digital Output 7</td></tr><tr><td>8</td><td>Digital Input 4</td><td>28</td><td>Digital Output 8</td></tr><tr><td>9</td><td>Digital Input 5</td><td>29</td><td>Digital Output 9</td></tr><tr><td>10</td><td>Digital Input 6</td><td>30</td><td>Digital Output 10</td></tr><tr><td>11</td><td>Digital Input 7</td><td>31</td><td>Digital Output 11</td></tr><tr><td>12</td><td>Digital Input 8</td><td>32</td><td>Digital Output 12</td></tr><tr><td>13</td><td>Digital Input 9</td><td>33</td><td>Digital Output 13</td></tr><tr><td>14</td><td>Digital Input 10</td><td>34</td><td>Digital Output 14</td></tr><tr><td>15</td><td>Digital Input 11</td><td>35</td><td>Digital Output 15</td></tr><tr><td>16</td><td>Digital Input 12</td><td>36</td><td>Digital Output 16</td></tr><tr><td>17</td><td>Digital Input 13</td><td>37</td><td>Hall Edge A</td></tr><tr><td>18</td><td>Digital Input 14</td><td>38</td><td>Hall Edge B</td></tr><tr><td>19</td><td>Digital Input 15</td><td>39</td><td>Hall Edge C</td></tr><tr><td>20</td><td>Digital Input 16</td><td>40</td><td>Any Hall Edge</td></tr></table> |                                    |       |                   |               | Value | Trigger Source | Value | Trigger Source | 1   | Incremental Encoder 1 Index | 21   | Digital Output 1 | 2 | Incremental Encoder 2 Index | 22 | Digital Output 2 | 3 | Touch Probe 1 | 23 | Digital Output 3 | 4 | Touch Probe 2 | 24 | Digital Output 4 | 5 | Digital Input 1 | 25 | Digital Output 5 | 6 | Digital Input 2 | 26 | Digital Output 6 | 7 | Digital Input 3 | 27 | Digital Output 7 | 8 | Digital Input 4 | 28 | Digital Output 8 | 9 | Digital Input 5 | 29 | Digital Output 9 | 10 | Digital Input 6 | 30 | Digital Output 10 | 11 | Digital Input 7 | 31 | Digital Output 11 | 12 | Digital Input 8 | 32 | Digital Output 12 | 13 | Digital Input 9 | 33 | Digital Output 13 | 14 | Digital Input 10 | 34 | Digital Output 14 | 15 | Digital Input 11 | 35 | Digital Output 15 | 16 | Digital Input 12 | 36 | Digital Output 16 | 17 | Digital Input 13 | 37 | Hall Edge A | 18 | Digital Input 14 | 38 | Hall Edge B | 19 | Digital Input 15 | 39 | Hall Edge C | 20 | Digital Input 16 | 40 | Any Hall Edge |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Trigger Source                     | Value | Trigger Source    |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Incremental Encoder 1 Index        | 21    | Digital Output 1  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Incremental Encoder 2 Index        | 22    | Digital Output 2  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Touch Probe 1                      | 23    | Digital Output 3  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Touch Probe 2                      | 24    | Digital Output 4  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 1                    | 25    | Digital Output 5  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 2                    | 26    | Digital Output 6  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 3                    | 27    | Digital Output 7  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 4                    | 28    | Digital Output 8  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 5                    | 29    | Digital Output 9  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 6                    | 30    | Digital Output 10 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 7                    | 31    | Digital Output 11 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 8                    | 32    | Digital Output 12 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 9                    | 33    | Digital Output 13 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 10                   | 34    | Digital Output 14 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 11                   | 35    | Digital Output 15 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 12                   | 36    | Digital Output 16 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 13                   | 37    | Hall Edge A       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 14                   | 38    | Hall Edge B       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 15                   | 39    | Hall Edge C       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 16                   | 40    | Any Hall Edge     |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Details on the Signal Selection Enum can be found in <a href="#">Table A.3</a> in Appendix B.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |

| 2052.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Capture 2 Configuration Parameters |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|-------------------|---------------|-------|----------------|-------|----------------|-----|-----------------------------|------|------------------|---|-----------------------------|----|------------------|---|---------------|----|------------------|---|---------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|---|-----------------|----|------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|-----------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------------|----|------------------|----|-------------|----|------------------|----|-------------|----|------------------|----|-------------|----|------------------|----|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                         | Units | Accessibility     | Stored to NVM |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | N/A                                | N/A   | Read / Write      | No            |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <b>Description:</b><br>Contains a value configuring the trigger source and capture signal for Capture 2. Only one capture signal can be selected at a time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                    |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <table><tr><th>Bits</th><th>Description</th></tr><tr><td>0-5</td><td>Trigger Source</td></tr><tr><td>6-7</td><td>Reserved</td></tr><tr><td>8-15</td><td>Signal Selection</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                    |       |                   |               | Bits  | Description    | 0-5   | Trigger Source | 6-7 | Reserved                    | 8-15 | Signal Selection |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Description                        |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 0-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Trigger Source                     |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 6-7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Reserved                           |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 8-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Signal Selection                   |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| <table><tr><th>Value</th><th>Trigger Source</th><th>Value</th><th>Trigger Source</th></tr><tr><td>1</td><td>Incremental Encoder 1 Index</td><td>21</td><td>Digital Output 1</td></tr><tr><td>2</td><td>Incremental Encoder 2 Index</td><td>22</td><td>Digital Output 2</td></tr><tr><td>3</td><td>Touch Probe 1</td><td>23</td><td>Digital Output 3</td></tr><tr><td>4</td><td>Touch Probe 2</td><td>24</td><td>Digital Output 4</td></tr><tr><td>5</td><td>Digital Input 1</td><td>25</td><td>Digital Output 5</td></tr><tr><td>6</td><td>Digital Input 2</td><td>26</td><td>Digital Output 6</td></tr><tr><td>7</td><td>Digital Input 3</td><td>27</td><td>Digital Output 7</td></tr><tr><td>8</td><td>Digital Input 4</td><td>28</td><td>Digital Output 8</td></tr><tr><td>9</td><td>Digital Input 5</td><td>29</td><td>Digital Output 9</td></tr><tr><td>10</td><td>Digital Input 6</td><td>30</td><td>Digital Output 10</td></tr><tr><td>11</td><td>Digital Input 7</td><td>31</td><td>Digital Output 11</td></tr><tr><td>12</td><td>Digital Input 8</td><td>32</td><td>Digital Output 12</td></tr><tr><td>13</td><td>Digital Input 9</td><td>33</td><td>Digital Output 13</td></tr><tr><td>14</td><td>Digital Input 10</td><td>34</td><td>Digital Output 14</td></tr><tr><td>15</td><td>Digital Input 11</td><td>35</td><td>Digital Output 15</td></tr><tr><td>16</td><td>Digital Input 12</td><td>36</td><td>Digital Output 16</td></tr><tr><td>17</td><td>Digital Input 13</td><td>37</td><td>Hall Edge A</td></tr><tr><td>18</td><td>Digital Input 14</td><td>38</td><td>Hall Edge B</td></tr><tr><td>19</td><td>Digital Input 15</td><td>39</td><td>Hall Edge C</td></tr><tr><td>20</td><td>Digital Input 16</td><td>40</td><td>Any Hall Edge</td></tr></table> |                                    |       |                   |               | Value | Trigger Source | Value | Trigger Source | 1   | Incremental Encoder 1 Index | 21   | Digital Output 1 | 2 | Incremental Encoder 2 Index | 22 | Digital Output 2 | 3 | Touch Probe 1 | 23 | Digital Output 3 | 4 | Touch Probe 2 | 24 | Digital Output 4 | 5 | Digital Input 1 | 25 | Digital Output 5 | 6 | Digital Input 2 | 26 | Digital Output 6 | 7 | Digital Input 3 | 27 | Digital Output 7 | 8 | Digital Input 4 | 28 | Digital Output 8 | 9 | Digital Input 5 | 29 | Digital Output 9 | 10 | Digital Input 6 | 30 | Digital Output 10 | 11 | Digital Input 7 | 31 | Digital Output 11 | 12 | Digital Input 8 | 32 | Digital Output 12 | 13 | Digital Input 9 | 33 | Digital Output 13 | 14 | Digital Input 10 | 34 | Digital Output 14 | 15 | Digital Input 11 | 35 | Digital Output 15 | 16 | Digital Input 12 | 36 | Digital Output 16 | 17 | Digital Input 13 | 37 | Hall Edge A | 18 | Digital Input 14 | 38 | Hall Edge B | 19 | Digital Input 15 | 39 | Hall Edge C | 20 | Digital Input 16 | 40 | Any Hall Edge |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Trigger Source                     | Value | Trigger Source    |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Incremental Encoder 1 Index        | 21    | Digital Output 1  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Incremental Encoder 2 Index        | 22    | Digital Output 2  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Touch Probe 1                      | 23    | Digital Output 3  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Touch Probe 2                      | 24    | Digital Output 4  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 1                    | 25    | Digital Output 5  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 2                    | 26    | Digital Output 6  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 3                    | 27    | Digital Output 7  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 4                    | 28    | Digital Output 8  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 5                    | 29    | Digital Output 9  |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 6                    | 30    | Digital Output 10 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 7                    | 31    | Digital Output 11 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 8                    | 32    | Digital Output 12 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 9                    | 33    | Digital Output 13 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 10                   | 34    | Digital Output 14 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 11                   | 35    | Digital Output 15 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 12                   | 36    | Digital Output 16 |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 13                   | 37    | Hall Edge A       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 14                   | 38    | Hall Edge B       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 15                   | 39    | Hall Edge C       |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 16                   | 40    | Any Hall Edge     |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |
| Details on the Signal Selection Enum can be found in <a href="#">Table A.3</a> in Appendix B.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |       |                   |               |       |                |       |                |     |                             |      |                  |   |                             |    |                  |   |               |    |                  |   |               |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |   |                 |    |                  |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                 |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |                   |    |                  |    |             |    |                  |    |             |    |                  |    |             |    |                  |    |               |

**2053h: Capture Values**

| 2053.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Capture Status                   |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|------|-------------|---|-------------------|---|-----------------|---|----------------------------------|---|----------------------------------|-----|----------|---|-------------------|---|-----------------|---|----------------------------------|----|----------------------------------|-------|----------|----|--------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range                       | Units | Accessibility | Stored to NVM |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | N/A                              | N/A   | Read Only     | No            |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| <b>Description:</b><br>Returns a bitfield of status events of the capture module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| <table><tr><th>Word</th><th>Description</th></tr><tr><td>0</td><td>Capture 1 Enabled</td></tr><tr><td>1</td><td>Capture 1 Armed</td></tr><tr><td>2</td><td>Capture 1 Positive Edge Captured</td></tr><tr><td>3</td><td>Capture 1 Negative Edge Captured</td></tr><tr><td>4-6</td><td>Reserved</td></tr><tr><td>7</td><td>Capture 2 Enabled</td></tr><tr><td>8</td><td>Capture 2 Armed</td></tr><tr><td>9</td><td>Capture 2 Positive Edge Captured</td></tr><tr><td>10</td><td>Capture 2 Negative Edge Captured</td></tr><tr><td>11-14</td><td>Reserved</td></tr><tr><td>15</td><td>Touch Probe Active</td></tr></table> |                                  |       |               |               | Word | Description | 0 | Capture 1 Enabled | 1 | Capture 1 Armed | 2 | Capture 1 Positive Edge Captured | 3 | Capture 1 Negative Edge Captured | 4-6 | Reserved | 7 | Capture 2 Enabled | 8 | Capture 2 Armed | 9 | Capture 2 Positive Edge Captured | 10 | Capture 2 Negative Edge Captured | 11-14 | Reserved | 15 | Touch Probe Active |
| Word                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Description                      |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 1 Enabled                |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 1 Armed                  |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 1 Positive Edge Captured |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 1 Negative Edge Captured |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 4-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Reserved                         |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 2 Enabled                |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 2 Armed                  |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Capture 2 Positive Edge Captured |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Capture 2 Negative Edge Captured |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 11-14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Reserved                         |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Touch Probe Active               |       |               |               |      |             |   |                   |   |                 |   |                                  |   |                                  |     |          |   |                   |   |                 |   |                                  |    |                                  |       |          |    |                    |

| 2053.02h                                                                                                                                                                                                                                         | Capture 1 Last Rising Edge        |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the captured rising edge.                                                                                                                                            |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.03h                                                                                                                                                                                                                                         | Capture 1 Last Falling Edge       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the captured rising edge.                                                                                                                                            |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.04h                                                                                                                                                                                                                                         | Capture 1 Last Capture            |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the last capture.                                                                                                                                                    |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.05h                                                                                                                                                                                                                                         | Capture 1 History Capture 1       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the second most recent capture.                                                                                                                                      |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.06h                                                                                                                                                                                                                                         | Capture 1 History Capture 2       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the third most recent capture.                                                                                                                                       |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.07h                                                                                                                                                                                                                                         | Capture 1 History Capture 3       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the fourth most recent capture.                                                                                                                                      |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.08h                                                                                                                                                                                                                                         | Capture 1 History Capture 4       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the fifth most recent capture.                                                                                                                                       |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.09h                                                                                                                                                                                                                                         | Capture 2 Last Rising Edge        |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the captured rising edge.                                                                                                                                            |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.0Ah                                                                                                                                                                                                                                         | Capture 2 Last Falling Edge       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the captured rising edge.                                                                                                                                            |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.0Bh                                                                                                                                                                                                                                         | Capture 2 Last Capture            |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the last capture.                                                                                                                                                    |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |



| 2053.0Ch                                                                                                                                                                                                                                         | Capture 2 History Capture 1       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the second most recent capture.                                                                                                                                      |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.0Dh                                                                                                                                                                                                                                         | Capture 2 History Capture 2       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the third most recent capture.                                                                                                                                       |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.0Eh                                                                                                                                                                                                                                         | Capture 2 History Capture 3       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the fourth most recent capture.                                                                                                                                      |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

| 2053.0Fh                                                                                                                                                                                                                                         | Capture 2 History Capture 4       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|------|-------------|---|----------------|---|---------|-----|-----------------------------------|-----|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |      |             |   |                |   |         |     |                                   |     |               |
| Structure                                                                                                                                                                                                                                        | N/A                               | N/A   | Read Only     | No            |      |             |   |                |   |         |     |                                   |     |               |
| <b>Description:</b><br>Contains a structure detailing various parameters at the fifth most recent capture.                                                                                                                                       |                                   |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| <table><tr><td>Word</td><td>Description</td></tr><tr><td>0</td><td>Edge Type Enum</td></tr><tr><td>1</td><td>Counter</td></tr><tr><td>2-3</td><td>Capture Time Stamp (units of 5ns)</td></tr><tr><td>4-5</td><td>Capture Value</td></tr></table> |                                   |       |               |               | Word | Description | 0 | Edge Type Enum | 1 | Counter | 2-3 | Capture Time Stamp (units of 5ns) | 4-5 | Capture Value |
| Word                                                                                                                                                                                                                                             | Description                       |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 0                                                                                                                                                                                                                                                | Edge Type Enum                    |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 1                                                                                                                                                                                                                                                | Counter                           |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 2-3                                                                                                                                                                                                                                              | Capture Time Stamp (units of 5ns) |       |               |               |      |             |   |                |   |         |     |                                   |     |               |
| 4-5                                                                                                                                                                                                                                              | Capture Value                     |       |               |               |      |             |   |                |   |         |     |                                   |     |               |

### 20F1h: High Speed Capture Control

| 20F1.00h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | High Speed Capture Control           |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|------|-------------|---|-------------------|---|--------------------------------------|---|----------------------------------|---|----------------------------------|-----|----------|---|-------------------|---|--------------------------------------|----|----------------------------------|----|----------------------------------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A                                  | N/A   | Read Only     | No            |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| <b>Description:</b><br>Contains a bitfield representing the High Speed Capture configuration parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                      |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| <table><tr><th>Bits</th><th>Description</th></tr><tr><td>0</td><td>Capture 1 Enabled</td></tr><tr><td>1</td><td>Capture 1 Continuous Trigger Enabled</td></tr><tr><td>2</td><td>Capture 1 Positive Edge Captured</td></tr><tr><td>3</td><td>Capture 1 Negative Edge Captured</td></tr><tr><td>4-7</td><td>Reserved</td></tr><tr><td>8</td><td>Capture 2 Enabled</td></tr><tr><td>9</td><td>Capture 2 Continuous Trigger Enabled</td></tr><tr><td>10</td><td>Capture 2 Positive Edge Captured</td></tr><tr><td>11</td><td>Capture 2 Negative Edge Captured</td></tr><tr><td>12-15</td><td>Reserved</td></tr></table> |                                      |       |               |               | Bits | Description | 0 | Capture 1 Enabled | 1 | Capture 1 Continuous Trigger Enabled | 2 | Capture 1 Positive Edge Captured | 3 | Capture 1 Negative Edge Captured | 4-7 | Reserved | 8 | Capture 2 Enabled | 9 | Capture 2 Continuous Trigger Enabled | 10 | Capture 2 Positive Edge Captured | 11 | Capture 2 Negative Edge Captured | 12-15 | Reserved |
| Bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Description                          |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 1 Enabled                    |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 1 Continuous Trigger Enabled |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 1 Positive Edge Captured     |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 1 Negative Edge Captured     |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 4-7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Reserved                             |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 2 Enabled                    |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Capture 2 Continuous Trigger Enabled |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Capture 2 Positive Edge Captured     |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Capture 2 Negative Edge Captured     |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |
| 12-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Reserved                             |       |               |               |      |             |   |                   |   |                                      |   |                                  |   |                                  |     |          |   |                   |   |                                      |    |                                  |    |                                  |       |          |

**60B8h: Touch Probe Function**

| 60B8.00h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Touch Probe Function                 |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|----------------|-------------|-------|----------------------|---|----------------------------|-----|------------------------|---|----------------------------------|---|-----------------------------------|---|--------------------------------------|---|----------|---|----------------------|---|----------------------------|-------|------------------------|----|----------------------------------|----|-----------------------------------|----|--------------------------------------|----|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | See Table                            | N/A   | Read / Write  | No            |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| <b>Description:</b><br>Used to configure Touch Probe 1 and Touch Probe 2. It is used to assign the signal source, trigger source, and edge type. An edge must be selected for each probe, even if they are disabled. In continuous trigger/roll mode, a value is captured each time the probe is triggered, without having to reset. The Use Capture Configuration bits have priority over the Trigger Source bits.                                                                                                                                                                                                                                                                                                                                                                                                                             |                                      |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Enable Touch Probe 1</td></tr><tr><td>1</td><td>Probe 1 Continuous Trigger</td></tr><tr><td>2-3</td><td>Probe 1 Trigger Source</td></tr><tr><td>4</td><td>Probe 1 Triggering Edge - Rising</td></tr><tr><td>5</td><td>Probe 1 Triggering Edge - Falling</td></tr><tr><td>6</td><td>Use Capture Configuration 1 Settings</td></tr><tr><td>7</td><td>Reserved</td></tr><tr><td>8</td><td>Enable Touch Probe 2</td></tr><tr><td>9</td><td>Probe 2 Continuous Trigger</td></tr><tr><td>10-11</td><td>Probe 2 Trigger Source</td></tr><tr><td>12</td><td>Probe 2 Triggering Edge - Rising</td></tr><tr><td>13</td><td>Probe 2 Triggering Edge - Falling</td></tr><tr><td>14</td><td>Use Capture Configuration 2 Settings</td></tr><tr><td>15</td><td>Reserved</td></tr></table> |                                      |       |               |               | Bit(s)         | Description | 0     | Enable Touch Probe 1 | 1 | Probe 1 Continuous Trigger | 2-3 | Probe 1 Trigger Source | 4 | Probe 1 Triggering Edge - Rising | 5 | Probe 1 Triggering Edge - Falling | 6 | Use Capture Configuration 1 Settings | 7 | Reserved | 8 | Enable Touch Probe 2 | 9 | Probe 2 Continuous Trigger | 10-11 | Probe 2 Trigger Source | 12 | Probe 2 Triggering Edge - Rising | 13 | Probe 2 Triggering Edge - Falling | 14 | Use Capture Configuration 2 Settings | 15 | Reserved |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Description                          |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Enable Touch Probe 1                 |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Probe 1 Continuous Trigger           |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 2-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Probe 1 Trigger Source               |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Probe 1 Triggering Edge - Rising     |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Probe 1 Triggering Edge - Falling    |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Use Capture Configuration 1 Settings |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Reserved                             |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Enable Touch Probe 2                 |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Probe 2 Continuous Trigger           |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 10-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Probe 2 Trigger Source               |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Probe 2 Triggering Edge - Rising     |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Probe 2 Triggering Edge - Falling    |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Use Capture Configuration 2 Settings |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Reserved                             |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| <table><tr><th colspan="2">Trigger Source</th></tr><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Touch Probe Input</td></tr><tr><td>1</td><td>Encoder Index</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |       |               |               | Trigger Source |             | Value | Description          | 0 | Touch Probe Input          | 1   | Encoder Index          |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| Trigger Source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                          |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Touch Probe Input                    |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Encoder Index                        |       |               |               |                |             |       |                      |   |                            |     |                        |   |                                  |   |                                   |   |                                      |   |          |   |                      |   |                            |       |                        |    |                                  |    |                                   |    |                                      |    |          |

**60B9h: Touch Probe Status**

| 60B9.00h                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Touch Probe Status           |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|--------|-------------|---|----------------|---|-----------------------------|---|------------------------------|-----|----------|---|----------------|---|-----------------------------|----|------------------------------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                   | N/A                          | N/A   | Read Only     | No            |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| <b>Description:</b><br>Returns a bitfield of status events for the touch probe module. If either Store Edge bit is high and the Touch Probe is not configured for continuous trigger, the Touch Probe will not store any additional captures. To enable captures again, the probe must be disabled then re-enabled.                                                                                                                                          |                              |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Probe 1 Enable</td></tr><tr><td>1</td><td>Probe 1 Store Edge - Rising</td></tr><tr><td>2</td><td>Probe 1 Store Edge - Falling</td></tr><tr><td>3-7</td><td>Reserved</td></tr><tr><td>8</td><td>Probe 2 Enable</td></tr><tr><td>9</td><td>Probe 2 Store Edge - Rising</td></tr><tr><td>10</td><td>Probe 2 Store Edge - Falling</td></tr><tr><td>11-15</td><td>Reserved</td></tr></table> |                              |       |               |               | Bit(s) | Description | 0 | Probe 1 Enable | 1 | Probe 1 Store Edge - Rising | 2 | Probe 1 Store Edge - Falling | 3-7 | Reserved | 8 | Probe 2 Enable | 9 | Probe 2 Store Edge - Rising | 10 | Probe 2 Store Edge - Falling | 11-15 | Reserved |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Description                  |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Probe 1 Enable               |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Probe 1 Store Edge - Rising  |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Probe 1 Store Edge - Falling |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 3-7                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reserved                     |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Probe 2 Enable               |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Probe 2 Store Edge - Rising  |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Probe 2 Store Edge - Falling |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |
| 11-15                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Reserved                     |       |               |               |        |             |   |                |   |                             |   |                              |     |          |   |                |   |                             |    |                              |       |          |

**60BAh: Touch Probe 1 Positive Edge**

| 60BA.00h                                                                                                                                    | Touch Probe 1 Positive Edge |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                   | Data Range                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                   | N/A                         | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the value of the signal source assigned to Touch Probe 1 that was captured at the last positive/rising edge. |                             |       |               |               |

**60BBh: Touch Probe 1 Negative Edge**

| 60BB.00h                                                                                                                                     | Touch Probe 1 Negative Edge |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                    | N/A                         | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the value of the signal source assigned to Touch Probe 1 that was captured at the last negative/falling edge. |                             |       |               |               |

**60BCh: Touch Probe 2 Positive Edge**

| 60BC.00h                                                                                                                                    | Touch Probe 2 Positive Edge |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                   | Data Range                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                   | N/A                         | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the value of the signal source assigned to Touch Probe 2 that was captured at the last positive/rising edge. |                             |       |               |               |

**60BDh: Touch Probe 2 Negative Edge**

| 60BD.00h                                                                                                                                     | Touch Probe 1 Negative Edge |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                  | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                    | N/A                         | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the value of the signal source assigned to Touch Probe 2 that was captured at the last negative/falling edge. |                             |       |               |               |

**60D1h: Touch Probe 1 Positive Value Time Stamp**

| 60D1.00h                                                                            | Touch Probe 1 Positive Value Time Stamp |       |               |               |
|-------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                           | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                          | N/A                                     | 5ns   | Read Only     | No            |
| <b>Description:</b><br>Returns the time that the last rising edge capture occurred. |                                         |       |               |               |

**60D2h: Touch Probe 1 Negative Value Time Stamp**

| 60D2.00h                                                                             | Touch Probe 1 Negative Value Time Stamp |       |               |               |
|--------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                            | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                           | N/A                                     | 5ns   | Read Only     | No            |
| <b>Description:</b><br>Returns the time that the last falling edge capture occurred. |                                         |       |               |               |

**60D3h: Touch Probe 2 Positive Value Time Stamp**

| 60D3.00h                                                                            | Touch Probe 2 Positive Value Time Stamp |       |               |               |
|-------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                           | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                          | N/A                                     | 5ns   | Read Only     | No            |
| <b>Description:</b><br>Returns the time that the last rising edge capture occurred. |                                         |       |               |               |

**60D4h: Touch Probe 2 Negative Value Time Stamp**

| 60D4.00h                                                                             | Touch Probe 2 Negative Value Time Stamp |       |               |               |
|--------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                            | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                           | N/A                                     | 5ns   | Read Only     | No            |
| <b>Description:</b><br>Returns the time that the last falling edge capture occurred. |                                         |       |               |               |

**60D5h: Touch Probe 1 Positive Edge Counter**

| 60D5.00h                                                                                                                                                             | Touch Probe 1 Positive Edge Counter |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | N/A                                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the rising edge counter value. The rising edge counter value is the number of rising edge captures that have occurred since power-up. |                                     |       |               |               |

**60D6h: Touch Probe 1 Negative Edge Counter**

| 60D6.00h                                                                                                                                                                | Touch Probe 1 Negative Edge Counter |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | N/A                                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the falling edge counter value. The falling edge counter value is the number of falling edge captures that have occurred since power-up. |                                     |       |               |               |

**60D7h: Touch Probe 2 Positive Edge Counter**

| 60D7.00h                                                                                                                                                             | Touch Probe 2 Positive Edge Counter |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                           | N/A                                 | 5ns   | Read Only     | No            |
| <b>Description:</b><br>Returns the rising edge counter value. The rising edge counter value is the number of rising edge captures that have occurred since power-up. |                                     |       |               |               |

**60D8h: Touch Probe 2 Negative Edge Counter**

| 60D8.00h                                                                                                                                                                | Touch Probe 2 Negative Edge Counter |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | N/A                                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>Returns the falling edge counter value. The falling edge counter value is the number of falling edge captures that have occurred since power-up. |                                     |       |               |               |

**2021h: Drive Temperature Values**

| 2021.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | External Thermal Sense Value |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | $[-2^{(31)}] - [2^{(31)}-1]$ | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the external thermal sense value. This value represents the motor temperature value detected by the drive. To determine the physical temperature, use the following formula:<br><br>(Thermal Sense Value) / 65536 = Temperature measured by drive (in °C)<br><br>Example: The reported External Thermal Sense Value is 1234567 (decimal). The temperature measured by the drive is therefore (1234567/65536) = 18.8 °C |                              |       |               |               |

| 2021.02h                                                                                                                     | Thermistor Resistance |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                                    | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                   | $0 - [2^{(16)}-1]$    | Ohms  | Read Only     | No            |
| <b>Description:</b><br>If supported by the hardware, this value represents the measured thermistor resistance value in ohms. |                       |       |               |               |

| 2021.03h                                                                                                                                                                                                                | Drive Operating Temperature |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                                               | Data Range                  | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                              | $0 - [2^{(16)}-1]$          | 0.25°C | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the value reported by the drive's temperature sensor. Note that this value will be 0 on FlexPro drives that do not support the appropriate temperature sensor. |                             |        |               |               |

| 2021.04h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

**2115h: Thermal Monitor Configuration**

| 2115.01h                                                                                            | Thermal Monitor Configuration |                                                                                                                                                                                                                                                                                                                                                      |               |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                           | Data Range                    | Units                                                                                                                                                                                                                                                                                                                                                | Accessibility | Stored to NVM |
| Unsigned16                                                                                          | N/A                           | N/A                                                                                                                                                                                                                                                                                                                                                  | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the bitfield detailing the configuration of temperature monitoring. |                               |                                                                                                                                                                                                                                                                                                                                                      |               |               |
| Bits                                                                                                | Name                          | Description                                                                                                                                                                                                                                                                                                                                          |               |               |
| 7-0                                                                                                 | Thermistor Configuration      | Configures the operation of the thermistor/switch<br>0: Disabled (default)<br>1: Thermistor Active<br>2: Switch Active Closed<br>3: Switch Active Open                                                                                                                                                                                               |               |               |
| 15-8                                                                                                | Thermal Monitor Configuration | Configures the operation of the drive's thermal monitor<br>0: Disabled (default)<br>1: Enable External Thermal Monitor, using user parameters<br>2: Enable the Drive Thermal Monitor, using drive parameters<br>3: Enable the Drive Thermal Monitor, using the lesser of the parameter sets<br>4: Enable both the External and Drive Thermal Monitor |               |               |

\*Note that Drive Thermal Monitor is not supported on all FlexPro models.

| 2115.02h                                                                                                                                             |            | Thermistor Disable Resistance |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range | Units                         | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - 5000   | ohms                          | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the measured thermistor resistance when the Motor Over Temperature Event will be triggered. |            |                               |               |               |

| 2115.03h                                                                                                                                           |            | Thermistor Enable Resistance |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------|---------------|---------------|
| Data Type                                                                                                                                          | Data Range | Units                        | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                         | 0 - 5000   | ohms                         | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the measured thermistor resistance when the Motor Over Temperature Event will be cleared. |            |                              |               |               |

| 2115.04h                                                                                                                |              | Thermistor Offset Resistance |               |               |
|-------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------|---------------|---------------|
| Data Type                                                                                                               | Data Range   | Units                        | Accessibility | Stored to NVM |
| Integer16                                                                                                               | -2500 - 2500 | ohms                         | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to an offset that is added to the measured thermistor resistance. |              |                              |               |               |



| 2115.05h                                                                                                               | External Temperature Control |                                    |                                                                                        |               |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------|----------------------------------------------------------------------------------------|---------------|
| Data Type                                                                                                              | Data Range                   | Units                              | Accessibility                                                                          | Stored to NVM |
| Structure                                                                                                              | N/A                          | DT1                                | Read / Write                                                                           | Yes           |
| <b>Description:</b><br>Contains a structure containing the temperature configuration for the External Thermal Monitor. |                              |                                    |                                                                                        |               |
|                                                                                                                        | Offset                       | Name                               | Description                                                                            |               |
|                                                                                                                        | 0                            | External Disable Temperature Level | The temperature at which the drive will disable due to a Motor Over Temperature fault. |               |
|                                                                                                                        | 2                            | External Rated Temperature Level   | The temperature at which the drive will start limiting current.                        |               |

| 2115.06h                                                                                                                                                                                                                                                                                                                                          | Thermal Monitor Hysteresis |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                         | Data Range                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                        | 6554 - $[2^{(16)} - 1]$    | %     | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the percentage of the shutdown temperature at which the drive will re-enable. A value of 6554 represents 10%. For example, a drive with a shutdown temperature of 100 degrees Celsius with a hysteresis of 10% will re-enable once the external temperature drops to 90 degrees Celsius. |                            |       |               |               |

| 2115.07h                                                                                         | Thermal Monitor Time Constant |             |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------|-------------|---------------|---------------|
| Data Type                                                                                        | Data Range                    | Units       | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - 35999                     | 0.1 seconds | Read / Write  | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the motor/system thermal time constant. |                               |             |               |               |

## 2058h: Digital Input Parameters

**TABLE 2.2 Object 2058 Mapping**

| Bit    | Digital Input Mask* |
|--------|---------------------|
| 0      | Digital Input 1     |
| 1      | Digital Input 2     |
| 2      | Digital Input 3     |
| 3      | Digital Input 4     |
| 4      | Digital Input 5     |
| 5      | Digital Input 6     |
| 6      | Digital Input 7     |
| 7      | Digital Input 8     |
| 8...15 | Reserved            |

\* Number of actual inputs depends on drive model

| 2058.01h                                                                                                                                                    | Digital Input Mask: Active Level |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                  | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Determines which digital inputs are active high and which are active low. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.02h                                                                                                                                              | Digital Input Mask: User Disable |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to User Disable. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.03h                                                                                                                                                    | Digital Input Mask: Positive Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                  | 0 - $2^{(16)} - 1$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the positive limit. See <a href="#">Table 2.2</a> above for mapping structure. |                                    |       |               |               |

| 2058.04h                                                                                                                                                | Digital Input Mask: Negative Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                               | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                              | 0 - $2^{(16)} - 1$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to negative limit. See <a href="#">Table 2.2</a> above for mapping structure. |                                    |       |               |               |

| 2058.05h                                                                                                                                                                 | Digital Input Mask: Motor Over Temperature |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to activate Motor Over Temperature. See <a href="#">Table 2.2</a> above for mapping structure. |                                            |       |               |               |

| 2058.06h                                                                                                                                                          | Digital Input Mask: Phase Detection |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to activate Phase Detection. See <a href="#">Table 2.2</a> above for mapping structure. |                                     |       |               |               |

| 2058.07h                                                                                                                                                                | Digital Input Mask: Auxiliary Disable |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to activate the Auxiliary Disable. See <a href="#">Table 2.2</a> above for mapping structure. |                                       |       |               |               |

| 2058.08h                                                                                                                                                                 | Digital Input Mask: Set Position |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to activate the Set Position event. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.09h                                                                                                                                                                 | Digital Input Mask: Start Homing |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to activate the Start Homing event. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.0Ah                                                                                                                                                 | Digital Input Mask: Home Switch |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                               | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Home Switch. See <a href="#">Table 2.2</a> above for mapping structure. |                                 |       |               |               |

| 2058.0Bh                                                                                                                                                | Digital Input Mask: User Stop |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                               | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                              | 0 - $[2^{(16)} - 1]$          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Stop event. See <a href="#">Table 2.2</a> above for mapping structure. |                               |       |               |               |

| 2058.0Ch                                                                                                                                                                 | Digital Input Mask: Set / Reset Capture A |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Set / Reset Capture A event. See <a href="#">Table 2.2</a> above for mapping structure. |                                           |       |               |               |

| 2058.0Dh                                                                                                                                                                 | Digital Input Mask: Set / Reset Capture B |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Set / Reset Capture B event. See <a href="#">Table 2.2</a> above for mapping structure. |                                           |       |               |               |

| 2058.0Eh                                                                                                                                                                 | Digital Input Mask: Set / Reset Capture C |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Set / Reset Capture C event. See <a href="#">Table 2.2</a> above for mapping structure. |                                           |       |               |               |

| 2058.0Fh                                                                                                                                                               | Digital Input Mask: Reset Event History |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Reset Event History event. See <a href="#">Table 2.2</a> above for mapping structure. |                                         |       |               |               |

| 2058.10h                                                                                                                                                                  | Digital Input Mask: Configuration Select 0 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Configuration Select 0 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                            |       |               |               |

| 2058.11h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read / Write  | Yes           |

| 2058.12h                                                                                                                                                         | Digital Input Mask: Gain Select 0 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $2^{(16)} - 1$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Gain Select 0 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                   |       |               |               |

| 2058.13h                                                                                                                                                               | Digital Input Mask: Zero Position Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $2^{(16)} - 1$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Zero Position Error event. See <a href="#">Table 2.2</a> above for mapping structure. |                                         |       |               |               |

| 2058.14h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read / Write  | Yes           |

| 2058.15h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read / Write  | Yes           |

| 2058.16h                                                                                                                                                              | Digital Input Mask: Motion Engine Mode |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $2^{(16)} - 1$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Engine Mode event. See <a href="#">Table 2.2</a> above for mapping structure. |                                        |       |               |               |

| 2058.17h                                                                                                                                                                | Digital Input Mask: Motion Engine Enable |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $2^{(16)} - 1$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Enable Enable event. See <a href="#">Table 2.2</a> above for mapping structure. |                                          |       |               |               |

| 2058.18h                                                                                                                                                          | Digital Input Mask: Motion Execute |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Execute event. See <a href="#">Table 2.2</a> above for mapping structure. |                                    |       |               |               |

| 2058.19h                                                                                                                                                           | Digital Input Mask: Motion Select 0 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Select 0 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                     |       |               |               |

| 2058.1Ah                                                                                                                                                           | Digital Input Mask: Motion Select 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Select 1 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                     |       |               |               |

| 2058.1Bh                                                                                                                                                           | Digital Input Mask: Motion Select 2 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Select 2 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                     |       |               |               |

| 2058.1Ch                                                                                                                                                           | Digital Input Mask: Motion Select 3 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Select 3 event. See <a href="#">Table 2.2</a> above for mapping structure. |                                     |       |               |               |

| 2058.1Dh                                                                                                                                                               | Digital Input Mask: Motion Engine Abort |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Motion Engine Abort event. See <a href="#">Table 2.2</a> above for mapping structure. |                                         |       |               |               |

| 2058.1Eh                                                                                                                                                    | Digital Input Mask: Jog Plus |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                   | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                  | 0 - $[2^{(16)} - 1]$         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Jog Plus event. See <a href="#">Table 2.2</a> above for mapping structure. |                              |       |               |               |

| 2058.1Fh                                                                                                                                                     | Digital Input Mask: Jog Minus |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                   | 0 - $[2^{(16)} - 1]$          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Jog Minus event. See <a href="#">Table 2.2</a> above for mapping structure. |                               |       |               |               |

| 2058.20h                                                                                                                                                        | Digital Input Mask: Jog 0 Select |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Jog 0 Select event. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.21h                                                                                                                                                        | Digital Input Mask: Jog 1 Select |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital inputs, if any, are assigned to the Jog 1 Select event. See <a href="#">Table 2.2</a> above for mapping structure. |                                  |       |               |               |

| 2058.22h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

## 205Ah: Digital Output Parameters

TABLE 2.3 Object 205A Mapping

| Bit | Digital Output Mask |
|-----|---------------------|
| 0   | Digital Output 1    |
| 1   | Digital Output 2    |
| 2   | Digital Output 3    |

|        |                  |
|--------|------------------|
| 3      | Digital Output 4 |
| 4...15 | Reserved         |

| 205A.01h                                                                                                                                                  | Digital Output Mask: Active Level |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                | 0 - $[2^{(16)} - 1]$              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs are active high and which are active low. See <a href="#">Table 2.3</a> above for mapping structure. |                                   |       |               |               |

| 205A.02h                                                                                                                                                        | Digital Output Mask: Drive Reset |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Drive Reset event. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.03h                                                                                                                                                                 | Digital Output Mask: Drive Internal Error |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Drive Internal Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.04h                                                                                                                                                                | Digital Output Mask: Short Circuit Fault |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Short Circuit Fault event. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.05h                                                                                                                                                         | Digital Output Mask: Over-Current Fault |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Over-Current event. See <a href="#">Table 2.3</a> above for mapping structure. |                                         |       |               |               |



| 205A.06h                                                                                                                                                                   | Digital Output Mask: Hardware Under Voltage |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Hardware Under Voltage event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.07h                                                                                                                                                                  | Digital Output Mask: Hardware Over Voltage |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Hardware Over Voltage event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.08h                                                                                                                                                                   | Digital Output Mask: Drive Over Temperature |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Drive Over Temperature event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.09h                                                                                                                                                                    | Digital Output Mask: Parameter Restore Error |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Parameter Restore Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.0Ah                                                                                                                                                                  | Digital Output Mask: Parameter Store Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Parameter Store Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.0Bh                                                                                                                                                               | Digital Output Mask: Invalid Hall State |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Invalid Hall State event. See <a href="#">Table 2.3</a> above for mapping structure. |                                         |       |               |               |

| 205A.0Ch                                                                                                                                                                        | Digital Output Mask: Phase Synchronization Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Phase Synchronization Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                  |       |               |               |

| 205A.0Dh                                                                                                                                                                   | Digital Output Mask: Motor Over Temperature |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Motor Over Temperature event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.0Eh                                                                                                                                                                  | Digital Output Mask: Phase Detection Fault |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Phase Detection Fault event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.0Fh                                                                                                                                                                  | Digital Output Mask: Feedback Sensor Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Feedback Sensor Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.10h                                                                                                                                                             | Digital Output Mask: Log Entry Missed |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Log Entry Missed event. See <a href="#">Table 2.3</a> above for mapping structure. |                                       |       |               |               |

| 205A.11h                                                                                                                                                             | Digital Output Mask: Software Disable |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Software Disable event. See <a href="#">Table 2.3</a> above for mapping structure. |                                       |       |               |               |

| 205A.12h                                                                                                                                                         | Digital Output Mask: User Disable |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the User Disable event. See <a href="#">Table 2.3</a> above for mapping structure. |                                   |       |               |               |

| 205A.13h                                                                                                                                                           | Digital Output Mask: User Positive Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Positive Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.14h                                                                                                                                                           | Digital Output Mask: User Negative Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Negative Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.15h                                                                                                                                                             | Digital Output Mask: Current Limiting (Foldback) |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Current Limiting event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                  |       |               |               |

| 205A.16h                                                                                                                                                                             | Digital Output Mask: Continuous Current Limit Reached |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Continuous Current Limit Reached event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                       |       |               |               |

| 205A.17h                                                                                                                                                                   | Digital Output Mask: Current Loop Saturated |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Current Loop Saturated event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.18h                                                                                                                                                               | Digital Output Mask: User Under Voltage |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the User Under Voltage event. See <a href="#">Table 2.3</a> above for mapping structure. |                                         |       |               |               |

| 205A.19h                                                                                                                                                              | Digital Output Mask: User Over Voltage |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the User Over Voltage event. See <a href="#">Table 2.3</a> above for mapping structure. |                                        |       |               |               |

| 205A.1Ah                                                                                                                                                                 | Digital Output Mask: Non-Sinusoidal Commutation |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Non-Sinusoidal Commutation. See <a href="#">Table 2.3</a> above for mapping structure. |                                                 |       |               |               |

| 205A.1Bh                                                                                                                                                            | Digital Output Mask: Phase Detection |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Phase Detection event. See <a href="#">Table 2.3</a> above for mapping structure. |                                      |       |               |               |

| 205A.1Ch                                                                                                                                                                   | Digital Output Mask: User Auxiliary Disable |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the User Auxiliary Disable event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.1Dh                                                                                                                                                            | Digital Output Mask: Shunt Regulator |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Shunt Regulator event. See <a href="#">Table 2.3</a> above for mapping structure. |                                      |       |               |               |

| 205A.1Eh                                                                                                                                                                     | Digital Output Mask: Phase Detection Complete |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Phase Detection Complete event. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.1Fh                                                                                                                                                                   | Digital Output Mask: Command Limiter Active |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Command Limiter Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.20h                                                                                                                                                             | Digital Output Mask: Motor Over Speed |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Motor Over Speed event. See <a href="#">Table 2.3</a> above for mapping structure. |                                       |       |               |               |

| 205A.21h                                                                                                                                                       | Digital Output Mask: At Command |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the At Command event. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.22h                                                                                                                                                          | Digital Output Mask: Zero Velocity |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Zero Velocity event. See <a href="#">Table 2.3</a> above for mapping structure. |                                    |       |               |               |

| 205A.23h                                                                                                                                                                     | Digital Output Mask: Velocity Following Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Velocity Following Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.24h                                                                                                                                                                    | Digital Output Mask: Positive Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Positive Velocity Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.25h                                                                                                                                                                    | Digital Output Mask: Negative Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Negative Velocity Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.26h                                                                                                                                                                  | Digital Output Mask: Max Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Max Measured Position event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                  |       |               |               |

| 205A.27h                                                                                                                                                                  | Digital Output Mask: Min Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Min Measured Position event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                  |       |               |               |

| 205A.28h                                                                                                                                                             | Digital Output Mask: At Home Position |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the At Home Position event. See <a href="#">Table 2.3</a> above for mapping structure. |                                       |       |               |               |

| 205A.29h                                                                                                                                                                     | Digital Output Mask: Position Following Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Position Following Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.2Ah                                                                                                                                                                      | Digital Output Mask: Max Target position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Max Target Position Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                |       |               |               |

| 205A.2Bh                                                                                                                                                                      | Digital Output Mask: Min Target Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Min Target Position Limit event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                |       |               |               |

| 205A.2Ch                                                                                                                                                                  | Digital Output Mask: Set Measured Position |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Set Measured Position event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.2Dh                                                                                                                                                          | Digital Output Mask: Homing Active |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Homing Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                    |       |               |               |

| 205A.2Eh                                                                                                                                                        | Digital Output Mask: Apply Brake |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Apply Brake event. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.2Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.30h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.31h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.32h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.33h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.34h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205A.35h                                                                                                                                                                | Digital Output Mask: Communication Error |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Communication Error event. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.36h                                                                                                                                                            | Digital Output Mask: Homing Complete |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Homing Complete event. See <a href="#">Table 2.3</a> above for mapping structure. |                                      |       |               |               |

| 205A.37h                                                                                                                                                           | Digital Output Mask: Commanded Stop |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Commanded Stop event. See <a href="#">Table 2.3</a> above for mapping structure. |                                     |       |               |               |



| 205A.38h                                                                                                                                                      | Digital Output Mask: User Stop |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                     | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                    | 0 - $[2^{(16)} - 1]$           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the User Stop event. See <a href="#">Table 2.3</a> above for mapping structure. |                                |       |               |               |

| 205A.39h                                                                                                                                                            | Digital Output Mask: Bridge Enabled |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Bridge Enabled status. See <a href="#">Table 2.3</a> above for mapping structure. |                                     |       |               |               |

| 205A.3Ah                                                                                                                                                                 | Digital Output Mask: Dynamic Brake Active |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Dynamic Brake Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.3Bh                                                                                                                                                        | Digital Output Mask: Stop Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Stop Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.3Ch                                                                                                                                                                 | Digital Output Mask: Positive Stop Active |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Positive Stop Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.3Dh                                                                                                                                                                 | Digital Output Mask: Negative Stop Active |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Negative Stop Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.3Eh                                                                                                                                                                    | Digital Output Mask: Positive Inhibit Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Positive Inhibit Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.3Fh                                                                                                                                                                    | Digital Output Mask: Negative Inhibit Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Negative Inhibit Active event. See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.40h                                                                                                                                             | Digital Output Mask: User Bit 0 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 0. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.41h                                                                                                                                             | Digital Output Mask: User Bit 1 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 1. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.42h                                                                                                                                             | Digital Output Mask: User Bit 2 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 2. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.43h                                                                                                                                             | Digital Output Mask: User Bit 3 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 3. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.44h                                                                                                                                             | Digital Output Mask: User Bit 4 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 4. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.45h                                                                                                                                             | Digital Output Mask: User Bit 5 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 5. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.46h                                                                                                                                             | Digital Output Mask: User Bit 6 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 6. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.47h                                                                                                                                             | Digital Output Mask: User Bit 7 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 7. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.48h                                                                                                                                            | Digital Output Mask: User Bit 8 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                          | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 8 See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.49h                                                                                                                                             | Digital Output Mask: User Bit 9 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 9. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.4Ah                                                                                                                                              | Digital Output Mask: User Bit 10 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 10. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.4Bh                                                                                                                                              | Digital Output Mask: User Bit 11 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 11. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.4Ch                                                                                                                                              | Digital Output Mask: User Bit 12 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 12. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.4Dh                                                                                                                                              | Digital Output Mask: User Bit 13 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 13. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.4Eh                                                                                                                                              | Digital Output Mask: User Bit 14 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 14. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.4Fh                                                                                                                                              | Digital Output Mask: User Bit 15 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - $2^{(16)} - 1$               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to User Bit 15. See <a href="#">Table 2.3</a> above for mapping structure. |                                  |       |               |               |

| 205A.50h                                                                                                                                            | Digital Output Mask: Capture A |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                          | 0 - $[2^{(16)} - 1]$           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Capture A. See <a href="#">Table 2.3</a> above for mapping structure. |                                |       |               |               |

| 205A.51h                                                                                                                                            | Digital Output Mask: Capture B |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                          | 0 - $[2^{(16)} - 1]$           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Capture B. See <a href="#">Table 2.3</a> above for mapping structure. |                                |       |               |               |

| 205A.52h                                                                                                                                                                  | Digital Output Mask: Thermal Monitor Fault |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Thermal Monitor Fault event. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.53h                                                                                                                                                           | Digital Output Mask: Commanded Positive Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Commanded Positive Limit. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.54h                                                                                                                                                           | Digital Output Mask: Commanded Negative Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Commanded Negative Limit. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.55h                                                                                                                                                         | Digital Output Mask: Safe Torque Off Active |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Safe Torque Off Active. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

| 205A.56h                                                                                                                                                      | Digital Output Mask: Zero Position Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                     | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                    | N/A                                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Zero Position Error. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.57h                                                                                                                                                      | Digital Output Mask: Motion Engine Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                     | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                    | 0 - $2^{(16)} - 1$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Motion Engine Error. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.58h                                                                                                                                                       | Digital Output Mask: Motion Engine Active |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $2^{(16)} - 1$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Motion Engine Active. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.59h                                                                                                                                                     | Digital Output Mask: Active Motion Busy |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                   | 0 - $2^{(16)} - 1$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Busy. See <a href="#">Table 2.3</a> above for mapping structure. |                                         |       |               |               |

| 205A.5Ah                                                                                                                                                     | Digital Output Mask: Active Motion Done |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                   | 0 - $2^{(16)} - 1$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Done. See <a href="#">Table 2.3</a> above for mapping structure. |                                         |       |               |               |

| 205A.5Bh                                                                                                                                                      | Digital Output Mask: Active Motion Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                     | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                    | 0 - $2^{(16)} - 1$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Error. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.5Ch                                                                                                                                                       | Digital Output Mask: Active Motion Active |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Active. See <a href="#">Table 2.3</a> above for mapping structure. |                                           |       |               |               |

| 205A.5Dh                                                                                                                                                        | Digital Output Mask: Active Motion Aborted |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Aborted. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.5Eh                                                                                                                                                        | Digital Output Mask: Active Motion Execute |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion Execute. See <a href="#">Table 2.3</a> above for mapping structure. |                                            |       |               |               |

| 205A.5Fh                                                                                                                                                           | Digital Output Mask: Active Motion MotionDone |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion MotionDone. See <a href="#">Table 2.3</a> above for mapping structure. |                                               |       |               |               |

| 205A.60h                                                                                                                                                             | Digital Output Mask: Active Motion SequenceDone |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Active Motion SequenceDone. See <a href="#">Table 2.3</a> above for mapping structure. |                                                 |       |               |               |

| 205A.61h                                                                                                                                                         | Digital Output Mask: Absolute Position Valid |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Absolute Position Valid See <a href="#">Table 2.3</a> above for mapping structure. |                                              |       |               |               |

| 205A.62h                                                                                                                                             | Digital Output Mask: Jog Active |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - $[2^{(16)} - 1]$            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Jog Active. See <a href="#">Table 2.3</a> above for mapping structure. |                                 |       |               |               |

| 205A.63h                                                                                                                                                                | Digital Output Mask: PWM and Direction Broken Wire |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to PWM and Direction Broken Wire. See <a href="#">Table 2.3</a> above for mapping structure. |                                                    |       |               |               |

| 205A.64h                                                                                                                                                                | Digital Output Mask: PLS Pulse 1 Post Active Level Output |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to PLS Pulse 1 Post Active Level. See <a href="#">Table 2.3</a> above for mapping structure. |                                                           |       |               |               |

| 205A.65h                                                                                                                                                                | Digital Output Mask: PLS Pulse 2 Post Active Level Output |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to PLS Pulse 2 Post Active Level. See <a href="#">Table 2.3</a> above for mapping structure. |                                                           |       |               |               |

| 205A.66h                                                                                                                                                      | Digital Output Mask: Motion Engine Abort |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                     | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to Motion Engine Abort. See <a href="#">Table 2.3</a> above for mapping structure. |                                          |       |               |               |

| 205A.67h                                                                                                                                                                        | Digital Output Mask: Sustained Current Indicator |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the Sustained Current Indicator event. See <a href="#">Table 2.3</a> above for mapping structure. |                                                  |       |               |               |



| 205A.68h                                                                                                                                                                   | Digital Output Mask: High Current Indicator |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines which digital outputs, if any, are assigned to the High Current Indicator event. See <a href="#">Table 2.3</a> above for mapping structure. |                                             |       |               |               |

**2044h: Analog Input Configuration** Some deadband parameters have units that vary with the operating mode of the drive. For these parameters, refer to [Table 2.4](#) for the correct unit selection.

**TABLE 2.4 Deadband Units**

| Drive Operation Mode                  | Units  |
|---------------------------------------|--------|
| Current (Torque)                      | DC2    |
| Velocity                              | DS1    |
| Position (Around Velocity Or Current) | counts |

| 2044.01h                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 1 Config 0: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 1 Configuration 0.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.02h                                                                                                                                                                                                                                            | Analog Input 1 Config 0: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 1 Configuration 0 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.03h                                                                                                                                                 | Analog Input 1 Config 0: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 1 Configuration 0 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.04h                                                                                                                | Analog Input 1 Config 0: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 1 Configuration 0 in int32S30 notation. |                                                      |       |               |               |

| 2044.05h                                                                                                                             | Analog Input 1 Config 0: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 1 Configuration 0 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.06h                                                                                                   | Analog Input 1 Config 0: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 1 Configuration 0 in int16S14 notation. |                                         |                               |               |               |

| 2044.07h                                                                                                      | Analog Input 1 Config 0: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 1 Configuration 0 in int16S14 notation. |                                            |                               |               |               |

| 2044.08h                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 1 Config 1: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $2^{(16)}-1$                             | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 1 Configuration 1.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.09h                                                                                                                                                                                                                                            | Analog Input 1 Config 1: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 1 Configuration 1 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.0Ah                                                                                                                                                 | Analog Input 1 Config 1: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 1 Configuration 1 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.0Bh                                                                                                                | Analog Input 1 Config 1: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{31}] - [2^{31}-1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 1 Configuration 1 in int32S30 notation. |                                                      |       |               |               |

| 2044.0Ch                                                                                                                             | Analog Input 1 Config 1: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 1 Configuration 1 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.0Dh                                                                                                   | Analog Input 1 Config 1: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 1 Configuration 1 in int16S14 notation. |                                         |                               |               |               |

| 2044.0Eh                                                                                                      | Analog Input 1 Config 1: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 1 Configuration 1 in int16S14 notation. |                                            |                               |               |               |

| 2044.0Fh                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 2 Config 0: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 2 Configuration 0.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.10h                                                                                                                                                                                                                                            | Analog Input 2 Config 0: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 2 Configuration 0 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.11h                                                                                                                                                 | Analog Input 2 Config 0: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 2 Configuration 0 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.12h                                                                                                                | Analog Input 2 Config 0: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 2 Configuration 0 in int32S30 notation. |                                                      |       |               |               |

| 2044.13h                                                                                                                             | Analog Input 2 Config 0: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 2 Configuration 0 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.14h                                                                                                   | Analog Input 2 Config 0: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 2 Configuration 0 in int16S14 notation. |                                         |                               |               |               |

| 2044.15h                                                                                                      | Analog Input 2 Config 0: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 2 Configuration 0 in int16S14 notation. |                                            |                               |               |               |

| 2044.16h                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 2 Config 1: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 2 Configuration 1.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.17h                                                                                                                                                                                                                                            | Analog Input 2 Config 1: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 2 Configuration 1 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.18h                                                                                                                                                 | Analog Input 2 Config 1: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 2 Configuration 1 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.19h                                                                                                                | Analog Input 2 Config 1: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 2 Configuration 1 in int32S30 notation. |                                                      |       |               |               |

| 2044.1Ah                                                                                                                             | Analog Input 2 Config 1: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 2 Configuration 1 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.1Bh                                                                                                   | Analog Input 2 Config 1: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 2 Configuration 1 in int16S14 notation. |                                         |                               |               |               |

| 2044.1Ch                                                                                                      | Analog Input 2 Config 1: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 2 Configuration 1 in int16S14 notation. |                                            |                               |               |               |

| 2044.1Dh                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 3 Config 0: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 3 Configuration 0.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.1Eh                                                                                                                                                                                                                                            | Analog Input 3 Config 0: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 3 Configuration 0 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.1Fh                                                                                                                                                 | Analog Input 3 Config 0: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 3 Configuration 0 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.20h                                                                                                                | Analog Input 3 Config 0: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 3 Configuration 0 in int32S30 notation. |                                                      |       |               |               |



| 2044.21h                                                                                                                             | Analog Input 3 Config 0: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 3 Configuration 0 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.22h                                                                                                   | Analog Input 3 Config 0: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 3 Configuration 0 in int16S14 notation. |                                         |                               |               |               |

| 2044.23h                                                                                                      | Analog Input 3 Config 0: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 3 Configuration 0 in int16S14 notation. |                                            |                               |               |               |

| 2044.24h                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 3 Config 1: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $2^{(16)} - 1$                           | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 3 Configuration 1.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.25h                                                                                                                             | Analog Input 3 Config 1: Input Boundaries |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|--|--|
| Data Type                                                                                                                            | Data Range                                | Units                                                                                                                                                                                                                                               | Accessibility | Stored to NVM |   |                   |   |                     |   |                     |   |                   |  |  |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A                                                                                                                                                                                                                                                 | Read / Write  | Yes           |   |                   |   |                     |   |                     |   |                   |  |  |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 3 Configuration 1 in int16S14 notation. |                                           |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
|                                                                                                                                      |                                           | <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> | Offset        | Description   | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |  |  |
| Offset                                                                                                                               | Description                               |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
| 0                                                                                                                                    | Upper Input Limit                         |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
| 1                                                                                                                                    | Upper Input Warning                       |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
| 2                                                                                                                                    | Lower Input Warning                       |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |
| 3                                                                                                                                    | Lower Input Limit                         |                                                                                                                                                                                                                                                     |               |               |   |                   |   |                     |   |                     |   |                   |  |  |

| 2044.26h                                                                                                                                                 | Analog Input 3 Config 1: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 3 Configuration 1 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.27h                                                                                                                | Analog Input 3 Config 1: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 3 Configuration 1 in int32S30 notation. |                                                      |       |               |               |

| 2044.28h                                                                                                                             | Analog Input 3 Config 1: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 3 Configuration 1 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.29h                                                                                                   | Analog Input 3 Config 1: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 3 Configuration 1 in int16S14 notation. |                                         |                               |               |               |

| 2044.2Ah                                                                                                      | Analog Input 3 Config 1: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 3 Configuration 1 in int16S14 notation. |                                            |                               |               |               |

| 2044.2Bh                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 4 Config 0: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - [2 <sup>(16)</sup> -1]                   | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 4 Configuration 0.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.2Ch                                                                                                                                                                                                                                            | Analog Input 4 Config 0: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 4 Configuration 0 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.2Dh                                                                                                                                                 | Analog Input 4 Config 0: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 4 Configuration 0 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.2Eh                                                                                                                | Analog Input 4 Config 0: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 4 Configuration 0 in int32S30 notation. |                                                      |       |               |               |

| 2044.2Fh                                                                                                                             | Analog Input 4 Config 0: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 4 Configuration 0 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.30h                                                                                                   | Analog Input 4 Config 0: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 4 Configuration 0 in int16S14 notation. |                                         |                               |               |               |

| 2044.31h                                                                                                      | Analog Input 4 Config 0: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 4 Configuration 0 in int16S14 notation. |                                            |                               |               |               |

| 2044.32h                                                                                                                                                                                                                                                                                                                                                                          | Analog Input 4 Config 1: Configuration       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|--------|-------------|---|------------------------------------------|---|----------------------------------------------|---|----------------------------------------|-----|-------------------------|------|----------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                   | Units | Accessibility | Stored to NVM |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                        | 0 - $2^{(16)} - 1$                           | N/A   | Read / Write  | Yes           |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 4 Configuration 1.                                                                                                                                                                                                                                                                                   |                                              |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| <table><tr><th>Bit(s)</th><th>Description</th></tr><tr><td>0</td><td>Invert Input; 0=Non-inverted; 1=Inverted</td></tr><tr><td>1</td><td>Enable Input Warnings; 0=Disabled; 1=Enabled</td></tr><tr><td>2</td><td>Enable Deadband; 0=Disabled; 1=Enabled</td></tr><tr><td>3-6</td><td>Output Left Shift: 0-15</td></tr><tr><td>7-15</td><td>Reserved (must be 0)</td></tr></table> |                                              |       |               |               | Bit(s) | Description | 0 | Invert Input; 0=Non-inverted; 1=Inverted | 1 | Enable Input Warnings; 0=Disabled; 1=Enabled | 2 | Enable Deadband; 0=Disabled; 1=Enabled | 3-6 | Output Left Shift: 0-15 | 7-15 | Reserved (must be 0) |
| Bit(s)                                                                                                                                                                                                                                                                                                                                                                            | Description                                  |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 0                                                                                                                                                                                                                                                                                                                                                                                 | Invert Input; 0=Non-inverted; 1=Inverted     |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 1                                                                                                                                                                                                                                                                                                                                                                                 | Enable Input Warnings; 0=Disabled; 1=Enabled |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 2                                                                                                                                                                                                                                                                                                                                                                                 | Enable Deadband; 0=Disabled; 1=Enabled       |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 3-6                                                                                                                                                                                                                                                                                                                                                                               | Output Left Shift: 0-15                      |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |
| 7-15                                                                                                                                                                                                                                                                                                                                                                              | Reserved (must be 0)                         |       |               |               |        |             |   |                                          |   |                                              |   |                                        |     |                         |      |                      |

| 2044.33h                                                                                                                                                                                                                                            | Analog Input 4 Config 1: Input Boundaries |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|--------|-------------|---|-------------------|---|---------------------|---|---------------------|---|-------------------|
| Data Type                                                                                                                                                                                                                                           | Data Range                                | Units | Accessibility | Stored to NVM |        |             |   |                   |   |                     |   |                     |   |                   |
| Integer16                                                                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)} - 1]$            | N/A   | Read / Write  | Yes           |        |             |   |                   |   |                     |   |                     |   |                   |
| <b>Description:</b><br>Contains the four Input Limits and Warning Boundaries of Analog Input 4 Configuration 1 in int16S14 notation.                                                                                                                |                                           |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| <table><tr><th>Offset</th><th>Description</th></tr><tr><td>0</td><td>Upper Input Limit</td></tr><tr><td>1</td><td>Upper Input Warning</td></tr><tr><td>2</td><td>Lower Input Warning</td></tr><tr><td>3</td><td>Lower Input Limit</td></tr></table> |                                           |       |               |               | Offset | Description | 0 | Upper Input Limit | 1 | Upper Input Warning | 2 | Lower Input Warning | 3 | Lower Input Limit |
| Offset                                                                                                                                                                                                                                              | Description                               |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 0                                                                                                                                                                                                                                                   | Upper Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 1                                                                                                                                                                                                                                                   | Upper Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 2                                                                                                                                                                                                                                                   | Lower Input Warning                       |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |
| 3                                                                                                                                                                                                                                                   | Lower Input Limit                         |       |               |               |        |             |   |                   |   |                     |   |                     |   |                   |

| 2044.34h                                                                                                                                                 | Analog Input 4 Config 1: Output Boundaries |       |               |               |         |             |   |                    |   |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|---------|-------------|---|--------------------|---|--------------------|
| Data Type                                                                                                                                                | Data Range                                 | Units | Accessibility | Stored to NVM |         |             |   |                    |   |                    |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$             | N/A   | Read / Write  | Yes           |         |             |   |                    |   |                    |
| <b>Description:</b><br>Contains the two Output Boundaries of Analog Input 4 Configuration 1 in int32S20 notation.                                        |                                            |       |               |               |         |             |   |                    |   |                    |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Upper Output Limit</td></tr><tr><td>1</td><td>Lower Output Limit</td></tr></table> |                                            |       |               |               | Element | Description | 0 | Upper Output Limit | 1 | Lower Output Limit |
| Element                                                                                                                                                  | Description                                |       |               |               |         |             |   |                    |   |                    |
| 0                                                                                                                                                        | Upper Output Limit                         |       |               |               |         |             |   |                    |   |                    |
| 1                                                                                                                                                        | Lower Output Limit                         |       |               |               |         |             |   |                    |   |                    |

| 2044.35h                                                                                                                | Analog Input 4 Config 1: Low Pass Filter Coefficient |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range                                           | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                               | $[-2^{31}] - [2^{31}-1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Low Pass Filter Coefficient of Analog Input 4 Configuration 1 in int32S30 notation. |                                                      |       |               |               |

| 2044.36h                                                                                                                             | Analog Input 4 Config 1: Deadband Configuration |                               |               |               |         |             |   |            |   |        |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------|---------------|---------------|---------|-------------|---|------------|---|--------|
| Data Type                                                                                                                            | Data Range                                      | Units                         | Accessibility | Stored to NVM |         |             |   |            |   |        |
| Integer16                                                                                                                            | $[-2^{(15)}] - [2^{(15)} - 1]$                  | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |         |             |   |            |   |        |
| <b>Description:</b><br>Contains the configuration parameters of Analog Input 4 Configuration 1 Deadband.                             |                                                 |                               |               |               |         |             |   |            |   |        |
| <table><tr><th>Element</th><th>Description</th></tr><tr><td>0</td><td>Non-Linear</td></tr><tr><td>1</td><td>Linear</td></tr></table> |                                                 |                               |               |               | Element | Description | 0 | Non-Linear | 1 | Linear |
| Element                                                                                                                              | Description                                     |                               |               |               |         |             |   |            |   |        |
| 0                                                                                                                                    | Non-Linear                                      |                               |               |               |         |             |   |            |   |        |
| 1                                                                                                                                    | Linear                                          |                               |               |               |         |             |   |            |   |        |

| 2044.37h                                                                                                   | Analog Input 4 Config 1: Deadband Width |                               |               |               |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                  | Data Range                              | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                  | $[-2^{(15)}] - [2^{(15)} - 1]$          | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Width of Analog Input 4 Configuration 1 in int16S14 notation. |                                         |                               |               |               |

| 2044.38h                                                                                                      | Analog Input 4 Config 1: Deadband Setpoint |                               |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                 | Units                         | Accessibility | Stored to NVM |
| Integer16                                                                                                     | $[-2^{(15)}] - [2^{(15)} - 1]$             | See <a href="#">Table 2.4</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Contains the Deadband Setpoint of Analog Input 4 Configuration 1 in int16S14 notation. |                                            |                               |               |               |

**2040h: Programmable Limit Switch Parameters** The Programmable Limit Switch Parameters contains tables for the Configuration Control in [Table 2.5](#) and the Pulse Generator Configurations (#1 and #2) in [Table 2.6](#).

| 2040.01h                                                                 |              | Programmable Limit Switch Structure |                                                                                                                                                                                                          |               |
|--------------------------------------------------------------------------|--------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Data Type                                                                | Data Range   | Units                               | Accessibility                                                                                                                                                                                            | Stored to NVM |
| See Table                                                                | N/A          | N/A                                 | Read / Write                                                                                                                                                                                             | No            |
| <b>Description:</b><br>Configures all the parameters for the PLS module. |              |                                     |                                                                                                                                                                                                          |               |
| Word #                                                                   | Data Type    | Name                                | Description                                                                                                                                                                                              |               |
| 0                                                                        | Structure    | Configuration Control               | Configures the behavior of the PLS module. Allows host to select the input source signal and to select linear or rotary mode. See <a href="#">Table 2.5</a> .                                            |               |
| 1                                                                        | Integer      | Roll-over count                     | The rotary roll-over value used. Default is 20,000                                                                                                                                                       |               |
| 2                                                                        |              |                                     |                                                                                                                                                                                                          |               |
| 3                                                                        | Structure    | Pulse Generator #1 Configuration    | Configuration for pulse generator #1. See <a href="#">Table 2.6</a> .                                                                                                                                    |               |
| 4                                                                        | Integer      | Pulse Gen. #1 Lower Position        | Lower position count for Pulse Gen. Default is 1,000.                                                                                                                                                    |               |
| 5                                                                        |              |                                     |                                                                                                                                                                                                          |               |
| 6                                                                        | Integer      | Pulse Gen. #1 Upper Position        | Upper position count for Pulse Gen. Default is 1750. Upper Position ≥ Lower Position                                                                                                                     |               |
| 7                                                                        |              |                                     |                                                                                                                                                                                                          |               |
| 8                                                                        | Integer      | Pulse Gen. #1 Repeat Size           | Specifies the number of counts between repeating pulses. Default: 2,000                                                                                                                                  |               |
| 9                                                                        |              |                                     |                                                                                                                                                                                                          |               |
| 10                                                                       | Unsigned int | Pulse Gen. #1 Pulse Width (time)    | Only used in Time Base mode: This specifies the width of the triggered pulse in terms of the number of position loop samples (2Ts). Must be greater than 0. Default: 16. See <a href="#">Table 2.5</a> . |               |
| 11                                                                       | Structure    | Pulse Generator #2 Configuration    | Configuration for pulse generator #2. See <a href="#">Table 2.6</a> .                                                                                                                                    |               |
| 12                                                                       | Integer      | Pulse Gen. #2 Lower Position        | Lower position count for Pulse Gen. Default is 2,000.                                                                                                                                                    |               |
| 13                                                                       |              |                                     |                                                                                                                                                                                                          |               |
| 14                                                                       | Integer      | Pulse Gen. #2 Upper Position        | Upper position count for Pulse Gen. Default is 2,500. Upper Position ≥ Lower Position                                                                                                                    |               |
| 15                                                                       |              |                                     |                                                                                                                                                                                                          |               |
| 16                                                                       | Integer      | Pulse Gen. #2 Repeat distance       | Specifies the number of counts between repeating pulses. Default: 2,000                                                                                                                                  |               |
| 17                                                                       |              |                                     |                                                                                                                                                                                                          |               |
| 18                                                                       | Unsigned int | Pulse Gen. #2 Pulse Width (time)    | Only used in Time Base mode: This specifies the width of the triggered pulse in terms of the number of position loop samples (2Ts). Must be greater than 0. Default: 16                                  |               |

**TABLE 2.5 Configuration Control**

| Bits   | Name                      | Description                                               |
|--------|---------------------------|-----------------------------------------------------------|
| [3:0]  | PLS Source Enum           | Valid Values:<br>0: No source, (Master Disable) (default) |
| [14:4] | Reserved                  | Valid Values: 0                                           |
| [15]   | Linear/Rotary Mode Select | 0: Rotary Mode (default)<br>1: Linear Mode                |

**TABLE 2.6 Pulse Generator Configurations (#1 and #2)**

| Bits   | Name                         | Description                                                                                                                                      |
|--------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| [0]    | Pulse #1 Generator Enable    | 0: Pulse Generator is disabled, (default)<br>1: Pulse Generator is enabled                                                                       |
| [1]    | Pulse #1 Output Active Level | 0: Active Hi (default)<br>1: Active Lo                                                                                                           |
| [2]    | Pulse #1 Repeat Control      | 0: Pulse repeat count enabled (the value of the repeat counter will be used) (default)<br>1: Pulse repeat count disabled (infinite repeat count) |
| [3]    | Pulse #1 Pulse Width Control | 0: Pulse width is based on position counts (default)<br>1: Pulse width is based on time                                                          |
| [4:5]  | Pulse #1 Direction Control   | Valid Values:<br>0: Level sensitive/Both directions (default)<br>1: Rising Edge-Forward<br>2: Rising Edge-Reverse                                |
| [6:7]  | Reserved                     | Valid Values: 0                                                                                                                                  |
| [8:15] | Pulse #1 Repeat Count        | Valid Values: $0 \leq \text{RepeatCount} < 256$<br>Total number of pulses in the pulse train = 1+Repeat Count (default = 0)                      |

**203Bh: Biquad Filter Configuration Parameters**

| 203B.01h                                                                                                                                                                                                                                                   | Biquad Filter 1 Configuration Parameters |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|------|-------------|-----|---|-----|----|-----|----|-----|----|-----|----|-------|----|
| Data Type                                                                                                                                                                                                                                                  | Data Range                               | Units | Accessibility | Stored to NVM |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| Structure                                                                                                                                                                                                                                                  | N/A                                      | N/A   | Read / Write  | Yes           |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| <b>Description:</b><br>12-word structure containing the filter coefficients for Biquad Filter 1.                                                                                                                                                           |                                          |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| <table><tr><th>Word</th><th>Coefficient</th></tr><tr><td>0-1</td><td>K</td></tr><tr><td>2-3</td><td>A1</td></tr><tr><td>4-5</td><td>A2</td></tr><tr><td>6-7</td><td>B0</td></tr><tr><td>8-9</td><td>B1</td></tr><tr><td>10-11</td><td>B2</td></tr></table> |                                          |       |               |               | Word | Coefficient | 0-1 | K | 2-3 | A1 | 4-5 | A2 | 6-7 | B0 | 8-9 | B1 | 10-11 | B2 |
| Word                                                                                                                                                                                                                                                       | Coefficient                              |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 0-1                                                                                                                                                                                                                                                        | K                                        |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 2-3                                                                                                                                                                                                                                                        | A1                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 4-5                                                                                                                                                                                                                                                        | A2                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 6-7                                                                                                                                                                                                                                                        | B0                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 8-9                                                                                                                                                                                                                                                        | B1                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 10-11                                                                                                                                                                                                                                                      | B2                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |



| 203B.02h                                                                                                                                                                                                                                                   | Biquad Filter 2 Configuration Parameters |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|------|-------------|-----|---|-----|----|-----|----|-----|----|-----|----|-------|----|
| Data Type                                                                                                                                                                                                                                                  | Data Range                               | Units | Accessibility | Stored to NVM |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| Structure                                                                                                                                                                                                                                                  | N/A                                      | N/A   | Read / Write  | Yes           |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| <b>Description:</b><br>12-word structure containing the filter coefficients for Biquad Filter 2.                                                                                                                                                           |                                          |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| <table><tr><th>Word</th><th>Coefficient</th></tr><tr><td>0-1</td><td>K</td></tr><tr><td>2-3</td><td>A1</td></tr><tr><td>4-5</td><td>A2</td></tr><tr><td>6-7</td><td>B0</td></tr><tr><td>8-9</td><td>B1</td></tr><tr><td>10-11</td><td>B2</td></tr></table> |                                          |       |               |               | Word | Coefficient | 0-1 | K | 2-3 | A1 | 4-5 | A2 | 6-7 | B0 | 8-9 | B1 | 10-11 | B2 |
| Word                                                                                                                                                                                                                                                       | Coefficient                              |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 0-1                                                                                                                                                                                                                                                        | K                                        |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 2-3                                                                                                                                                                                                                                                        | A1                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 4-5                                                                                                                                                                                                                                                        | A2                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 6-7                                                                                                                                                                                                                                                        | B0                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 8-9                                                                                                                                                                                                                                                        | B1                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |
| 10-11                                                                                                                                                                                                                                                      | B2                                       |       |               |               |      |             |     |   |     |    |     |    |     |    |     |    |       |    |

**203Dh: Deadband Parameters** Some deadband parameters have units that vary with the operating mode of the drive. For these parameters, refer to [Table 2.7](#) for the correct unit selection.

**TABLE 2.7** Deadband Units

| Drive Operation Mode                  | Units  |
|---------------------------------------|--------|
| Current (Torque)                      | DC2    |
| Velocity                              | DS1    |
| Position (Around Velocity Or Current) | counts |

| 203D.01h                                                                                                                                                                                                                              | Deadband Type: Config 0                                     |       |               |               |       |             |   |                                                             |   |                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|---------------|---------------|-------|-------------|---|-------------------------------------------------------------|---|----------------------------------------------------------|
| Data Type                                                                                                                                                                                                                             | Data Range                                                  | Units | Accessibility | Stored to NVM |       |             |   |                                                             |   |                                                          |
| Integer16                                                                                                                                                                                                                             | 0 - 1                                                       | N/A   | Read / Write  | Yes           |       |             |   |                                                             |   |                                                          |
| <b>Description:</b><br>Deadband Type for Configuration 0.                                                                                                                                                                             |                                                             |       |               |               |       |             |   |                                                             |   |                                                          |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Non-linear (starts smoothly after reaching end of deadband)</td></tr><tr><td>1</td><td>Linear (jumps to command after reaching end of deadband)</td></tr></table> |                                                             |       |               |               | Value | Description | 0 | Non-linear (starts smoothly after reaching end of deadband) | 1 | Linear (jumps to command after reaching end of deadband) |
| Value                                                                                                                                                                                                                                 | Description                                                 |       |               |               |       |             |   |                                                             |   |                                                          |
| 0                                                                                                                                                                                                                                     | Non-linear (starts smoothly after reaching end of deadband) |       |               |               |       |             |   |                                                             |   |                                                          |
| 1                                                                                                                                                                                                                                     | Linear (jumps to command after reaching end of deadband)    |       |               |               |       |             |   |                                                             |   |                                                          |

| 203D.02h                                                                                                                                       | Deadband Width: Config 0 |                               |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                      | Data Range               | Units                         | Accessibility | Stored to NVM |
| Integer32                                                                                                                                      | 0 – $2^{(31)}-1$         | See <a href="#">Table 2.7</a> | Read / Write  | Yes           |
| <b>Description:</b><br>The width from the midpoint to one end of the deadband in Configuration 0. Therefore, the total width is 2X this value. |                          |                               |               |               |

| 203D.03h                                                            | Deadband Set Point: Config 0 |                               |               |               |
|---------------------------------------------------------------------|------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                           | Data Range                   | Units                         | Accessibility | Stored to NVM |
| Integer32                                                           | $[-2^{(31)}] - [2^{(31)}-1]$ | See <a href="#">Table 2.7</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Midpoint of the Deadband in Configuration 0. |                              |                               |               |               |

| 203D.04h                                                                                                                                                                                                                              | Deadband Type: Config 1                                     |       |               |               |       |             |   |                                                             |   |                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|---------------|---------------|-------|-------------|---|-------------------------------------------------------------|---|----------------------------------------------------------|
| Data Type                                                                                                                                                                                                                             | Data Range                                                  | Units | Accessibility | Stored to NVM |       |             |   |                                                             |   |                                                          |
| Integer16                                                                                                                                                                                                                             | 0 - 1                                                       | N/A   | Read / Write  | Yes           |       |             |   |                                                             |   |                                                          |
| <b>Description:</b><br>Deadband Type for Configuration 1.                                                                                                                                                                             |                                                             |       |               |               |       |             |   |                                                             |   |                                                          |
| <table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Non-linear (starts smoothly after reaching end of deadband)</td></tr><tr><td>1</td><td>Linear (jumps to command after reaching end of deadband)</td></tr></table> |                                                             |       |               |               | Value | Description | 0 | Non-linear (starts smoothly after reaching end of deadband) | 1 | Linear (jumps to command after reaching end of deadband) |
| Value                                                                                                                                                                                                                                 | Description                                                 |       |               |               |       |             |   |                                                             |   |                                                          |
| 0                                                                                                                                                                                                                                     | Non-linear (starts smoothly after reaching end of deadband) |       |               |               |       |             |   |                                                             |   |                                                          |
| 1                                                                                                                                                                                                                                     | Linear (jumps to command after reaching end of deadband)    |       |               |               |       |             |   |                                                             |   |                                                          |

| 203D.05h                                                                                                                                       | Deadband Width: Config 1 |                               |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------|---------------|---------------|
| Data Type                                                                                                                                      | Data Range               | Units                         | Accessibility | Stored to NVM |
| Integer32                                                                                                                                      | $0 - [2^{(31)}-1]$       | See <a href="#">Table 2.7</a> | Read / Write  | Yes           |
| <b>Description:</b><br>The width from the midpoint to one end of the deadband in Configuration 1. Therefore, the total width is 2X this value. |                          |                               |               |               |

| 203D.06h                                                            | Deadband Set Point: Config 1 |                               |               |               |
|---------------------------------------------------------------------|------------------------------|-------------------------------|---------------|---------------|
| Data Type                                                           | Data Range                   | Units                         | Accessibility | Stored to NVM |
| Integer32                                                           | $[-2^{(31)}] - [2^{(31)}-1]$ | See <a href="#">Table 2.7</a> | Read / Write  | Yes           |
| <b>Description:</b><br>Midpoint of the Deadband in Configuration 1. |                              |                               |               |               |

## 2253h: Jogging

| 2253.01h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2253.02h                                                                   | Max Acceleration     |       |               |               |
|----------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                  | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                                                  | $1 - [2^{(31)} - 1]$ | DA4   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the maximum acceleration for the selected Jog. |                      |       |               |               |

| 2253.03h                                                                   | Max Deceleration     |       |               |               |
|----------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                  | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                                                  | $1 - [2^{(31)} - 1]$ | DA4   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the maximum deceleration for the selected Jog. |                      |       |               |               |

| 2253.04h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2253.05h                                                | Jog Speed 0          |       |               |               |
|---------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                               | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                               | $1 - [2^{(31)} - 1]$ | DS1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the target speed for Jog 0. |                      |       |               |               |

| 2253.06h                                                | Jog Speed 1          |       |               |               |
|---------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                               | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                               | $1 - [2^{(31)} - 1]$ | DS1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the target speed for Jog 1. |                      |       |               |               |

| 2253.07h                                                | Jog Speed 2          |       |               |               |
|---------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                               | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                               | $1 - [2^{(31)} - 1]$ | DS1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the target speed for Jog 2. |                      |       |               |               |

| 2253.08h                                                | Jog Speed 3          |       |               |               |
|---------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                               | Data Range           | Units | Accessibility | Stored to NVM |
| Integer32                                               | $1 - [2^{(31)} - 1]$ | DS1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the target speed for Jog 3. |                      |       |               |               |

| 2253.09h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2253.0Ah  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2253.0Bh  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

| 2253.0Ch  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| -         | -          | -     | -             | -             |

### 2062h: Braking/Stop General Properties

| 2062.01h                                                                                                                                             | Braking: Delay After Applying Brake |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                          | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | $0 - [2^{(16)} - 1]$                | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies the delay, in milliseconds, after applying the external brake before disabling the power bridge or dynamic braking. |                                     |                   |               |               |

| 2062.02h                                                                                                                                                           | Braking: Delay Before Disengaging Brake |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies the delay, in milliseconds, before releasing the external brake after enabling the power bridge or discontinuing dynamic braking. |                                         |                   |               |               |

| 2062.03h                                                                                                                                                                        | Stop Deceleration Limit - Position Mode |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                              | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                       | 1 - $[2^{(31)} - 1]$                    | DA1   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies the maximum position mode deceleration during a controlled Stop event. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                         |       |               |               |

| 2062.04h                                                                                                                                                                        | Stop Deceleration Limit - Velocity Mode |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                              | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                       | 1 - $[2^{(31)} - 1]$                    | DA1   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies the maximum velocity mode acceleration during a controlled Stop event. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                         |       |               |               |

| 2062.05h                                                                                                                                                                                              | Stop Jerk Limit - Current Mode |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                             | Data Range                     | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                             | 1 - $[2^{(31)} - 1]$           | DJ1   | Read / Write  | Yes           |
| <b>Description:</b><br>Sets the rate at which the target current ramps down during a Stop event. Only valid for current mode. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                |       |               |               |

### 2064h: Event Response Time Parameters

| 2064.01h                                                                                                                                                                                   | Event Response Time: Motor Over Temperature |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 - $[2^{(15)} - 1]$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Motor Over Temperature before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                             |                   |               |               |

| 2064.02h                                                                                                                                                                                    | Event Response Time: Feedback Sensor Error |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{(15)} - 1$                         | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a Feedback Sensor Error before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                            |                   |               |               |

| 2064.03h                                                                                                                                                                               | Event Response Time: Log Entry Missed |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – $2^{(15)} - 1$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a Log Entry Missed before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                       |                   |               |               |

| 2064.04h                                                                                                                                                                   | Event Response Time: User Disable |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                        | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 – $2^{(15)} - 1$                | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a User Disable before the power bridge is disabled.<br>The event action is disabled when bit 15 is set to 1. |                                   |                   |               |               |

| 2064.05h                                                                                                                                                                                        | Event Response Time: User Positive Limit |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                       | Data Range                               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                      | 0 – $2^{(15)} - 1$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a User Positive Limit input before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                          |                   |               |               |

| 2064.06h                                                                                                                                                                                        | Event Response Time: User Negative Limit |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                       | Data Range                               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                      | 0 – $2^{(15)} - 1$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a User Negative Limit input before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                          |                   |               |               |

| 2064.07h                                                                                                                        | Event Response Time: Current Limit Active |              |               |               |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------|---------------|---------------|
| Data Type                                                                                                                       | Data Range                                | Units        | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                      | 0 – $2^{(15)} - 1$                        | Milliseconds | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Current Limit Active before its Event Action (2065h) is executed. |                                           |              |               |               |

| 2064.08h                                                                                                                                                                                                             | Event Response Time: Continuous Current Foldback |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                            | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                           | 0 – $2^{(15)} - 1$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of reaching the Continuous Current Foldback setting before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                  |                   |               |               |

| 2064.09h                                                                                                                                                                                    | Event Response Time: Current Limit Saturated |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{(15)} - 1$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Current Limit Saturated before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                              |                   |               |               |

| 2064.0Ah                                                                                                                                                                               | Event Response Time: User Under Voltage |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – $2^{(15)} - 1$                      | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of User Under Voltage before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                         |                   |               |               |

| 2064.0Bh                                                                                                                                                                                                | Event Response Time: User Over Voltage |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                               | Data Range                             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                              | 0 – $2^{(15)} - 1$                     | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a user-specified Over Voltage level before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                        |                   |               |               |

| 2064.0Ch                                                                                                                                                                             | Event Response Time: Motor Over Speed |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                           | 0 – $2^{(15)} - 1$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Motor Over Speed before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                       |                   |               |               |

| 2064.0Dh                                                                                                                                                                                 | Event Response Time: User Auxiliary Disable |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0 – $2^{(15)} - 1$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a User Auxiliary Disable input before dynamic braking is applied.<br>The event action is disabled when bit 15 is set to 1. |                                             |                   |               |               |

| 2064.0Eh                                                                                                                                                                                     | Event Response Time: Shunt Regulator |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                           | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – $2^{(15)} - 1$                   | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Shunt Regulator activity before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                      |                   |               |               |

| 2064.0Fh                                                                                                                                                                                   | Event Response Time: Command Limiter Active |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – $2^{(15)} - 1$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Command Limiter Active before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                             |                   |               |               |

| 2064.10h                                                                                                                                                                                     | Event Response Time: Velocity Following Error |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – $2^{(15)} - 1$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Velocity Following Error before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                               |                   |               |               |



| 2064.11h                                                                                                                                                                                    | Event Response Time: Positive Velocity Limit |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{(15)} - 1$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Positive Velocity Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                              |                   |               |               |

| 2064.12h                                                                                                                                                                                    | Event Response Time: Negative Velocity Limit |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – $2^{(15)} - 1$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Negative Velocity Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                              |                   |               |               |

| 2064.13h                                                                                                                                                                             | Event Response Time: At Home Position |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                           | 0 – $2^{(15)} - 1$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of At Home Position before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                       |                   |               |               |

| 2064.14h                                                                                                                                                                                     | Event Response Time: Position Following Error |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – $2^{(15)} - 1$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Position Following Error before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                               |                   |               |               |

| 2064.15h                                                                                                                                                                                      | Event Response Time: Max Target Position Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – $2^{(15)} - 1$                             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Max Target Position Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                |                   |               |               |

| 2064.16h                                                                                                                                                                                      | Event Response Time: Min Target Position Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – $2^{(15)} - 1$                             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Min Target Position Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                |                   |               |               |

| 2064.17h                                                                                                                                                                                            | Event Response Time: Max Measured Position Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                           | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                          | 0 – $2^{(15)} - 1$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Maximum Measured Position Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                  |                   |               |               |

| 2064.18h                                                                                                                                                                                            | Event Response Time: Min Measured Position Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                           | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                          | 0 – $2^{(15)} - 1$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Minimum Measured Position Limit before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                  |                   |               |               |

| 2064.19h                                                                                                                                                                            | Event Response Time: PVT Buffer Full |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                           | Data Range                           | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                          | 0 – $2^{(15)} - 1$                   | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Buffer Full before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                      |                   |               |               |

| 2064.1Ah                                                                                                                                                                             | Event Response Time: PVT Buffer Empty |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                           | 0 – $2^{(15)} - 1$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Buffer Empty before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                       |                   |               |               |

| 2064.1Bh                                                                                                                                                                                       | Event Response Time: PVT Buffer Under Threshold |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                                      | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                     | 0 – $2^{(15)} - 1$                              | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Buffer Under Threshold before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                 |                   |               |               |

| 2064.1Ch                                                                                                                                                                               | Event Response Time: PVT Buffer Failure |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – $2^{(15)} - 1$                      | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Buffer Failure before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                         |                   |               |               |

| 2064.1Dh                                                                                                                                                                                  | Event Response Time: PVT Buffer Empty Stop |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | 0 – $2^{(15)} - 1$                         | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Buffer Empty Stop before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                            |                   |               |               |

| 2064.1Eh                                                                                                                                                                               | Event Response Time: PVT Sequence Error |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – $2^{(15)} - 1$                      | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PVT Sequence Error before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                         |                   |               |               |

| 2064.1Fh                                                                                                                                                                                | Event Response Time: Communication Error |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                               | Data Range                               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                              | 0 – $2^{(15)} - 1$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of Communication Error before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                          |                   |               |               |

| 2064.20h                                                                                                                                                              | Event Response Time: User Stop |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 – $2^{(15)} - 1$             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of a User Stop command before stopping the motor.<br>The event action is disabled when bit 15 is set to 1. |                                |                   |               |               |

| 2064.21h                                                                                                                                                                                          | Event Response Time: PWM and Direction Broken Wire |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                         | Data Range                                         | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                        | 0 – $2^{(15)} - 1$                                 | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of PWM and Direction Broken Wire before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                                    |                   |               |               |

| 2064.22h                                                                                                                                                                                   | Event Response Time: High Current Indicator |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – $2^{(15)} - 1$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after the occurrence of High Current Indicator before its Event Action (2065h) is executed.<br>The event action is disabled when bit 15 is set to 1. |                                             |                   |               |               |

## 2065h: Event Action Parameters

| 2065.01h                                                                                                                                                                                      | Event Action: Parameter Restore Error |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – 15                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Parameter Restore Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                       |       |               |               |

| 2065.02h                                                                                                                                                                                    | Event Action: Parameter Store Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – 15                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Parameter Store Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                     |       |               |               |

| 2065.03h                                                                                                                                                                                  | Event Action: Invalid Hall State |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | 0 – 15                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after an Invalid Hall State. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                  |       |               |               |

| 2065.04h                                                                                                                                                                                | Event Action: Phase Synch Error |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                               | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                              | 0 – 15                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Phase Synch Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                 |       |               |               |

| 2065.05h                                                                                                                                                                                     | Event Action: Motor Over Temperature |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Motor Over Temperature. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.06h                                                                                                                                                                                    | Event Action: Feedback Sensor Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – 15                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Feedback Sensor Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                     |       |               |               |

| 2065.07h                                                                                                                                                                               | Event Action: Log Entry Missed |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – 15                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Log Entry Missed. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                |       |               |               |

| 2065.08h                                                                                                                                                                               | Event Action: Current Limiting |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – 15                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Current Limiting. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                |       |               |               |

| 2065.09h                                                                                                                                                                                 | Event Action: Continuous Current |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0 – 15                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Continuous Current. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                  |       |               |               |

| 2065.0Ah                                                                                                                                                                                   | Event Action: Current Loop Saturated |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after Current Loop Saturated. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.0Bh                                                                                                                                                                                 | Event Action: User Under Voltage |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0 – 15                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Under Voltage. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                  |       |               |               |

| 2065.0Ch                                                                                                                                                                                | Event Action: User Over Voltage |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                               | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                              | 0 – 15                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Over Voltage. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                 |       |               |               |

| 2065.0Dh                                                                                                                                                                                   | Event Action: Shunt Regulator |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – 15                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after Shunt Regulator active. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                               |       |               |               |

| 2065.0Eh                                                                                                                                                                                   | Event Action: Command Limiter Active |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after Command Limiter Active. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.0Fh                                                                                                                                                                               | Event Action: Motor Over Speed |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – 15                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Motor Over Speed. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                |       |               |               |

| 2065.10h                                                                                                                                                                                | Event Action: At Command |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                               | Data Range               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                              | 0 – 15                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after an At Command state. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                          |       |               |               |

| 2065.11h                                                                                                                                                                                  | Event Action: Zero Velocity |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | 0 – 15                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Zero Velocity state. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                             |       |               |               |

| 2065.12h                                                                                                                                                                                       | Event Action: Velocity Following Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                     | 0 – 15                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Velocity Following Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                        |       |               |               |

| 2065.13h                                                                                                                                                                                      | Event Action: Positive Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – 15                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Positive Velocity Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                       |       |               |               |

| 2065.14h                                                                                                                                                                                      | Event Action: Negative Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – 15                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Negative Velocity Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                       |       |               |               |

| 2065.15h                                                                                                                                                                                          | Event Action: Max Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                         | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                        | 0 – 15                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Max Measured Position Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                           |       |               |               |

| 2065.16h                                                                                                                                                                                          | Event Action: Min Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                         | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                        | 0 – 15                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Min Measured Position Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                           |       |               |               |



| 2065.17h                                                                                                                                                                                      | Event Action: At Home Position |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                    | 0 – 15                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after an At Home Position state. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                |       |               |               |

| 2065.18h                                                                                                                                                                                       | Event Action: Position Following Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                     | 0 – 15                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Position Following Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                        |       |               |               |

| 2065.19h                                                                                                                                                                                        | Event Action: Max Target Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                       | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                      | 0 – 15                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Max Target Position Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                         |       |               |               |

| 2065.1Ah                                                                                                                                                                                        | Event Action: Min Target Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                       | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                      | 0 – 15                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Min Target Position Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                         |       |               |               |

| 2065.1Bh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.1Ch   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.1Dh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.1Eh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.1Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.20h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2065.21h                                                                                                                                                                                 | Event Action: Comm Channel Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                               | 0 – 15                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Comm Channel Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                  |       |               |               |

| 2065.22h                                                                                                                                                                                  | Event Action: User Positive Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | 0 – 15                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Positive Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                   |       |               |               |

| 2065.23h                                                                                                                                                                                  | Event Action: User Negative Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                 | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                | 0 – 15                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Negative Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                   |       |               |               |

| 2065.24h                                                                                                                                                                          | Event Action: Drive Reset |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                         | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                        | 0 – 15                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Drive Reset. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                           |       |               |               |

| 2065.25h                                                                                                                                                                                   | Event Action: Drive Internal Error |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                  | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                 | 0 – 15                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Drive Internal Error. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                    |       |               |               |

| 2065.26h                                                                                                                                                                            | Event Action: Short Circuit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                           | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                          | 0 – 15                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Short Circuit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                             |       |               |               |

| 2065.27h                                                                                                                                                                           | Event Action: Over Current |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                         | 0 – 15                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Over Current. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                            |       |               |               |

| 2065.28h                                                                                                                                                                                     | Event Action: Hardware Under Voltage |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Hardware Under Voltage. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.29h                                                                                                                                                                                    | Event Action: Hardware Over Voltage |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – 15                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Hardware Over Voltage. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                     |       |               |               |

| 2065.2Ah                                                                                                                                                                                     | Event Action: Drive Over Temperature |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Drive Over Temperature. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.2Bh                                                                                                                                                                               | Event Action: Software Disable |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 – 15                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Software Disable. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                |       |               |               |

| 2065.2Ch                                                                                                                                                                           | Event Action: User Disable |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                         | 0 – 15                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Disable. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                            |       |               |               |

| 2065.2Dh                                                                                                                                                                                     | Event Action: User Auxiliary Disable |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                    | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                   | 0 – 15                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a User Auxiliary Disable. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

| 2065.2Eh                                                                                                                                                                                    | Event Action: Phase Detection Fault |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                  | 0 – 15                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Phase Detection Fault. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                     |       |               |               |

| 2065.2Fh                                                                                                                                                                                       | Event Action: Commanded Positive Limit |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                     | 0 – 15                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Commanded Positive Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                        |       |               |               |

| 2065.30h                                                                                                                                                                                       | Event Action: Commanded Negative Limit |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                      | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                     | 0 – 15                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a Commanded Negative Limit. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                        |       |               |               |

| 2065.31h                                                                                                                                                                                            | Event Action: PWM and Direction Broken Wire |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                           | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                          | 0 – $[2^{(15)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a PWM and Direction Broken Wire. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                             |       |               |               |

| 2065.32h                                                                                                                                                                                            | Event Action: High Current Indicator |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                          | 0 – $[2^{(15)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>The action of the drive immediately after a High Current Indicator Faultt. Refer to <a href="#">Table 2.8</a> below for the valid event actions and their respective values. |                                      |       |               |               |

**TABLE 2.8** Event Action Options

| Sub Index | Event                   | Valid Event Action Values (refer to <a href="#">Table 2.9</a> for value definitions) |   |   |   |   |   |   |   |   |   |    |    |
|-----------|-------------------------|--------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|
| 01h       | Parameter Restore Error | -                                                                                    | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 02h       | Parameter Store Error   | -                                                                                    | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 03h       | Invalid Hall State      | -                                                                                    | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 04h       | Phase Synch Error       | 0                                                                                    | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 05h       | Motor Over Temperature  | 0                                                                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 06h       | Feedback Sensor Error   | 0                                                                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 07h       | Log Entry Missed        | 0                                                                                    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

|     |                             |   |   |   |   |   |   |   |   |   |   |    |    |
|-----|-----------------------------|---|---|---|---|---|---|---|---|---|---|----|----|
| 08h | Current Limiting            | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 09h | Continuous Current          | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 0Ah | Current Loop Saturated      | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 0Bh | User Under Voltage          | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 0Ch | User Over Voltage           | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 0Dh | Shunt Regulator             | 0 | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 0Eh | Command Limiter Active      | 0 | - | - | - | - | - | - | - | - | - | -  | -  |
| 0Fh | Motor Over Speed            | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 10h | At Command                  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 11h | Zero Velocity               | 0 | - | - | - | - | - | - | - | - | - | -  | -  |
| 12h | Velocity Following Error    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 13h | Positive Velocity Limit     | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 14h | Negative Velocity Limit     | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 15h | Max Measured Position Limit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 16h | Min Measured Position Limit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 17h | At Home Position            | 0 | - | - | - | - | - | - | - | - | - | -  | -  |
| 18h | Position Following Error    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 19h | Max Target Position Limit   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Ah | Min Target Position Limit   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Bh | Reserved                    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Ch | Reserved                    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Dh | Reserved                    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Eh | Reserved                    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1Fh | Reserved                    | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 20h | Reserved                    | 0 | 1 | 2 | 3 | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 21h | Comm Channel Error          | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 22h | User Positive Limit         | - | - | 2 | - | - | 5 | - | - | - | - | -  | -  |
| 23h | User Negative Limit         | - | - | - | 3 | - | - | 6 | - | - | - | -  | -  |
| 24h | Drive Reset                 | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 25h | Drive Internal Error        | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 26h | Short Circuit               | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 27h | Over Current                | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 28h | Hardware Under Voltage      | - | 1 | - | - | 4 | - | - | - | - | - | 10 | -  |
| 29h | Hardware Over Voltage       | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 2Ah | Drive Over Temperature      | - | 1 | - | - | - | - | - | - | - | - | 10 | -  |
| 2Bh | Software Disable            | - | 1 | - | - | - | - | - | - | 8 | - | 10 | -  |
| 2Ch | User Disable                | - | 1 | - | - | - | - | - | - | 8 | - | 10 | -  |
| 2Dh | User Auxiliary Disable      | - | 1 | - | - | 4 | - | - | - | 8 | 9 | 10 | 11 |
| 2Eh | Phase Detection Fault       | - | 1 | - | - | - | - | - | - | 8 | - | 10 | -  |
| 2Fh | Commanded Positive Limit    | - | - | 2 | - | - | 5 | - | - | - | - | -  | -  |
| 30h | Commanded Negative Limit    | - | - | - | 3 | - | - | 6 | - | - | - | -  | -  |
| 31h | PWM and Dir Broken Wire     | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | - | -  | -  |
| 32h | High Current Indicator      | 0 | 1 | 2 | 3 | - | 5 | 6 | - | 8 | - | 10 | -  |

TABLE 2.9 Event Action Values Definition

| Event Action Values | Hex Values | Event Actions                          |
|---------------------|------------|----------------------------------------|
| 0                   | 00h        | No Action                              |
| 1                   | 01h        | Disable Power Bridge                   |
| 2                   | 02h        | Disable Positive Direction             |
| 3                   | 03h        | Disable Negative Direction             |
| 4                   | 04h        | Dynamic Brake                          |
| 5                   | 05h        | Positive Stop                          |
| 6                   | 06h        | Negative Stop                          |
| 7                   | 07h        | Stop                                   |
| 8                   | 08h        | Apply Brake <b>then</b> Disable Bridge |
| 9                   | 09h        | Apply Brake <b>then</b> Dynamic Brake  |
| 10                  | 0Ah        | Apply Brake <b>and</b> Disable Bridge  |
| 11                  | 0Bh        | Apply Brake <b>and</b> Dynamic Brake   |

### 2066h: Event Recovery Time Parameters

| 2066.01h                                                                                                                         | Event Recovery Time: Motor Over Temperature |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                       | $0 - [2^{(16)} - 1]$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Motor Over Temperature is no longer true before its Event Action (2065h) is removed. |                                             |                   |               |               |

| 2066.02h                                                                                                                        | Event Recovery Time: Feedback Sensor Error |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                       | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                      | $0 - [2^{(16)} - 1]$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Feedback Sensor Error is no longer true before its Event Action (2065h) is removed. |                                            |                   |               |               |

| 2066.03h                                                                                                                   | Event Recovery Time: Log Entry Missed |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                 | $0 - [2^{(16)} - 1]$                  | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Log Entry Missed is no longer true before its Event Action (2065h) is removed. |                                       |                   |               |               |

| 2066.04h                                                                                                               | Event Recovery Time: User Disable |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                              | Data Range                        | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                             | $0 - [2^{(16)} - 1]$              | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after User Disable is no longer true before its Event Action (2065h) is removed. |                                   |                   |               |               |

| 2066.05h                                                                                                                 | Event Recovery Time: Positive Limit |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                | Data Range                          | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                               | $0 - [2^{(16)} - 1]$                | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Positive Limit is no longer true before its Event Action (2065h) is removed. |                                     |                   |               |               |

| 2066.06h                                                                                                                 | Event Recovery Time: Negative Limit |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                | Data Range                          | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                               | $0 - [2^{(16)} - 1]$                | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Negative Limit is no longer true before its Event Action (2065h) is removed. |                                     |                   |               |               |

| 2066.07h                                                                                                                   | Event Recovery Time: Current Limiting |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                 | $0 - [2^{(16)} - 1]$                  | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Current Limiting is no longer true before its Event Action (2065h) is removed. |                                       |                   |               |               |

| 2066.08h                                                                                                                              | Event Recovery Time: Continuous Current Limiting |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                             | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                            | $0 - [2^{(16)} - 1]$                             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Continuous Current Limiting is no longer true before its Event Action (2065h) is removed. |                                                  |                   |               |               |

| 2066.09h                                                                                                                                | Event Recovery Time: Current Loop Saturated |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                               | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                              | $0 - [2^{(16)} - 1]$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Current Loop Saturated status is no longer true before its Event Action (2065h) is removed. |                                             |                   |               |               |



| 2066.0Ah                                                                                                                     | Event Recovery Time: User Under Voltage |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                    | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                   | 0 – $[2^{(16)} - 1]$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after User Under Voltage is no longer true before its Event Action (2065h) is removed. |                                         |                   |               |               |

| 2066.0Bh                                                                                                                    | Event Recovery Time: User Over Voltage |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                   | Data Range                             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                  | 0 – $[2^{(16)} - 1]$                   | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after User Over Voltage is no longer true before its Event Action (2065h) is removed. |                                        |                   |               |               |

| 2066.0Ch                                                                                                                         | Event Recovery Time: User Auxiliary Disable |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                       | 0 – $[2^{(16)} - 1]$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after User Auxiliary Disable is no longer true before its Event Action (2065h) is removed. |                                             |                   |               |               |

| 2066.0Dh                                                                                                                         | Event Recovery Time: Shunt Regulator |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                           | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                       | 0 – $[2^{(16)} - 1]$                 | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Shunt Regulator active is no longer true before its Event Action (2065h) is removed. |                                      |                   |               |               |

| 2066.0Eh                                                                                                                         | Event Recovery Time: Command Limiter Active |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                       | 0 – $[2^{(16)} - 1]$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Command Limiter Active is no longer true before its Event Action (2065h) is removed. |                                             |                   |               |               |

| 2066.0Fh                                                                                                                   | Event Recovery Time: Motor Over Speed |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                 | 0 – $[2^{(16)} - 1]$                  | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Motor Over Speed is no longer true before its Event Action (2065h) is removed. |                                       |                   |               |               |

| 2066.10h                                                                                                             | Event Recovery Time: At Command |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                            | Data Range                      | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                           | $0 - [2^{(16)} - 1]$            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after At Command is no longer true before its Event Action (2065h) is removed. |                                 |                   |               |               |

| 2066.11h                                                                                                                | Event Recovery Time: Zero Velocity |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                               | Data Range                         | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                              | $0 - [2^{(16)} - 1]$               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Zero Velocity is no longer true before its Event Action (2065h) is removed. |                                    |                   |               |               |

| 2066.12h                                                                                                                           | Event Recovery Time: Velocity Following Error |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                          | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                         | $0 - [2^{(16)} - 1]$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Velocity Following Error is no longer true before its Event Action (2065h) is removed. |                                               |                   |               |               |

| 2066.13h                                                                                                                          | Event Recovery Time: Positive Velocity Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                         | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                        | $0 - [2^{(16)} - 1]$                         | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Positive Velocity Limit is no longer true before its Event Action (2065h) is removed. |                                              |                   |               |               |

| 2066.14h                                                                                                                          | Event Recovery Time: Negative Velocity Limit |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                         | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                        | $0 - [2^{(16)} - 1]$                         | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Negative Velocity Limit is no longer true before its Event Action (2065h) is removed. |                                              |                   |               |               |

| 2066.15h                                                                                                                                     | Event Recovery Time: Max Measured Position Limit |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                   | $0 - [2^{(16)} - 1]$                             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Max Measured Position Limit status is no longer true before its Event Action (2065h) is removed. |                                                  |                   |               |               |

| 2066.16h                                                                                                                                     | Event Recovery Time: Min Measured Position Limit |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                   | $0 - [2^{(16)} - 1]$                             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Min Measured Position Limit status is no longer true before its Event Action (2065h) is removed. |                                                  |                   |               |               |

| 2066.17h                                                                                                           | Event Recovery Time: At Home Position |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                          | Data Range                            | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                         | $0 - [2^{(16)} - 1]$                  | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after no longer At Home Position before its Event Action (2065h) is removed. |                                       |                   |               |               |

| 2066.18h                                                                                                                           | Event Recovery Time: Position Following Error |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                          | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                         | $0 - [2^{(16)} - 1]$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Position Following Error is no longer true before its Event Action (2065h) is removed. |                                               |                   |               |               |

| 2066.19h                                                                                                                            | Event Recovery Time: Max Target Position Limit |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                           | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                          | $0 - [2^{(16)} - 1]$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Max Target Position Limit is no longer true before its Event Action (2065h) is removed. |                                                |                   |               |               |

| 2066.1Ah                                                                                                                            | Event Recovery Time: Min Target Position Limit |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                           | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                          | $0 - [2^{(16)} - 1]$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Min Target Position Limit is no longer true before its Event Action (2065h) is removed. |                                                |                   |               |               |

| 2066.1Bh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.1Ch   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.1Dh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.1Eh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.1Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.20h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2066.21h                                                                                                                      | Event Recovery Time: Communication Error |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                     | Data Range                               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                    | 0 – $2^{(16)} - 1$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after Communication Error is no longer true before its Event Action (2065h) is removed. |                                          |                   |               |               |

| 2066.22h                                                                                                          | Event Recovery Time: User Stop |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                         | Data Range                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                        | 0 – $2^{(16)} - 1$             | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after User Stop is no longer true before it is considered no longer active. |                                |                   |               |               |

| 2066.23h                                                                                                                              | Event Recovery Time: PWM and Direction Broken Wire |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                             | Data Range                                         | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                            | 0 – $2^{(16)} - 1$                                 | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after PWM and Direction Broken Wire is no longer true before it is considered no longer active. |                                                    |                   |               |               |

| 2066.24h                                                                                                                             | Event Recovery Time: High Current Indicator |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                            | Data Range                                  | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                           | 0 – $2^{(16)} - 1$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time delay after High Current Indicator Fault is no longer true before it is considered no longer active. |                                             |                   |               |               |

### 2067h: Event Time-Out Window Parameters

| 2067.01h                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Time-Out Window: Motor Over Temperature |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – $2^{(16)} - 1$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Motor Over Temperature as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                               |                   |               |               |

| 2067.02h                                                                                                                                                                                                                                                                                                                                                                                                                                     | Event Time-Out Window: Feedback Sensor Error |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                    | Data Range                                   | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0 – $2^{(16)} - 1$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Feedback Sensor Error as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                              |                   |               |               |

| 2067.03h                                                                                                                                                                                                                                                                                                                                                                                                                            | Event Time-Out Window: User Disable |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                           | Data Range                          | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 – $2^{(16)} - 1$                  | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a User Disable as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                     |                   |               |               |

| 2067.04h                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Time-Out Window: User Positive Limit |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                            | $0 - [2^{(16)} - 1]$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Positive Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                            |                   |               |               |

| 2067.05h                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Time-Out Window: User Negative Limit |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                            | $0 - [2^{(16)} - 1]$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Negative Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                            |                   |               |               |

| 2067.06h                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Time-Out Window: Current Limiting |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                            | $0 - [2^{(16)} - 1]$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Current Limiting as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                         |                   |               |               |

| 2067.07h                                                                                                                                                                                                                                                                                                                                                                                                                                | Event Time-Out Window: Continuous Current |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range                                | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                              | $0 - [2^{(16)} - 1]$                      | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Continuous Current as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                           |                   |               |               |

| 2067.08h                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Time-Out Window: Current Loop Saturated |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                    | $0 - [2^{(16)} - 1]$                          | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Current Loop Saturated as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                               |                   |               |               |

| 2067.09h                                                                                                                                                                                                                                                                                                                                                                                                                                  | Event Time-Out Window: User Under Voltage |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                                | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – $2^{(16)} - 1$                        | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a User Under Voltage as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                           |                   |               |               |

| 2067.0Ah                                                                                                                                                                                                                                                                                                                                                                                                                                 | Event Time-Out Window: User Over Voltage |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                | Data Range                               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                               | 0 – $2^{(16)} - 1$                       | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a User Over Voltage as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                          |                   |               |               |

| 2067.0Bh                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Time-Out Window: User Auxiliary Disable |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – $2^{(16)} - 1$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a User Auxiliary Disable as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                               |                   |               |               |

| 2067.0Ch                                                                                                                                                                                                                                                                                                                                                                                                                               | Event Time-Out Window: Shunt Regulator |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Range                             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 – $2^{(16)} - 1$                     | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Shunt Regulator as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                        |                   |               |               |

| 2067.0Dh                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Time-Out Window: Command Limiter Active |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – $2^{(16)} - 1$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Command Limiter Active as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                               |                   |               |               |

| 2067.0Eh                                                                                                                                                                                                                                                                                                                                                                                                                                | Event Time-Out Window: Motor Over Speed |                   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                              | $0 - [2^{(16)} - 1]$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Motor Over Speed as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                         |                   |               |               |

| 2067.0Fh                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Time-Out Window: At Command |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                        | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                      | $0 - [2^{(16)} - 1]$              | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of At Command as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                   |                   |               |               |

| 2067.10h                                                                                                                                                                                                                                                                                                                                                                                                                           | Event Time-Out Window: Zero Velocity |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                          | Data Range                           | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                         | $0 - [2^{(16)} - 1]$                 | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Zero Velocity as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                      |                   |               |               |

| 2067.11h                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Time-Out Window: Velocity Following Error |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                      | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                      | $0 - [2^{(16)} - 1]$                            | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Velocity Following Error as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                 |                   |               |               |

| 2067.12h                                                                                                                                                                                                                                                                                                                                                                                                                                       | Event Time-Out Window: Positive Velocity Limit |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                     | $0 - [2^{(16)} - 1]$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Positive Velocity Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                |                   |               |               |



| 2067.13h                                                                                                                                                                                                                                                                                                                                                                                                                                       | Event Time-Out Window: Negative Velocity Limit |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range                                     | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                     | $0 - [2^{(16)} - 1]$                           | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Negative Velocity Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                |                   |               |               |

| 2067.14h                                                                                                                                                                                                                                                                                                                                                                                                                                         | Event Time-Out Window: Max Measured Position Limit |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                        | Data Range                                         | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                       | $0 - [2^{(16)} - 1]$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Max Measured Position Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                    |                   |               |               |

| 2067.15h                                                                                                                                                                                                                                                                                                                                                                                                                                         | Event Time-Out Window: Min Measured Position Limit |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                        | Data Range                                         | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                       | $0 - [2^{(16)} - 1]$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Min Measured Position Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                    |                   |               |               |

| 2067.16h                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Time-Out Window: At Home Position |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                              | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                            | $0 - [2^{(16)} - 1]$                    | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of At Home Position as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                         |                   |               |               |

| 2067.17h                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Time-Out Window: Position Following Error |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                      | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – $2^{(16)} - 1$                              | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Position Following Error as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                 |                   |               |               |

| 2067.18h                                                                                                                                                                                                                                                                                                                                                                                                                                       | Event Time-Out Window: Max Target Position Limit |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0 – $2^{(16)} - 1$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Max Target Position Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                  |                   |               |               |

| 2067.19h                                                                                                                                                                                                                                                                                                                                                                                                                                       | Event Time-Out Window: Min Target Position Limit |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range                                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0 – $2^{(16)} - 1$                               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of Min Target Position Limit as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                  |                   |               |               |

| 2067.1Ah   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.1Bh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.1Ch   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.1Dh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.1Eh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.1Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2067.20h                                                                                                                                                                                                                                                                                                                                                                                                                                   | Event Time-Out Window: Communication Error |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                                 | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 – $2^{(16)} - 1$                         | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a Communication Error as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                            |                   |               |               |

| 2067.21h                                                                                                                                                                                                                                                                                                                                                                                                                         | Event Time-Out Window: User Stop |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                        | Data Range                       | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                       | 0 – $2^{(16)} - 1$               | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of a User Stop as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                  |                   |               |               |

| 2067.22h                                                                                                                                                                                                                                                                                                                                                                                                                               | Event Time-Out Window: PWM and Direction Broken Wire |                   |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Range                                           | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 – $2^{(16)} - 1$                                   | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of PWM and Direction as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                                      |                   |               |               |

| 2067.23h                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Time-Out Window: High Current Indicator |                   |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                                    | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – $2^{16}-1$                                | milliseconds (ms) | Read / Write  | Yes           |
| <b>Description:</b><br>The time, after the Recovery Time (2066h) and subsequent removal of the event action, during which the drive will NOT consider an occurrence of High Current Indicator as a new occurrence. The Event Action (2065h) will still be applied in case an event does occur within this window. However, that occurrence will not be counted as a new occurrence with regard to the Maximum Recoveries (2068h) attribute. |                                               |                   |               |               |

### 2068h: Event Maximum Recoveries Parameters

| 2068.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Maximum Recoveries: Short Circuit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – 65535                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Short Circuit performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Short Circuit event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                         |       |               |               |

| 2068.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Hardware Under Voltage |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Hardware Under Voltage performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Hardware Under Voltage event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |

| 2068.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Maximum Recoveries: Hardware Over Voltage |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – 65535                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Hardware Over Voltage performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Hardware Over Voltage event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                 |       |               |               |

| 2068.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Drive Over Temperature |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Drive Over Temperature performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Drive Over Temperature event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |

| 2068.05h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Event Maximum Recoveries: Invalid Hall State |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 – 65535                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of an Invalid Hall State performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Invalid Hall State event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                              |       |               |               |

| 2068.06h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Event Maximum Recoveries: Phase Synchronization Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0 – 65535                                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Phase Synchronization Error performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Phase Synchronization Error event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                       |       |               |               |

| 2068.07h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Motor Over Temperature |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Motor Over Temperature performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Motor Over Temperature event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |

| 2068.08h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Maximum Recoveries: Phase Detection Failure |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 65535                                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Phase Detection Failure performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Phase Detection Failure event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                   |       |               |               |

| 2068.09h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Maximum Recoveries: Feedback Sensor Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – 65535                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Feedback Sensor Error performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Feedback Sensor Error event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                 |       |               |               |

| 2068.0Ah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Event Maximum Recoveries: Log Entry Missed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0 – 65535                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Log Entry Missed performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Log Entry Missed event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                            |       |               |               |

| 2068.0Bh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Event Maximum Recoveries: User Disable |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – 65535                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a User Disable performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the User Disable event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                        |       |               |               |

| 2068.0Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: User Positive Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Positive Limit performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Positive Limit event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                               |       |               |               |

| 2068.0Dh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: User Negative Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Negative Limit performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Negative Limit event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                               |       |               |               |

| 2068.0Eh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Maximum Recoveries: Current Limiting |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 65535                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Current Limiting performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Current Limiting event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                            |       |               |               |

| 2068.0Fh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Maximum Recoveries: Continuous Current Limiting |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – 65535                                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Continuous Current Limiting performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Continuous Current Limiting event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                       |       |               |               |

| 2068.10h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Maximum Recoveries: Current Loop Saturated |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Current Loop Saturated performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Current Loop Saturated event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |

| 2068.11h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Maximum Recoveries: User Under Voltage |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – 65535                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a User Under Voltage performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the User Under Voltage event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                              |       |               |               |

| 2068.12h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Event Maximum Recoveries: User Over Voltage |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 – 65535                                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a User Over Voltage performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the User Over Voltage event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                             |       |               |               |

| 2068.13h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: User Auxiliary Disable |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a User Auxiliary Disable performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the User Auxiliary Disable event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |



| 2068.14h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Maximum Recoveries: Shunt Regulator |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 65535                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Shunt Regulator performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Shunt Regulator event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                           |       |               |               |

| 2068.15h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Command Limiter Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Command Limiter Active performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Command Limiter Active event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                  |       |               |               |

| 2068.16h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Event Maximum Recoveries: Motor Over Speed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0 – 65535                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of a Motor Over Speed performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Motor Over Speed event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                            |       |               |               |

| 2068.17h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Event Maximum Recoveries: At Command |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 – 65535                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of At Command performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the At Command event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                      |       |               |               |

| 2068.18h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Event Maximum Recoveries: Zero Velocity |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – 65535                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Zero Velocity performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Zero Velocity event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                         |       |               |               |

| 2068.19h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Maximum Recoveries: Velocity Following Error |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 65535                                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Velocity Following Error performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Velocity Following Error event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                    |       |               |               |

| 2068.1Ah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Positive Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Positive Velocity Limit performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Positive Velocity Limit event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                   |       |               |               |

| 2068.1Bh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Event Maximum Recoveries: Negative Velocity Limit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0 – 65535                                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Negative Velocity Limit performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Negative Velocity Limit event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                   |       |               |               |

| 2068.1Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Event Maximum Recoveries: Max Measured Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – 65535                                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Max Measured Position performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Max Measured Position event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                       |       |               |               |

| 2068.1Dh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Event Maximum Recoveries: Min Measured Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 – 65535                                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Min Measured Position performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Min Measured Position event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                       |       |               |               |

| 2068.1Eh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Event Maximum Recoveries: At Home Position |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0 – 65535                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of At Home Position performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the At Home Position event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                            |       |               |               |

| 2068.1Fh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Event Maximum Recoveries: Position Following Errors |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Data Range                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0 – 65535                                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Position Following Errors performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Position Following Errors event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                     |       |               |               |

| 2068.20h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Maximum Recoveries: Max Target Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – 65535                                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Max Target Position performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Max Target Position event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                     |       |               |               |

| 2068.21h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Event Maximum Recoveries: Min Target Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 – 65535                                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Min Target Position performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Min Target Position event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                                     |       |               |               |

| 2068.22h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.23h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.24h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.25h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.26h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.27h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 2068.28h   | Event Maximum Recoveries: Communication Error |       |               |               |
|------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type  | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16 | 0 – 65535                                     | N/A   | Read / Write  | Yes           |

**Description:**

Each occurrence of Communication Error performs the action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Communication Error event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software.

| 2068.29h   | Event Maximum Recoveries: User Stop |       |               |               |
|------------|-------------------------------------|-------|---------------|---------------|
| Data Type  | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16 | 0 – 65535                           | N/A   | Read / Write  | Yes           |

**Description:**

Each occurrence of User Stop performs the event action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the User Stop event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software.

| 2068.2Ah   | Event Maximum Recoveries: PWM and Direction Broken Wire |       |               |               |
|------------|---------------------------------------------------------|-------|---------------|---------------|
| Data Type  | Data Range                                              | Units | Accessibility | Stored to NVM |
| Unsigned16 | 0 – 65535                                               | N/A   | Read / Write  | Yes           |

**Description:**

Each occurrence of PWM and Direction Broken Wire performs the event action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the PWM and Direction Broken Wire event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software.

| 2068.2Bh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Event Maximum Recoveries: Motion Engine Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 – 65535                                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of Motion Engine Error performs the event action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the Motion Engine Error event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help file associated with the AMC drive configuration software. |                                               |       |               |               |

| 2068.2Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Event Maximum Recoveries: High Current Indicator |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0 – 65535                                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Each occurrence of High Current Indicator Fault performs the event action assigned to this event. Each time the event is removed for longer than the addition of the values in the Time-Out Window (2067h) and Recovery Time (2066h), a recovery counter is incremented. This object sets the maximum recovery count allowed before the High Current Indicator event latches and must be actively reset in order to enable the bridge. Re-setting the recovery counter requires a connection to the AMC drive configuration software appropriate for this drive. For more information on event handling, see the Help File associated with the AMC drive configuration software. |                                                  |       |               |               |

### 2069h: Event History Reset Parameters

| 2069.01h                                                                                                                                                                                                                                                                                | Event History Reset - Action Status |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                 | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                     |       |               |               |

| 2069.02h                                                                                                                                                                                                                                                                                | Event History Reset - Drive Protection |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                    | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                        |       |               |               |

| 2069.03h                                                                                                                                                                                                                                                                                | Event History Reset - System Protection |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                     | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                         |       |               |               |

| 2069.04h                                                                                                                                                                                                                                                                                | Event History Reset - System Status 1 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                   | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                       |       |               |               |

| 2069.05h                                                                                                                                                                                                                                                                                | Event History Reset - System Status 2 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                   | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                       |       |               |               |

| 2069.06h                                                                                                                                                                                                                                                                                | Event History Reset - System Status 3 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                               | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                              | N/A                                   | N/A   | Read / Write  | No            |
| <b>Description:</b><br>When a digital input is configured to the Reset Event History function, any bit with a value of 1 will have the corresponding event be cleared, history reset, and recovery counter reset to 0. The function of each bit is given in Table 2.15 of object 2002h. |                                       |       |               |               |

**205Bh: Programmable Status Parameters** Determines which events will be mapped to the StatusWord (6041h) bits, indicated below. When multiple events are mapped to a single bit, they will be logically OR-ed.

**TABLE 2.10 Programmable Status Mapping**

| Programmable Status Mask | Description                                          |
|--------------------------|------------------------------------------------------|
| Bit 9                    | Bit 11 (Internal Limit Active) in 6041h (StatusWord) |
| Bit 10...13              | Reserved                                             |

|        |                                                     |
|--------|-----------------------------------------------------|
| Bit 14 | Bit 7 (Warning) in 6041h (StatusWord)               |
| Bit 15 | Bit 8 (manufacturer specific) in 6041h (StatusWord) |

| 205B.01h                                                                                                                                                         | Programmable Status Mask: Drive Reset |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Drive Reset event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.02h                                                                                                                                                                  | Programmable Status Mask: Drive Internal Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Drive Internal Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.03h                                                                                                                                                           | Programmable Status Mask: Short Circuit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Short Circuit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                         |       |               |               |

| 205B.04h                                                                                                                                                          | Programmable Status Mask: Over Current |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Over Current event. See <a href="#">Table 2.10</a> above for mapping structure. |                                        |       |               |               |

| 205B.05h                                                                                                                                                                    | Programmable Status Mask: Hardware Under Voltage |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Hardware Under Voltage event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |



| 205B.06h                                                                                                                                                                   | Programmable Status Mask: Hardware Over Voltage |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Hardware Over Voltage event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.07h                                                                                                                                                                    | Programmable Status Mask: Drive Over Temperature |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Drive Over Temperature event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.08h                                                                                                                                                                     | Programmable Status Mask: Parameter Restore Error |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Parameter Restore Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                   |       |               |               |

| 205B.09h                                                                                                                                                                   | Programmable Status Mask: Parameter Store Error |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Parameter Store Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.0Ah                                                                                                                                                                | Programmable Status Mask: Invalid Hall State |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Invalid Hall State event. See <a href="#">Table 2.10</a> above for mapping structure. |                                              |       |               |               |

| 205B.0Bh                                                                                                                                                                         | Programmable Status Mask: Phase Synchronization Error |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Phase Synchronization Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                       |       |               |               |

| 205B.0Ch                                                                                                                                                                    | Programmable Status Mask: Motor Over Temperature |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Motor Over Temperature event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.0Dh                                                                                                                                                                   | Programmable Status Mask: Phase Detection Fault |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Phase Detection Fault event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.0Eh                                                                                                                                                                   | Programmable Status Mask: Feedback Sensor Error |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Feedback Sensor Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.0Fh                                                                                                                                                              | Programmable Status Mask: Log Entry Missed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Log Entry Missed event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.10h                                                                                                                                                              | Programmable Status Mask: Software Disable |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Software Disable Event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.11h                                                                                                                                                          | Programmable Status Mask: User Disable |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                         | Data Range                             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                        | 0 - $[2^{(16)} - 1]$                   | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Disable Event. See <a href="#">Table 2.10</a> above for mapping structure. |                                        |       |               |               |

| 205B.12h                                                                                                                                                            | Programmable Status Mask: Positive Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Positive Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                          |       |               |               |

| 205B.13h                                                                                                                                                            | Programmable Status Mask: Negative Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Negative Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                          |       |               |               |

| 205B.14h                                                                                                                                                              | Programmable Status Mask: Current Limiting (Foldback) |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Current Limiting event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                       |       |               |               |

| 205B.15h                                                                                                                                                                              | Programmable Status Mask: Continuous Current Limit Reached |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                             | Data Range                                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Continuous Current Limit Reached event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                            |       |               |               |

| 205B.16h                                                                                                                                                                | Programmable Status Mask: Current Loop Saturated |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to Current Loop Saturated event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.17h                                                                                                                                                                | Programmable Status Mask: User Under Voltage |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Under Voltage event. See <a href="#">Table 2.10</a> above for mapping structure. |                                              |       |               |               |

| 205B.18h                                                                                                                                                               | Programmable Status Mask: User Over Voltage |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                              | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                             | 0 - $[2^{(16)} - 1]$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Over Voltage event. See <a href="#">Table 2.10</a> above for mapping structure. |                                             |       |               |               |

| 205B.19h                                                                                                                                                                        | Programmable Status Mask: Non-sinusoidal Commutation |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Non-sinusoidal Commutation event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                      |       |               |               |

| 205B.1Ah                                                                                                                                                             | Programmable Status Mask: Phase Detection |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Phase Detection event. See <a href="#">Table 2.10</a> above for mapping structure. |                                           |       |               |               |

| 205B.1Bh                                                                                                                                                                    | Programmable Status Mask: User Auxiliary Disable |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Auxiliary Disable event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.1Ch                                                                                                                                                             | Programmable Status Mask: Shunt Regulator |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $[2^{(16)} - 1]$                      | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Shunt Regulator event. See <a href="#">Table 2.10</a> above for mapping structure. |                                           |       |               |               |

| 205B.1Dh                                                                                                                                                                      | Programmable Status Mask: Phase Detection Complete |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Phase Detection Complete event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.1Eh                                                                                                                                                                    | Programmable Status Mask: Command Limiter Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Command Limiter Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.1Fh                                                                                                                                                              | Programmable Status Mask: Motor Over Speed |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Motor Over Speed event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.20h                                                                                                                                                        | Programmable Status Mask: At Command |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the At Command event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.21h                                                                                                                                                           | Programmable Status Mask: Zero Velocity |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Zero Velocity event. See <a href="#">Table 2.10</a> above for mapping structure. |                                         |       |               |               |

| 205B.22h                                                                                                                                                                      | Programmable Status Mask: Velocity Following Error |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Velocity Following Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.23h                                                                                                                                                                     | Programmable Status Mask: Positive Velocity Limit |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Positive Velocity Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                   |       |               |               |

| 205B.24h                                                                                                                                                                     | Programmable Status Mask: Negative Velocity Limit |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                   | 0 - $[2^{(16)} - 1]$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Negative Velocity Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                   |       |               |               |

| 205B.25h                                                                                                                                                                   | Programmable Status Mask: Max Measured Position Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Max Measured Position event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                       |       |               |               |

| 205B.26h                                                                                                                                                                         | Programmable Status Mask: Min Measured Position Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range                                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Min Measured Position Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                       |       |               |               |

| 205B.27h                                                                                                                                                              | Programmable Status Mask: At Home Position |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the At Home Position event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.28h                                                                                                                                                                      | Programmable Status Mask: Position Following Error |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Position Following Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.29h                                                                                                                                                                       | Programmable Status Mask: Max Target Position Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                      | Data Range                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                     | 0 - $[2^{(16)} - 1]$                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Max Target Position Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                     |       |               |               |

| 205B.2Ah                                                                                                                                                                       | Programmable Status Mask: Min Target Position Limit |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                      | Data Range                                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                     | 0 - $[2^{(16)} - 1]$                                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Min Target Position Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                     |       |               |               |

| 205B.2Bh                                                                                                                                                                   | Programmable Status Mask: Set Measured Position |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Set Measured Position event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.2Ch                                                                                                                                                           | Programmable Status Mask: Homing Active |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                          | Data Range                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Homing Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                         |       |               |               |

| 205B.2Dh                                                                                                                                                         | Programmable Status Mask: Apply Brake |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Apply Brake event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.2Eh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.2Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.30h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.31h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.32h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.33h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | Yes           |

| 205B.34h                                                                                                                                                                      | Programmable Status Mask: Communication Error |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $2^{(16)} - 1$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Communication Error Mask event. See <a href="#">Table 2.10</a> above for mapping structure. |                                               |       |               |               |

| 205B.35h                                                                                                                                                             | Programmable Status Mask: Homing Complete |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - $2^{(16)} - 1$                        | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Homing Complete event. See <a href="#">Table 2.10</a> above for mapping structure. |                                           |       |               |               |

| 205B.36h                                                                                                                                                            | Programmable Status Mask: Commanded Stop |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $2^{(16)} - 1$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Commanded Stop event. See <a href="#">Table 2.10</a> above for mapping structure. |                                          |       |               |               |

| 205B.37h                                                                                                                                                       | Programmable Status Mask: User Stop |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $2^{(16)} - 1$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Stop event. See <a href="#">Table 2.10</a> above for mapping structure. |                                     |       |               |               |



| 205B.38h                                                                                                                                                            | Programmable Status Mask: Bridge Enabled |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - $[2^{(16)} - 1]$                     | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Bridge Enabled event. See <a href="#">Table 2.10</a> above for mapping structure. |                                          |       |               |               |

| 205B.39h                                                                                                                                                                  | Programmable Status Mask: Dynamic Brake Active |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Dynamic Brake Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.3Ah                                                                                                                                                         | Programmable Status Mask: Stop Active |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Stop Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.3Bh                                                                                                                                                                  | Programmable Status Mask: Positive Stop Active |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Positive Stop Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.3Ch                                                                                                                                                                  | Programmable Status Mask: Negative Stop Active |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Negative Stop Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.3Dh                                                                                                                                                              | Programmable Status Mask: Positive Inhibit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Positive Inhibit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.3Eh                                                                                                                                                              | Programmable Status Mask: Negative Inhibit |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                            | 0 - $[2^{(16)} - 1]$                       | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Negative Inhibit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                            |       |               |               |

| 205B.3Fh                                                                                                                                                        | Programmable Status Mask: User Bit 0 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 0 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.40h                                                                                                                                                        | Programmable Status Mask: User Bit 1 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 1 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.41h                                                                                                                                                        | Programmable Status Mask: User Bit 2 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 2 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.42h                                                                                                                                                        | Programmable Status Mask: User Bit 3 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 3 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.43h                                                                                                                                                        | Programmable Status Mask: User Bit 4 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 4 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.44h                                                                                                                                                        | Programmable Status Mask: User Bit 5 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 5 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.45h                                                                                                                                                        | Programmable Status Mask: User Bit 6 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 6 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.46h                                                                                                                                                        | Programmable Status Mask: User Bit 7 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 7 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.47h                                                                                                                                                        | Programmable Status Mask: User Bit 8 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 8 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.48h                                                                                                                                                        | Programmable Status Mask: User Bit 9 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 9 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                      |       |               |               |

| 205B.49h                                                                                                                                                         | Programmable Status Mask: User Bit 10 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 10 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Ah                                                                                                                                                         | Programmable Status Mask: User Bit 11 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 11 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Bh                                                                                                                                                         | Programmable Status Mask: User Bit 12 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 12 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Ch                                                                                                                                                         | Programmable Status Mask: User Bit 13 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 13 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Dh                                                                                                                                                         | Programmable Status Mask: User Bit 14 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 14 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Eh                                                                                                                                                         | Programmable Status Mask: User Bit 15 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the User Bit 15 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                       |       |               |               |

| 205B.4Fh                                                                                                                                                       | Programmable Status Mask: Capture 1 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Capture 1 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                     |       |               |               |

| 205B.50h                                                                                                                                                       | Programmable Status Mask: Capture 2 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                     | 0 - $[2^{(16)} - 1]$                | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Capture 2 event. See <a href="#">Table 2.10</a> above for mapping structure. |                                     |       |               |               |

| 205B.51h                                                                                                                                                                   | Programmable Status Mask: Thermal Monitor Fault |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Thermal Monitor Fault event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.52h                                                                                                                                                                      | Programmable Status Mask: Commanded Positive Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Commanded Positive Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.53h                                                                                                                                                                      | Programmable Status Mask: Commanded Negative Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Commanded Negative Limit event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.54h                                                                                                                                                                    | Programmable Status Mask: Safe Torque Off Active |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                             | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Safe Torque Off Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                  |       |               |               |

| 205B.55h                                                                                                                                                                 | Programmable Status Mask: Zero Position Error |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | N/A                                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Zero Position Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                               |       |               |               |

| 205B.56h                                                                                                                                                                 | Programmable Status Mask: Motion Engine Error |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Motion Engine Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                               |       |               |               |

| 205B.57h                                                                                                                                                                  | Programmable Status Mask: Motion Engine Active |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Motion Engine Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.58h                                                                                                                                                                   | Programmable Status Mask: Active Motion Execute |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Execute event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.59h                                                                                                                                                                | Programmable Status Mask: Active Motion Busy |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Busy event. See <a href="#">Table 2.10</a> above for mapping structure. |                                              |       |               |               |

| 205B.5Ah                                                                                                                                                                  | Programmable Status Mask: Active Motion Active |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                 | Data Range                                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                | 0 - $[2^{(16)} - 1]$                           | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Active event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                |       |               |               |

| 205B.5Bh                                                                                                                                                                      | Programmable Status Mask: Active Motion MotionDone |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                     | Data Range                                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                    | 0 - $[2^{(16)} - 1]$                               | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion MotionDone event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                    |       |               |               |

| 205B.5Ch                                                                                                                                                                        | Programmable Status Mask: Active Motion SequenceDone |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                       | Data Range                                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                      | 0 - $[2^{(16)} - 1]$                                 | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion SequenceDone event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                      |       |               |               |

| 205B.5Dh                                                                                                                                                                | Programmable Status Mask: Active Motion Done |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                               | Data Range                                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                              | 0 - $[2^{(16)} - 1]$                         | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Done event. See <a href="#">Table 2.10</a> above for mapping structure. |                                              |       |               |               |

| 205B.5Eh                                                                                                                                                                   | Programmable Status Mask: Active Motion Aborted |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                  | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                 | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Aborted event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

| 205B.5Fh                                                                                                                                                                 | Programmable Status Mask: Active Motion Error |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Active Motion Error event. See <a href="#">Table 2.10</a> above for mapping structure. |                                               |       |               |               |

| 205B.60h                                                                                                                                                                           | Programmable Status Mask: PWM and Direction Broken Wire |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                                              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                         | 0 - $[2^{(16)} - 1]$                                    | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the PWM and Direction Broken Wire event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                         |       |               |               |

| 205B.61h                                                                                                                                                                 | Programmable Status Mask: Motion Engine Abort |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                               | 0 - $[2^{(16)} - 1]$                          | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Motion Engine Abort event. See <a href="#">Table 2.10</a> above for mapping structure. |                                               |       |               |               |

| 205B.62h                                                                                                                                                                         | Programmable Status Mask: Current Monitor Warning |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                        | Data Range                                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                       | 0 - $[2^{(16)} - 1]$                              | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the Sustained Current Indicator event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                   |       |               |               |

| 205B.63h                                                                                                                                                                    | Programmable Status Mask: Current Monitor Fault |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                   | Data Range                                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                  | 0 - $[2^{(16)} - 1]$                            | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Specifies which StatusWord bit, if any, is assigned to the High Current Indicator event. See <a href="#">Table 2.10</a> above for mapping structure. |                                                 |       |               |               |

## 208Ch: Product Information

| 208C.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Hardware Information                            |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------|---------------|---------------|------------------|-------------|-------|----------|--------|--------------------|---------|-----------------------|---------|-----------------------------|----------|--------------------------|-----------|--------------------------|-----------|----------|-----------|-------------------------------------------------|-----------|-----------------|-----------|-----------------------|-----------|--------------------|-----------|--------------------|-----------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range                                      | Units | Accessibility | Stored to NVM |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| String(390)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ASCII                                           | N/A   | Read Only     | Yes           |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| <b>Description:</b><br>Provides all the drive information in a single 390-byte string. The meaning of each byte in the string is divided into sections according to the following table. Bytes 2 through 33 provide the “Control Board Name” for example.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                 |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| <table><tr><th>Byte Definitions</th><th>Description</th></tr><tr><td>0...1</td><td>Reserved</td></tr><tr><td>2...33</td><td>Control Board Name</td></tr><tr><td>34...65</td><td>Control Board Version</td></tr><tr><td>66...97</td><td>Control Board Serial Number</td></tr><tr><td>98...129</td><td>Control Board Build Date</td></tr><tr><td>130...161</td><td>Control Board Build Time</td></tr><tr><td>162...191</td><td>Reserved</td></tr><tr><td>192...223</td><td>Product Part Number (including revision letter)</td></tr><tr><td>224...255</td><td>Product Version</td></tr><tr><td>256...287</td><td>Product Serial Number</td></tr><tr><td>288...319</td><td>Product Build Date</td></tr><tr><td>320...351</td><td>Product Build Time</td></tr><tr><td>352...390</td><td>Reserved</td></tr></table> |                                                 |       |               |               | Byte Definitions | Description | 0...1 | Reserved | 2...33 | Control Board Name | 34...65 | Control Board Version | 66...97 | Control Board Serial Number | 98...129 | Control Board Build Date | 130...161 | Control Board Build Time | 162...191 | Reserved | 192...223 | Product Part Number (including revision letter) | 224...255 | Product Version | 256...287 | Product Serial Number | 288...319 | Product Build Date | 320...351 | Product Build Time | 352...390 | Reserved |
| Byte Definitions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Description                                     |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 0...1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reserved                                        |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 2...33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Control Board Name                              |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 34...65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Control Board Version                           |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 66...97                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Control Board Serial Number                     |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 98...129                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Control Board Build Date                        |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 130...161                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Control Board Build Time                        |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 162...191                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                        |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 192...223                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Product Part Number (including revision letter) |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 224...255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Product Version                                 |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 256...287                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Product Serial Number                           |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 288...319                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Product Build Date                              |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 320...351                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Product Build Time                              |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |
| 352...390                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reserved                                        |       |               |               |                  |             |       |          |        |                    |         |                       |         |                             |          |                          |           |                          |           |          |           |                                                 |           |                 |           |                       |           |                    |           |                    |           |          |

## 2090h: Firmware Information

| 2090.01h                                                                                                                | Main Firmware Version |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                               | Data Range            | Units | Accessibility | Stored to NVM |
| String(32)                                                                                                              | ASCII                 | N/A   | Read Only     | Yes           |
| <b>Description:</b><br>Returns a 32-byte string containing the firmware version that is currently running on the drive. |                       |       |               |               |



| 2090.02h                                                                                                                  | Bootloader Firmware Version |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                 | Data Range                  | Units | Accessibility | Stored to NVM |
| String(32)                                                                                                                | ASCII                       | N/A   | Read Only     | Yes           |
| <b>Description:</b><br>Returns a 32-byte string containing the bootloader version that is currently running on the drive. |                             |       |               |               |

### 20D8h: Power Board Values

| 20D8.01h                                                                 | Power Board Map ID |                                   |                                                                                     |               |
|--------------------------------------------------------------------------|--------------------|-----------------------------------|-------------------------------------------------------------------------------------|---------------|
| Data Type                                                                | Data Range         | Units                             | Accessibility                                                                       | Stored to NVM |
| Unsigned16                                                               | 0 - $2^{(16)} - 1$ | N/A                               | Read Only                                                                           | No            |
| <b>Description:</b><br>Contains the bitfield for the Power Board Map ID. |                    |                                   |                                                                                     |               |
| <b>Bits</b>                                                              |                    | <b>Name</b>                       | <b>Description</b>                                                                  |               |
| Low Byte<br>High Byte                                                    |                    | Power Board Map ID Minor Bit #0-7 | Part of an 8-bit field used to store the Power Board Map ID's Minor Revision Number |               |
| 8 - 15                                                                   |                    | Power Board Map ID Major Bit #0-7 | Part of an 8-bit field used to store the Power Board Map ID's Major Revision Number |               |

| 20D8.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Power Board Build Data |                  |                 |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|-----------------|---------------|-------------|---------------|------------------|-------------|------------------|---|------------|-----------------|---------------------|---|-----------|----------------|---------------------------|---|------------|-----------------|------------------------|---|-----------|----------------|------------------------|---|-----------|----------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Data Range             | Units            | Accessibility   | Stored to NVM |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| See Table                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                    | See Table        | Read Only       | No            |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| <b>Description:</b><br>Contains the Power Board Build Data Structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |                  |                 |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| <table><tr><th>Member Name</th><th>Member Offset</th><th>Member Data Type</th><th>Member Unit</th></tr><tr><td>Power Board Name</td><td>0</td><td>String(50)</td><td>Text - 50 bytes</td></tr><tr><td>Power Board Version</td><td>1</td><td>String(8)</td><td>Text - 8 bytes</td></tr><tr><td>Power Board Serial Number</td><td>2</td><td>String(16)</td><td>Text - 16 bytes</td></tr><tr><td>Power Board Build Date</td><td>3</td><td>String(8)</td><td>Text - 8 bytes</td></tr><tr><td>Power Board Build Time</td><td>4</td><td>String(8)</td><td>Text - 8 bytes</td></tr></table> |                        |                  |                 |               | Member Name | Member Offset | Member Data Type | Member Unit | Power Board Name | 0 | String(50) | Text - 50 bytes | Power Board Version | 1 | String(8) | Text - 8 bytes | Power Board Serial Number | 2 | String(16) | Text - 16 bytes | Power Board Build Date | 3 | String(8) | Text - 8 bytes | Power Board Build Time | 4 | String(8) | Text - 8 bytes |
| Member Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Member Offset          | Member Data Type | Member Unit     |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| Power Board Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                      | String(50)       | Text - 50 bytes |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| Power Board Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                      | String(8)        | Text - 8 bytes  |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| Power Board Serial Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                      | String(16)       | Text - 16 bytes |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| Power Board Build Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3                      | String(8)        | Text - 8 bytes  |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |
| Power Board Build Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                      | String(8)        | Text - 8 bytes  |               |             |               |                  |             |                  |   |            |                 |                     |   |           |                |                           |   |            |                 |                        |   |           |                |                        |   |           |                |

| 20D8.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bus Voltage Data |                  |               |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|---------------|---------------|-------------|---------------|------------------|-------------|-------------------|---|------------|---------|------------------------|---|------------|---------|-----------------------|---|------------|---------|------------------|---|------------|---------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                               | Data Range       | Units            | Accessibility | Stored to NVM |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| See Table                                                                                                                                                                                                                                                                                                                                                                                                                                               | N/A              | See Table        | Read Only     | No            |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| <b>Description:</b><br>Contains the Bus Voltage Data Structure.                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |               |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| <table><tr><th>Member Name</th><th>Member Offset</th><th>Member Data Type</th><th>Member Unit</th></tr><tr><td>Rated Bus Voltage</td><td>0</td><td>Unsigned16</td><td>.1 Volt</td></tr><tr><td>Hardware Under Voltage</td><td>1</td><td>Unsigned16</td><td>.1 Volt</td></tr><tr><td>Hardware Over Voltage</td><td>2</td><td>Unsigned16</td><td>.1 Volt</td></tr><tr><td>Per Unit Voltage</td><td>3</td><td>Unsigned16</td><td>.1 Volt</td></tr></table> |                  |                  |               |               | Member Name | Member Offset | Member Data Type | Member Unit | Rated Bus Voltage | 0 | Unsigned16 | .1 Volt | Hardware Under Voltage | 1 | Unsigned16 | .1 Volt | Hardware Over Voltage | 2 | Unsigned16 | .1 Volt | Per Unit Voltage | 3 | Unsigned16 | .1 Volt |
| Member Name                                                                                                                                                                                                                                                                                                                                                                                                                                             | Member Offset    | Member Data Type | Member Unit   |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| Rated Bus Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0                | Unsigned16       | .1 Volt       |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| Hardware Under Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                | Unsigned16       | .1 Volt       |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| Hardware Over Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2                | Unsigned16       | .1 Volt       |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |
| Per Unit Voltage                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3                | Unsigned16       | .1 Volt       |               |             |               |                  |             |                   |   |            |         |                        |   |            |         |                       |   |            |         |                  |   |            |         |

| 20D8.04h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 20D8.05h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Phase Current Data |                  |               |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|---------------|---------------|-------------|---------------|------------------|-------------|--------------------|---|------------|---------|--------------------------|---|------------|---------|--------------|---|------------|---------|----------------------------|---|------------|---------|------------------------------|---|------------|------|----------------------------------------------|---|------------|------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Range         | Units            | Accessibility | Stored to NVM |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| See Table                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | N/A                | See Table        | Read Only     | No            |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| <b>Description:</b><br>Contains the Phase Current Data Structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                  |               |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| <table><tr><th>Member Name</th><th>Member Offset</th><th>Member Data Type</th><th>Member Unit</th></tr><tr><td>Rated Peak Current</td><td>0</td><td>Unsigned16</td><td>.1 Amps</td></tr><tr><td>Rated Continuous Current</td><td>1</td><td>Unsigned16</td><td>.1 Amps</td></tr><tr><td>Over Current</td><td>2</td><td>Unsigned16</td><td>.1 Amps</td></tr><tr><td>Maximum Measurable Current</td><td>3</td><td>Unsigned16</td><td>.1 Amps</td></tr><tr><td>Rated Peak Current Hold Time</td><td>4</td><td>Unsigned16</td><td>msec</td></tr><tr><td>Rated Peak to Rated Continuous Foldback Time</td><td>5</td><td>Unsigned16</td><td>msec</td></tr></table> |                    |                  |               |               | Member Name | Member Offset | Member Data Type | Member Unit | Rated Peak Current | 0 | Unsigned16 | .1 Amps | Rated Continuous Current | 1 | Unsigned16 | .1 Amps | Over Current | 2 | Unsigned16 | .1 Amps | Maximum Measurable Current | 3 | Unsigned16 | .1 Amps | Rated Peak Current Hold Time | 4 | Unsigned16 | msec | Rated Peak to Rated Continuous Foldback Time | 5 | Unsigned16 | msec |
| Member Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Member Offset      | Member Data Type | Member Unit   |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Rated Peak Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                  | Unsigned16       | .1 Amps       |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Rated Continuous Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                  | Unsigned16       | .1 Amps       |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Over Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                  | Unsigned16       | .1 Amps       |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Maximum Measurable Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                  | Unsigned16       | .1 Amps       |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Rated Peak Current Hold Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4                  | Unsigned16       | msec          |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |
| Rated Peak to Rated Continuous Foldback Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5                  | Unsigned16       | msec          |               |             |               |                  |             |                    |   |            |         |                          |   |            |         |              |   |            |         |                            |   |            |         |                              |   |            |      |                                              |   |            |      |

| 20D8.06h                                                                                                                                                                                                                                                                             | Commutation Frequency Data |                  |               |               |             |               |                  |             |                     |   |            |         |                      |   |            |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------|---------------|---------------|-------------|---------------|------------------|-------------|---------------------|---|------------|---------|----------------------|---|------------|---------|
| Data Type                                                                                                                                                                                                                                                                            | Data Range                 | Units            | Accessibility | Stored to NVM |             |               |                  |             |                     |   |            |         |                      |   |            |         |
| See Table                                                                                                                                                                                                                                                                            | N/A                        | See Table        | Read Only     | No            |             |               |                  |             |                     |   |            |         |                      |   |            |         |
| <b>Description:</b><br>Contains the Commutation Frequency Data Structure.                                                                                                                                                                                                            |                            |                  |               |               |             |               |                  |             |                     |   |            |         |                      |   |            |         |
| <table><tr><th>Member Name</th><th>Member Offset</th><th>Member Data Type</th><th>Member Unit</th></tr><tr><td>DC Cutoff Frequency</td><td>0</td><td>Unsigned16</td><td>100 uHz</td></tr><tr><td>Rms Cutoff Frequency</td><td>1</td><td>Unsigned16</td><td>100 uHz</td></tr></table> |                            |                  |               |               | Member Name | Member Offset | Member Data Type | Member Unit | DC Cutoff Frequency | 0 | Unsigned16 | 100 uHz | Rms Cutoff Frequency | 1 | Unsigned16 | 100 uHz |
| Member Name                                                                                                                                                                                                                                                                          | Member Offset              | Member Data Type | Member Unit   |               |             |               |                  |             |                     |   |            |         |                      |   |            |         |
| DC Cutoff Frequency                                                                                                                                                                                                                                                                  | 0                          | Unsigned16       | 100 uHz       |               |             |               |                  |             |                     |   |            |         |                      |   |            |         |
| Rms Cutoff Frequency                                                                                                                                                                                                                                                                 | 1                          | Unsigned16       | 100 uHz       |               |             |               |                  |             |                     |   |            |         |                      |   |            |         |

| 20D8.07h                                                       | PWM Period Data |                  |               |               |
|----------------------------------------------------------------|-----------------|------------------|---------------|---------------|
| Data Type                                                      | Data Range      | Units            | Accessibility | Stored to NVM |
| See Table                                                      | N/A             | See Table        | Read Only     | No            |
| <b>Description:</b><br>Contains the PWM Period Data Structure. |                 |                  |               |               |
| Member Name                                                    | Member Offset   | Member Data Type | Member Unit   |               |
| Max PWM Period                                                 | 0               | Unsigned16       | 100nsec       |               |
| Min PWM Period                                                 | 1               | Unsigned16       | 100nsec       |               |
| Nom PWM Period                                                 | 2               | Unsigned16       | 100nsec       |               |
| Default PWM Period                                             | 3               | Unsigned16       | 100nsec       |               |

| 20D8.08h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| N/A       | N/A        | N/A   | Read Only     | No            |

| 20D8.09h                                                            | Shunt Regulator Data |                  |               |               |
|---------------------------------------------------------------------|----------------------|------------------|---------------|---------------|
| Data Type                                                           | Data Range           | Units            | Accessibility | Stored to NVM |
| See Table                                                           | N/A                  | See Table        | Read Only     | No            |
| <b>Description:</b><br>Contains the Shunt Regulator Data Structure. |                      |                  |               |               |
| Member Name                                                         | Member Offset        | Member Data Type | Member Unit   |               |
| Max Shunt PWM Period                                                | 0                    | Unsigned16       | 100nsec       |               |
| Internal Rate Shunt Power                                           | 1                    | Unsigned16       | Watts         |               |
| Internal Shunt Resistance                                           | 2                    | Unsigned16       | 10 milliohms  |               |
| Continuous Shunt Current                                            | 3                    | Unsigned16       | 10 milliamps  |               |

| 20D8.0Ah                                                          | Thermal Limit Data |                  |                   |               |
|-------------------------------------------------------------------|--------------------|------------------|-------------------|---------------|
| Data Type                                                         | Data Range         | Units            | Accessibility     | Stored to NVM |
| See Table                                                         | N/A                | See Table        | Read only         | No            |
| <b>Description:</b><br>Contains the Thermal Limit Data Structure. |                    |                  |                   |               |
| Member Name                                                       | Member Offset      | Member Data Type | Member Unit       |               |
| Drive Disable Temperature                                         | 0                  | Unsigned16       | 10 millidegrees C |               |
| Drive Enable Temperature                                          | 1                  | Unsigned16       | 10 millidegrees C |               |
| Rate Temperature                                                  | 2                  | Unsigned16       | 10 millidegrees C |               |

| 20D8.0Bh                                                                       | Load Filter Efficiency |                     |               |               |
|--------------------------------------------------------------------------------|------------------------|---------------------|---------------|---------------|
| Data Type                                                                      | Data Range             | Units               | Accessibility | Stored to NVM |
| Unsigned16                                                                     | 0 - 10000              | % Efficiency * 0.01 | Read Only     | No            |
| <b>Description:</b><br>External motor filter efficiency (* .01 = % efficient). |                        |                     |               |               |

| 20D8.0Ch                                                                                                                           | Current Slew Rate    |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                          | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                         | 0 - $[2^{(32)} - 1]$ | A/s   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the maximum current slew rate limit supported by the drive's power board. |                      |       |               |               |

## 2.4 Drive Operation Objects

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The following objects are typically used during operation. They are either used to perform specific tasks or to obtain information from the drive. These objects have been divided into the following three categories: Control Objects, Command Objects, and Monitor Objects.

## 2.4.1 Control Objects

### 6040h: ControlWord

| 6040h      | ControlWord |       |               |               |
|------------|-------------|-------|---------------|---------------|
| Data Type  | Data Range  | Units | Accessibility | Stored to NVM |
| Unsigned16 | 0 - 65535   | N/A   | Read / Write  | No            |

**Description:**

The ControlWord object sets the control state machine in the drive. [“State Machine Overview” on page 35](#) explains each drive state and how to use the ControlWord to move the drive to that state. Below is a table providing the basic ControlWord commands and bit field definitions.

| Value (Hex) | Command          | Description                                            |
|-------------|------------------|--------------------------------------------------------|
| 80          | Reset Fault      | On any transition to "1" of bit 7 causes a Reset Fault |
| 04          | Disable Voltage  | Drive in "Switch On Disabled" state                    |
| 06          | Shutdown         | Drive in "Ready to Switch On" state                    |
| 07          | Switch On        | Drive in "Switched On" state                           |
| 0F          | Enable Operation | Drive in "Operation Enabled" state                     |
| 02          | Stop             | Drive in "Stop Active" state                           |
| 1F          | Start Homing     | Starts Homing (when in homing mode)                    |
| 0F          | End Homing       | Ends Homing                                            |

| Bit   | Name                     | Description                                                                                                                                                                                            |
|-------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0     | Switch On                | A transition from 0 to 1 commands the state machine into the Switched On state.                                                                                                                        |
| 1     | Disable Voltage          | A transition from 0 to 1 commands the state machine into the Switch On Disabled State.                                                                                                                 |
| 2     | Quick Stop               | A value of 0 activates a commanded stop.                                                                                                                                                               |
| 3     | Enable Operation         | A transition from 0 to 1 commands the state machine into Operation Enabled state.                                                                                                                      |
| 4     | Mode Specific 1          | In Jog Mode, Jog Select 0: Writing a 1 sets bit 0 of the Jog Speed Select. Writing a 0 clears it.<br>In Homing, Home Execute: Writing a 1 causes the homing routine to be active. Writing a 0 ends it. |
| 5     | Mode Specific 2          | In Jog Mode, Jog Plus: Writing a 1 asserts Jog Plus. Writing a 0 deasserts Jog Plus.                                                                                                                   |
| 6     | Mode Specific 3          | In Jog Mode, Jog Minus: Writing a 1 asserts Jog Minus. Writing a 0 deasserts Jog Minus.                                                                                                                |
| 7     | Reset Fault              | A transition from 0 to 1 activates a fault reset.                                                                                                                                                      |
| 8     | Reserved                 | Read as zero / write as zero.                                                                                                                                                                          |
| 9     | Mode Specific 4          | In Jog Mode, Jog Select 1: Writing a 1 sets bit 1 of the Jog Speed Select. Writing a 0 clears it.                                                                                                      |
| 10    | Reserved                 | Read as zero / write as zero.                                                                                                                                                                          |
| 11    | Dynamic Brake            | Activates the Dynamic Brake                                                                                                                                                                            |
| 12    | Commanded Negative Limit | Activates negative limiting.                                                                                                                                                                           |
| 13    | Commanded Positive Limit | Activates positive limiting.                                                                                                                                                                           |
| 14-15 | Reserved                 | Read as zero / write as zero.                                                                                                                                                                          |

See [“ControlWord \(6040h\)” on page 38](#) for more information on this subject.

**2001h: Control Parameters**

| 2001.01h                                                                                                     |                     | Drive Control Word 0                                                                                                                         |               |               |
|--------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                    | Data Range          | Units                                                                                                                                        | Accessibility | Stored to NVM |
| Unsigned16                                                                                                   | 0 – 1FFFh           | N/A                                                                                                                                          | Read/Write*   | No            |
| <b>Description:</b><br>This bit field enables/disables certain drive functions according to the table below. |                     |                                                                                                                                              |               |               |
| Bit                                                                                                          | Name                | Description                                                                                                                                  |               |               |
| 0                                                                                                            | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 1                                                                                                            | Zero Position Error | Sets the target position equal to the measured position.                                                                                     |               |               |
| 2                                                                                                            | Phase Detect        | Activates the phase detection routine.                                                                                                       |               |               |
| 3                                                                                                            | Set Position        | Causes the position counter to be loaded with the preset position value.                                                                     |               |               |
| 4                                                                                                            | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 5                                                                                                            | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 6                                                                                                            | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 7                                                                                                            | Capture 1 Arm       | A change from 0 to 1 arms/rearms Capture unit 1. A change from 1 to 0 Disarms it.                                                            |               |               |
| 8                                                                                                            | Capture 2 Arm       | A change from 0 to 1 arms/rearms Capture unit 2. A change from 1 to 0 Disarms it.                                                            |               |               |
| 9                                                                                                            | Capture 3 Arm       | A change from 0 to 1 arms/rearms Capture unit 3. A change from 1 to 0 Disarms it.                                                            |               |               |
| 10                                                                                                           | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 11                                                                                                           | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |
| 12                                                                                                           | Reset Events        | Resets all but the following events: Over Current, Parameter Restore Error, Parameter Store Error, Phase Detection Failure, Software Disable |               |               |
| 13-15                                                                                                        | Reserved            | Read as zero / write as zero.                                                                                                                |               |               |

| 2001.02h                                                                                                     |                                | Drive Control Word 1                                                                                    |               |               |
|--------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                                    | Data Range                     | Units                                                                                                   | Accessibility | Stored to NVM |
| Unsigned16                                                                                                   | 0 – 1FFFh                      | N/A                                                                                                     | Read/Write*   | No            |
| <b>Description:</b><br>This bit field enables/disables certain drive functions according to the table below. |                                |                                                                                                         |               |               |
| Bit                                                                                                          | Name                           | Description                                                                                             |               |               |
| 0                                                                                                            | Gain Parameters Set            | A change from 0 to 1 selects Gain Set 1. A change from 1 to 0 selects Gain Set 0.                       |               |               |
| 1                                                                                                            | Command Limiter Parameters Set | A change from 0 to 1 selects Command Limiter Set 1. A change from 1 to 0 selects Command Limiter Set 0. |               |               |
| 2                                                                                                            | Command Source Modifier Set    | A change from 0 to 1 selects Source Modifier Set 1. A change from 1 to 0 selects Source Modifier Set 0. |               |               |
| 3-15                                                                                                         | Reserved                       | Read as zero / write as zero.                                                                           |               |               |

| 2001.03h   | User Bit Control |       |               |               |
|------------|------------------|-------|---------------|---------------|
| Data Type  | Data Range       | Units | Accessibility | Stored to NVM |
| Unsigned16 | 0 – FFFFh        | N/A   | Read / Write  | No            |

**Description:**  
Toggles the User Bits on or off by assigning a 1 or 0 to the appropriate bit. See the table below for bit assignment. Note that User Bits can be mapped to digital outputs through the configuration software.

| Bit | Assignment (1 = asserted, 0 = not asserted) |
|-----|---------------------------------------------|
| 0   | User Bit 0                                  |
| 1   | User Bit 1                                  |
| 2   | User Bit 2                                  |
| 3   | User Bit 3                                  |
| 4   | User Bit 4                                  |
| 5   | User Bit 5                                  |
| 6   | User Bit 6                                  |
| 7   | User Bit 7                                  |
| 8   | User Bit 8                                  |
| 9   | User Bit 9                                  |
| 10  | User Bit 10                                 |
| 11  | User Bit 11                                 |
| 12  | User Bit 12                                 |
| 13  | User Bit 13                                 |
| 14  | User Bit 14                                 |
| 15  | User Bit 15                                 |



## 6060h: Modes Of Operation

| 6060h      | Modes Of Operation |       |               |               |
|------------|--------------------|-------|---------------|---------------|
| Data Type  | Data Range         | Units | Accessibility | Stored to NVM |
| Unsigned16 | -128 - 127         | N/A   | Read / Write  | No            |

**Description:**

This object indicates the requested mode of operation. This may differ from the actual mode of operation if the mode change is not yet possible (for example, if the mode change is requested while the drive is in the operation enabled state). The actual mode of operation can be found using the read-only object 6061. **“Modes of Operation” on page 49** explains the valid control loop configurations for an AMC servo drive.

| Value | Operation Mode                                |
|-------|-----------------------------------------------|
| 1     | Profile Position Mode                         |
| 3     | Profile Velocity Mode                         |
| 4     | Profile Torque Mode (current mode)            |
| 6     | Homing Mode                                   |
| 7     | Interpolated Position Mode (PVT)              |
| 8     | Cyclic Synchronous Position Mode              |
| 9     | Cyclic Synchronous Velocity Mode              |
| A     | Cyclic Synchronous Torque Mode (current mode) |
| 8C    | Jog Mode                                      |
| 9E    | Config 0                                      |
| DE    | Config 1                                      |
| EC    | Motion Engine Mode                            |
| FF    | None (Use active configuration settings)      |

## 2.4.2 Command Objects

### 6071h: Target Current

| 6071h                                                                                                                                                        | Target Current         |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range             | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $-2^{15} - (2^{15}-1)$ | DC2   | Read / Write  | No            |
| <b>Description:</b><br>Sets the Target Current while in Current Mode (set by object 6060h). See <a href="#">"Appendix" on page 337</a> for units conversion. |                        |       |               |               |

### 20C2h: Dynamic Current Target

| 20C2.01h                                                                                                                   | Dynamic Current Target Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                   | Units | Accessibility | Stored to NVM |
| Signed16                                                                                                                   | $0 - (2^{14})$               | DC1   | Read / Write  | No            |
| <b>Description:</b><br>Contains the value of the current target that will override the stored current limits when written. |                              |       |               |               |

| 20C2.02h                                                                                                                            | Dynamic Positive Current Target Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                           | Data Range                            | Units | Accessibility | Stored to NVM |
| Signed16                                                                                                                            | 0 – (2 <sup>14</sup> )                | DC1   | Read / Write  | No            |
| <b>Description:</b><br>Contains the value of the positive current target that will override the stored current limits when written. |                                       |       |               |               |

| 20C2.03h                                                                                                                            | Dynamic Negative Current Target Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                           | Data Range                            | Units | Accessibility | Stored to NVM |
| Signed16                                                                                                                            | 0 – (2 <sup>14</sup> )                | DC1   | Read / Write  | No            |
| <b>Description:</b><br>Contains the value of the negative current target that will override the stored current limits when written. |                                       |       |               |               |

### 60FFh: Target Velocity

| 60FFh                                                                                                                                                                 | Target Velocity                         |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                             | Data Range                              | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                             | -2 <sup>31</sup> – (2 <sup>31</sup> -1) | DS1   | Read / Write  | No            |
| <b>Description:</b><br>Use this object to set the Target Velocity when the drive is in Velocity mode. See <a href="#">“Appendix” on page 337</a> for unit conversion. |                                         |       |               |               |

### 607Ah: Target Position

| 607Ah                                                                                                                                                                                                                                                                                     | Target Position                         |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                 | Data Range                              | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                 | -2 <sup>31</sup> – (2 <sup>31</sup> -1) | counts | Read / Write  | No            |
| <b>Description:</b><br>Sets the Target Position value while in position mode (set by object 6060h). This is the target position before limiting and profiling is applied. Position error is derived from demanded position, which is this signal after limiting and profiling is applied. |                                         |        |               |               |

### 6078h: Current Monitor

| 6078h                                                                                                                  | Current Monitor                                |       |               |               |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                              | Data Range                                     | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                              | [-2 <sup>(15)</sup> ] - [2 <sup>(15)</sup> -1] | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the measured current after the Current Monitor biquad filter. |                                                |       |               |               |

**60B0h: Position Offset**

| 60B0h                                                                                                                                      | Position Offset                |        |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                  | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                  | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to offset for the target position value. Used with cycle synchronous position mode.. |                                |        |               |               |

**60B1h: Velocity Offset**

| 60B1h                                                                                                                                                                                                                                                                                                                                                           | Velocity Offset          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                       | Data Range               | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                      | $-2^{31} - (2^{31} - 1)$ | DS1   | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to offset for the target velocity value. Used with cyclic synchronous position and cyclic synchronous velocity modes. In cyclic synchronous position mode, this object contains the input value for velocity feed forward. In cyclic synchronous velocity mode it contains the commanded velocity offset. |                          |       |               |               |

**60B2h: Current Offset**

| 60B2h                                                                                                                                                                                                                                                                                                                                                               | Current Offset           |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                           | Data Range               | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                                                                           | $-2^{14} - (2^{14} - 1)$ | DC2   | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to offset for the target current value. Used with cyclic synchronous modes of operation. In cyclic synchronous position mode and cyclic synchronous velocity mode, this object contains the input value for current feed forward. In cyclic synchronous torque mode it contains the commanded current offset. |                          |       |               |               |

**2045h: Interface Inputs** Interface inputs can be used in place of analog inputs for any function that can be assigned to an analog input. Examples of this include command source, feedback source, and motor temperature source. The units for interface inputs are dependent upon the function the interface input is assigned to as given in [Table 2.11](#). For details on unit conversion see [“Appendix” on page 337](#).

**TABLE 2.11 Interface Input Units**

| Interface Input Function      | Units  |
|-------------------------------|--------|
| Position Command Source       | counts |
| Velocity Command Source       | DS1    |
| Torque/Current Command Source | DC2    |
| Position Feedback Source      | counts |
| Velocity Feedback Source      | DS1    |
| Motor Temperature Source      | DT1    |

| 2045.01h                                                              | Interface Input 1              |                                |               |               |
|-----------------------------------------------------------------------|--------------------------------|--------------------------------|---------------|---------------|
| Data Type                                                             | Data Range                     | Units                          | Accessibility | Stored to NVM |
| Integer32                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | See <a href="#">Table 2.11</a> | Read / Write  | No            |
| <b>Description:</b><br>Defines the value used with interface input 1. |                                |                                |               |               |

| 2045.02h                                                              | Interface Input 2              |                                |               |               |
|-----------------------------------------------------------------------|--------------------------------|--------------------------------|---------------|---------------|
| Data Type                                                             | Data Range                     | Units                          | Accessibility | Stored to NVM |
| Integer32                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | See <a href="#">Table 2.11</a> | Read / Write  | No            |
| <b>Description:</b><br>Defines the value used with interface input 2. |                                |                                |               |               |

| 2045.03h                                                              | Interface Input 3              |                                |               |               |
|-----------------------------------------------------------------------|--------------------------------|--------------------------------|---------------|---------------|
| Data Type                                                             | Data Range                     | Units                          | Accessibility | Stored to NVM |
| Integer32                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | See <a href="#">Table 2.11</a> | Read / Write  | No            |
| <b>Description:</b><br>Defines the value used with interface input 3. |                                |                                |               |               |

| 2045.04h                                                              | Interface Input 4              |                                |               |               |
|-----------------------------------------------------------------------|--------------------------------|--------------------------------|---------------|---------------|
| Data Type                                                             | Data Range                     | Units                          | Accessibility | Stored to NVM |
| Integer32                                                             | $[-2^{(31)}] - [2^{(31)} - 1]$ | See <a href="#">Table 2.11</a> | Read / Write  | No            |
| <b>Description:</b><br>Defines the value used with interface input 4. |                                |                                |               |               |

## 2.4.3 Motion Engine Command Objects

### 20C9h: Motion Engine Control

| 20C9.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Start-Up Motion Type |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A                  | N/A   | Read / Write  | Yes           |
| <b>Description:</b><br>Defines the startup behavior when running a motion engine index upon power-up. The bit values are broken up as defined below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |       |               |               |
| <b>Bits 0:15 - Enumerated values</b><br>0: Select Motion (This enum is only used when motion is initiated via a digital input.)<br>1: Initiate Selected Motion (Run the index or sequence specified in the Motion Engine Control Data)<br>2: Abort Active Motion (No fault, Motion Engine will return to ready for motion start)<br>3: Reserved. Write zero.<br>4: Initiate Dynamic Index<br>5: Set Motion Select Source<br>6: Indexer / Sequencer Select<br>7-15: Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |       |               |               |
| <b>Bits 16:31 - This is the data that is associated with each of the action enums above. The allowable values for each enum are as follows</b><br>0: Select Index - When the communication channel is the motion select source, the valid range is [0,15], otherwise it is an error<br>1: Initiate Selected Motion - When the communication channel is the motion select source, this value will be the motion that is initiated. Otherwise it will be ignored.<br>2: Abort Active Motion - Values are ignored<br>3: Reserved. Write zero.<br>4: Initiate Dynamic Index - Values are ignored<br>5: Set Motion Select Source - 0:Hardware, 1:Communication Channel - all other values are invalid<br>6: Indexer / Sequencer Select - When the communication channel is the motion select source, this value will be the motion type that is selected. Valid values are 0: Indexer, 1: Sequencer - all other values are invalid<br>7-15: Reserved |                      |       |               |               |

### 20CAh: Motion Engine Dynamic Index Data

| 20CA.01h                                                                                  | Move Index |       |               |               |
|-------------------------------------------------------------------------------------------|------------|-------|---------------|---------------|
| Data Type                                                                                 | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                | 0 - FFFFh  | -     | Read / Write  | No            |
| <b>Description:</b><br>When defining a dynamic index, this value should be set to 0x0020. |            |       |               |               |

| 20CA.02h                                                                                                                                                                                               | Move Type  |       |               |               |       |           |        |          |        |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|---------------|---------------|-------|-----------|--------|----------|--------|----------|
| Data Type                                                                                                                                                                                              | Data Range | Units | Accessibility | Stored to NVM |       |           |        |          |        |          |
| Unsigned16                                                                                                                                                                                             | 0 - FFFFh  | -     | Read / Write  | No            |       |           |        |          |        |          |
| <b>Description:</b><br>Defines the type of move. <div><table><tr><th>Value</th><th>Move Type</th></tr><tr><td>0x0008</td><td>Absolute</td></tr><tr><td>0x0018</td><td>Relative</td></tr></table></div> |            |       |               |               | Value | Move Type | 0x0008 | Absolute | 0x0018 | Relative |
| Value                                                                                                                                                                                                  | Move Type  |       |               |               |       |           |        |          |        |          |
| 0x0008                                                                                                                                                                                                 | Absolute   |       |               |               |       |           |        |          |        |          |
| 0x0018                                                                                                                                                                                                 | Relative   |       |               |               |       |           |        |          |        |          |

| 20CA.03h                                                                                                | Repeat Count |       |               |               |
|---------------------------------------------------------------------------------------------------------|--------------|-------|---------------|---------------|
| Data Type                                                                                               | Data Range   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 - FFFFh    | -     | Read / Write  | No            |
| <b>Description:</b><br>Specifies the number of times to repeat the move. Only valid for relative moves. |              |       |               |               |

| 20CA.04h                                                                                                          | Dwell Time |                   |               |               |
|-------------------------------------------------------------------------------------------------------------------|------------|-------------------|---------------|---------------|
| Data Type                                                                                                         | Data Range | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                        | 0 - FFFFh  | milliseconds (ms) | Read / Write  | No            |
| <b>Description:</b><br>Specifies the time after the move is complete before the Index Done status becomes active. |            |                   |               |               |

| 20CA.05h                                                                                                                                                                               | Position Target - Word 0 |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                              | Data Range               | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                             | 0 - FFFFh                | counts | Read / Write  | No            |
| <b>Description:</b><br>The least significant word in the 2-word (32-bit) position command. Depending on the assigned move type, will apply to an absolute or relative position target. |                          |        |               |               |

| 20CA.06h                                                                                                                                                                              | Position Target - Word 1 |        |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                             | Data Range               | Units  | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                            | 0 - FFFFh                | counts | Read / Write  | No            |
| <b>Description:</b><br>The most significant word in the 2-word (32-bit) position command. Depending on the assigned move type, will apply to an absolute or relative position target. |                          |        |               |               |

| 20CA.07h                                                                                                                                                         | Max Velocity - Word 0 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                        | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                       | 0 - FFFFh             | DS3   | Read / Write  | No            |
| <b>Description:</b><br>The least significant word in the 4-word (64-bit) maximum velocity value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                       |       |               |               |

| 20CA.08h                                                                                                                                              | Max Velocity - Word 1 |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                             | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                            | 0 - FFFFh             | DS3   | Read / Write  | No            |
| <b>Description:</b><br>The second word in the 4-word (64-bit) maximum velocity value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                       |       |               |               |

| 20CA.09h                                                                                                                                             | Max Velocity - Word 2 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                           | 0 - FFFFh             | DS3   | Read / Write  | No            |
| <b>Description:</b><br>The third word in the 4-word (64-bit) maximum velocity value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                       |       |               |               |

| 20CA.0Ah                                                                                                                                                        | Max Velocity - Word 3 |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                      | 0 - FFFFh             | DS3   | Read / Write  | No            |
| <b>Description:</b><br>The most significant word in the 4-word (64-bit) maximum velocity value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                       |       |               |               |

| 20CA.0Bh                                                                                                                                                             | Max Acceleration - Word 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - FFFFh                 | DA5   | Read / Write  | No            |
| <b>Description:</b><br>The least significant word in the 2-word (32-bit) maximum acceleration value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                           |       |               |               |

| 20CA.0Ch                                                                                                                                                            | Max Acceleration - Word 1 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - FFFFh                 | DA5   | Read / Write  | No            |
| <b>Description:</b><br>The most significant word in the 2-word (32-bit) maximum acceleration value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                           |       |               |               |

| 20CA.0Dh                                                                                                                                                             | Max Deceleration - Word 0 |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                            | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                           | 0 - FFFFh                 | DA5   | Read / Write  | No            |
| <b>Description:</b><br>The least significant word in the 2-word (32-bit) maximum deceleration value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                           |       |               |               |

| 20CA.0Eh                                                                                                                                                            | Max Deceleration - Word 1 |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                           | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                          | 0 - FFFFh                 | DA5   | Read / Write  | No            |
| <b>Description:</b><br>The most significant word in the 2-word (32-bit) maximum deceleration value. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                           |       |               |               |

| 20CA.0Fh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | -          | -     | -             | No            |

| 20CA.10h                                                                                                                   | Dynamic Index Confirmation Code |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                 | N/A                             | N/A   | Read / Write  | No            |
| <b>Description:</b><br>A value of 1000h must be written to this index when initiating dynamic indexes via network command. |                                 |       |               |               |

| 20CA.11h -<br>20CA.1Ch | Reserved   |       |               |               |
|------------------------|------------|-------|---------------|---------------|
| Data Type              | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16             | -          | -     | -             | No            |



## 2.4.4 Monitor Objects

### 6041h: StatusWord

| 6041h                                                                                                                                                                                                                                | StatusWord             |                                                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                            | Data Range             | Units                                             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                           | 0 - 65535              | N/A                                               | Read Only     | No            |
| <b>Description:</b><br>The StatusWord is used to determine which state the drive is in. "Drive States" on page 36 explains each drive's state and the StatusWord bit definitions. Below is a table of the hex values for each state. |                        |                                                   |               |               |
| Value                                                                                                                                                                                                                                | State                  | Description                                       |               |               |
| xxxx xxxx x0xx 0000                                                                                                                                                                                                                  | Not Ready to Switch On | Drive is initializing, drive is disabled          |               |               |
| xxxx xxxx x1xx 0000                                                                                                                                                                                                                  | Switch On Disabled     | Drive completed initialization, drive is disabled |               |               |
| xxxx xxxx x01x 0001                                                                                                                                                                                                                  | Ready to Switch On     | Bus power may be applied, drive is disabled       |               |               |
| xxxx xxxx x01x 0011                                                                                                                                                                                                                  | Switched On            | Bus power is applied, drive is disabled           |               |               |
| xxxx xxxx x01x 0111                                                                                                                                                                                                                  | Operation Enabled      | Drive is enabled                                  |               |               |
| xxxx xxxx x0xx 1111                                                                                                                                                                                                                  | Fault Reaction Active  | Drive will execute fault reaction event           |               |               |
| xxxx xxxx x0xx 1000                                                                                                                                                                                                                  | Fault                  | Drive is in the fault state                       |               |               |
| xxxx xxxx x00x 0111                                                                                                                                                                                                                  | Stop Active            | Stop received from host and now in this state     |               |               |

### 20ECh: NMT State

| 20EC.01h                                                                                                | NMT State     |       |               |               |
|---------------------------------------------------------------------------------------------------------|---------------|-------|---------------|---------------|
| Data Type                                                                                               | Data Range    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 – [2(16)-1] | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains the NMT State. For more information, see "NMT Error Control" on page 7. |               |       |               |               |

### 2002h: Drive Status

| 2002.01h                                                                      | Drive Bridge Status |       |               |               |
|-------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                     | Data Range          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                    | N/A                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in Table 2.12 below. |                     |       |               |               |

| 2002.02h                                                                      | Drive Protection Status |       |               |               |
|-------------------------------------------------------------------------------|-------------------------|-------|---------------|---------------|
| Data Type                                                                     | Data Range              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                    | N/A                     | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in Table 2.12 below. |                         |       |               |               |

| 2002.03h                                                                                      | System Protection Status |       |               |               |
|-----------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | N/A                      | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in <a href="#">Table 2.12</a> below. |                          |       |               |               |

| 2002.04h                                                                                      | Drive/System Status 1 |       |               |               |
|-----------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | N/A                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in <a href="#">Table 2.12</a> below. |                       |       |               |               |

| 2002.05h                                                                                      | Drive/System Status 2 |       |               |               |
|-----------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | N/A                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in <a href="#">Table 2.12</a> below. |                       |       |               |               |

| 2002.06h                                                                                      | Drive/System Status 3 |       |               |               |
|-----------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | N/A                   | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in <a href="#">Table 2.12</a> below. |                       |       |               |               |

| 2002.07h                                                                                      | Active Configuration Status |       |               |               |
|-----------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | N/A                         | N/A   | Read Only     | No            |
| <b>Description:</b><br>The function of each bit is given in <a href="#">Table 2.12</a> below. |                             |       |               |               |

**TABLE 2.12 Drive Status bit-field definitions**

| Bit | Drive Bridge Status            | Drive Protection Status | System Protection Status    | Drive System Status 1       | Drive System Status 2          | Drive System Status 3    | Active Configuration Status |
|-----|--------------------------------|-------------------------|-----------------------------|-----------------------------|--------------------------------|--------------------------|-----------------------------|
| 0   | Bridge Enabled                 | Drive Reset             | Parameter Restore Error     | Log Entry Missed            | Zero Velocity                  | Reserved                 | Absolute Position Valid     |
| 1   | Dynamic Brake Enabled          | Drive Internal Error    | Parameter Store Error       | Software Disable            | At Command                     | Reserved                 | Positive Stop Active        |
| 2   | Stop Enabled                   | Short Circuit           | Invalid Hall State          | User Disable                | Velocity Following Error       | Reserved                 | Negative Stop Active        |
| 3   | Positive Stop Enabled          | Over Current            | Phase Sync. Error           | User Positive Inhibit       | Positive Target Velocity Limit | Reserved                 | Reserved                    |
| 4   | Negative Stop Enabled          | Under Voltage           | Motor Over Temperature      | User Negative Inhibit       | Negative Target Velocity Limit | Reserved                 | Reserved                    |
| 5   | Positive Torque Inhibit Active | Over Voltage            | Phase Detection Fault       | Current Limiting            | Command Limiter Active         | Reserved                 | Reserved                    |
| 6   | Negative Torque Inhibit Active | Drive Over Temperature  | Feedback Sensor Error       | Continuous Current Foldback | In Home Position               | Commanded Stop           | Reserved                    |
| 7   | External Brake Active          | Reserved                | Motor Over Speed            | Current Loop Saturated      | Position Following Error       | User Stop                | Reserved                    |
| 8   | Reserved                       | Reserved                | Max Measured Position       | User Under Voltage          | Max Target Position Limit      | Capture 1 Active         | Reserved                    |
| 9   | Reserved                       | Reserved                | Min Measured Position       | User Over Voltage           | Min Target Position Limit      | Capture 2 Active         | Reserved                    |
| 10  | Reserved                       | Reserved                | Comm. Error (Node Guarding) | Non-sinusoidal Commutation  | Set Position                   | Capture 3 Active         | Reserved                    |
| 11  | Reserved                       | Reserved                | PWM Input Broken Wire       | Phase Detect Active         | Reserved                       | Commanded Positive Limit | Reserved                    |
| 12  | Reserved                       | Reserved                | Motion Engine Error         | Motion Engine Active        | Homing Active                  | Commanded Negative Limit | Reserved                    |
| 13  | Reserved                       | Reserved                | Motion Engine Abort         | User Auxiliary Disable      | Safe Torque Off Status         | Reserved                 | Reserved                    |
| 14  | Reserved                       | Reserved                | Reserved                    | Shunt Regulator             | Homing Complete                | Reserved                 | Reserved                    |
| 15  | Reserved                       | Reserved                | Reserved                    | Phase Detect Done           | Zero Position Error            | Reserved                 | Reserved                    |

**2003h: Drive Status History**

| 2003.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Drive Bridge Status History |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                         | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h.<br><br>*Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit. |                             |       |               |               |

| 2003.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Drive Protection Status History |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                             | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h.<br><br>*Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit. |                                 |       |               |               |

| 2003.03h                                                                                                                                                                                                                                                                                                                                                                                                                                                      | System Protection Status History |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                              | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h.<br><br>*Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit. |                                  |       |               |               |

| 2003.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Drive/System Status 1 History |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                           | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h.<br><br>*Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit. |                               |       |               |               |

| 2003.05h                                                                                                                                                                                                                                                                                                                                         | Drive/System Status 2 History |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                        | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                       | N/A                           | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h. |                               |       |               |               |
| *Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit.                                                                                                                                                                                                                                            |                               |       |               |               |

| 2003.06h                                                                                                                                                                                                                                                                                                                                         | Drive/System Status 3 History |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                        | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                       | N/A                           | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h. |                               |       |               |               |
| *Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit.                                                                                                                                                                                                                                            |                               |       |               |               |

| 2003.07h                                                                                                                                                                                                                                                                                                                                         | Active Configuration Status History |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                                                                                                                       | N/A                                 | N/A   | Read Only*    | No            |
| <b>Description:</b><br>If an event becomes active and then becomes inactive, Drive Status History will mark the event with a history bit. If a bit is 1, that event has occurred sometime in the past; 0 indicates the event has never occurred since power-up. The function of each bit is given in <a href="#">Table 2.12</a> of object 2002h. |                                     |       |               |               |
| *Features a Read / Write function, in that any history bit can be cleared by writing a 1 to that bit.                                                                                                                                                                                                                                            |                                     |       |               |               |

**2029h: Motion Engine Status**

| 2029.01h                                                                                        | Active Sequence |       |               |               |
|-------------------------------------------------------------------------------------------------|-----------------|-------|---------------|---------------|
| Data Type                                                                                       | Data Range      | Units | Accessibility | Stored to NVM |
| N/A                                                                                             | -2 - 15         | N/A   | Read Only     | No            |
| <b>Description:</b><br>Displays the active sequence number when using motion engine sequencing. |                 |       |               |               |
| <b>Bits 0:7</b><br>0-15 for index 0 to 15<br>FE: Dynamic Index<br>FF: No Invalid Index          |                 |       |               |               |
| <b>Bits 8:15</b><br>Reserved                                                                    |                 |       |               |               |

| 2029.02h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| N/A       |            |       | Read Only     | No            |

| 2029.03h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| N/A       |            |       | Read Only     | No            |

| 2029.04h                                                               | Motion Engine Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------------|-------|---------------------|---|----------|---|----------------------------------------------------------------------------|---|-----------------------------------------------|---|---------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------|---|---------------------------------------------|---|--------------------|---|--------------------|---|-----------|---|--------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------|----|--------------------------------------------------------------------|----|---------------------------------------------------------|----|-----------------------------------------------------------------------|----|--------------------|
| Data Type                                                              | Data Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Units | Accessibility | Stored to NVM |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| N/A                                                                    | 0 - 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A   | Read Only     | No            |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| <b>Description:</b><br>Defines the present state of the motion engine. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
|                                                                        | <table><tr><th>Value</th><th>Motion Engine State</th></tr><tr><td>0</td><td>Inactive</td></tr><tr><td>1</td><td>Waiting for Motion Start (Motion Engine is enabled and ready for an index)</td></tr><tr><td>2</td><td>Executing Motion (Index is currently running)</td></tr><tr><td>3</td><td>Program Load in Progress (Motion Engine is not ready for commanded index)</td></tr><tr><td>4</td><td>Program Load Failure - CRC Error (Problem loading Index. Must reset Motion Engine to continue)</td></tr><tr><td>5</td><td>Halt Asserted (Motion has been interrupted)</td></tr><tr><td>6</td><td>Single Step Active</td></tr><tr><td>7</td><td>Break Point Active</td></tr><tr><td>8</td><td>No Errors</td></tr><tr><td>9</td><td>Invalid Data Parameter (Problem loading Index. Must reset Motion Engine to continue)</td></tr><tr><td>10</td><td>Invalid Op-Code (Problem loading Index. Must reset Motion Engine to continue)</td></tr><tr><td>11</td><td>Invalid Op-code for Dynamic Motion (Problem with index parameters)</td></tr><tr><td>12</td><td>Invalid Reference Frame (Problem with index parameters)</td></tr><tr><td>13</td><td>Invalid Bridge State (Bridge must be enabled to begin indexed motion)</td></tr><tr><td>14</td><td>User Defined Fault</td></tr></table> |       |               |               | Value | Motion Engine State | 0 | Inactive | 1 | Waiting for Motion Start (Motion Engine is enabled and ready for an index) | 2 | Executing Motion (Index is currently running) | 3 | Program Load in Progress (Motion Engine is not ready for commanded index) | 4 | Program Load Failure - CRC Error (Problem loading Index. Must reset Motion Engine to continue) | 5 | Halt Asserted (Motion has been interrupted) | 6 | Single Step Active | 7 | Break Point Active | 8 | No Errors | 9 | Invalid Data Parameter (Problem loading Index. Must reset Motion Engine to continue) | 10 | Invalid Op-Code (Problem loading Index. Must reset Motion Engine to continue) | 11 | Invalid Op-code for Dynamic Motion (Problem with index parameters) | 12 | Invalid Reference Frame (Problem with index parameters) | 13 | Invalid Bridge State (Bridge must be enabled to begin indexed motion) | 14 | User Defined Fault |
| Value                                                                  | Motion Engine State                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 0                                                                      | Inactive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 1                                                                      | Waiting for Motion Start (Motion Engine is enabled and ready for an index)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 2                                                                      | Executing Motion (Index is currently running)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 3                                                                      | Program Load in Progress (Motion Engine is not ready for commanded index)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 4                                                                      | Program Load Failure - CRC Error (Problem loading Index. Must reset Motion Engine to continue)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 5                                                                      | Halt Asserted (Motion has been interrupted)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 6                                                                      | Single Step Active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 7                                                                      | Break Point Active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 8                                                                      | No Errors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 9                                                                      | Invalid Data Parameter (Problem loading Index. Must reset Motion Engine to continue)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 10                                                                     | Invalid Op-Code (Problem loading Index. Must reset Motion Engine to continue)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 11                                                                     | Invalid Op-code for Dynamic Motion (Problem with index parameters)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 12                                                                     | Invalid Reference Frame (Problem with index parameters)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 13                                                                     | Invalid Bridge State (Bridge must be enabled to begin indexed motion)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |
| 14                                                                     | User Defined Fault                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |               |       |                     |   |          |   |                                                                            |   |                                               |   |                                                                           |   |                                                                                                |   |                                             |   |                    |   |                    |   |           |   |                                                                                      |    |                                                                               |    |                                                                    |    |                                                         |    |                                                                       |    |                    |

### 6061h: Modes Of Operation Display

| 6061h      | Modes Of Operation Display |       |               |               |
|------------|----------------------------|-------|---------------|---------------|
| Data Type  | Data Range                 | Units | Accessibility | Stored to NVM |
| Unsigned16 | -128 - 127                 | N/A   | Read Only     | No            |

**Description:**  
A "Mode Of Operation" refers to how the drive's internal control loops are configured. ["Modes of Operation" on page 49](#) explains the valid control loop configurations for an AMC CANopen servo drive.

| Value | Operation Mode                     |
|-------|------------------------------------|
| 1     | Profile Position Mode              |
| 3     | Profile Velocity Mode              |
| 4     | Profile Torque Mode (current mode) |
| 6     | Homing Mode                        |
| 8     | Cyclic Synchronous Position Mode   |
| 9     | Cyclic Synchronous Velocity Mode   |
| A     | Cyclic Synchronous Torque Mode     |
| FF    | Custom Configured Modes            |

**200Eh: Feedback Sensor Values**

| 200E.01h                                                                                | Electrical Cycle Position      |        |               |               |
|-----------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                               | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the electrical cycle position. |                                |        |               |               |

| 200E.02h                                                                                                                           | Latched Encoder Position       |        |               |               |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                          | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                          | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the encoder position read when a capture edge occurs during phase detect. |                                |        |               |               |

| 200E.03h                                                                       | Phase Sync Error               |        |               |               |
|--------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                      | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                      | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     |               |
| <b>Description:</b><br>Contains a value corresponding to the phase sync error. |                                |        |               |               |

| 200E.04h                                                                         | Present Hall State   |       |               |               |
|----------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                        | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                       | $0 - [2^{(16)} - 1]$ | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the present Hall state. |                      |       |               |               |

| 200E.05h                                                                   | Stator Angle         |       |               |               |
|----------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                  | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                 | $0 - [2^{(16)} - 1]$ | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the stator angle. |                      |       |               |               |

| 200E.06h                                                                  | Rotor Angle          |       |               |               |
|---------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                 | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                | $0 - [2^{(16)} - 1]$ | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the rotor angle. |                      |       |               |               |



| 200E.07h                                                                                    | Stator Frequency     |          |               |               |
|---------------------------------------------------------------------------------------------|----------------------|----------|---------------|---------------|
| Data Type                                                                                   | Data Range           | Units    | Accessibility | Stored to NVM |
| Integer16                                                                                   | $0 - [2^{(15)} - 1]$ | e.c./min | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the stator frequency of the motor. |                      |          |               |               |

| 200E.08h                                                                                   | Rotor Frequency      |          |               |               |
|--------------------------------------------------------------------------------------------|----------------------|----------|---------------|---------------|
| Data Type                                                                                  | Data Range           | Units    | Accessibility | Stored to NVM |
| Integer16                                                                                  | $0 - [2^{(15)} - 1]$ | e.c./min | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the rotor frequency of the motor. |                      |          |               |               |

| 200E.09h                                                                                    | Cumulative Commutation Counts |        |               |               |
|---------------------------------------------------------------------------------------------|-------------------------------|--------|---------------|---------------|
| Data Type                                                                                   | Data Range                    | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                   | $0 - [2^{(31)} - 1]$          | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the cumulative commutation counts. |                               |        |               |               |

| 200E.0Ah                                                                                         | Captured Electrical Cycle Position |        |               |               |
|--------------------------------------------------------------------------------------------------|------------------------------------|--------|---------------|---------------|
| Data Type                                                                                        | Data Range                         | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                        | $[-2^{(31)}] - [2^{(31)} - 1]$     | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the captured electrical cycle position. |                                    |        |               |               |

| 200E.0Bh                                                                            | Phase Sync Adjustment          |        |               |               |
|-------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                           | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                           | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the phase sync adjustment. |                                |        |               |               |

| 200E.0Ch                                                                          | Step Cycle Position            |        |               |               |
|-----------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                         | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                         | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the step cycle position. |                                |        |               |               |

| 200E.0Dh                                                                                                                                                                 | Estimated Drive Current in Phase 1 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                         | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$     | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the estimated drive current in phase 1. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                    |       |               |               |

| 200E.0Eh                                                                                                                                                                     | Estimated Generated Current in Phase 1 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                             | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                    | $[-2^{(31)}] - [2^{(31)} - 1]$         | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the estimated generated current in phase 1. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                        |       |               |               |

| 200E.0Fh                                                                                                                                                                 | Estimated Drive Current in Phase 2 |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                         | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                | $[-2^{(31)}] - [2^{(31)} - 1]$     | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the estimated drive current in phase 2. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                    |       |               |               |

| 200E.10h                                                                                                                                                                     | Estimated Generated Current in Phase 2 |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                    | Data Range                             | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                    | $[-2^{(31)}] - [2^{(31)} - 1]$         | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the estimated generated current in phase 2. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                                        |       |               |               |

| 200E.11h                                                                                                                         | Local Error Raw                |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                        | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer16                                                                                                                        | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the position error before active damping is applied for stepper motors. |                                |        |               |               |

| 200E.12h                                                                                                                        | Local Error Filtered           |        |               |               |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                       | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer16                                                                                                                       | $[-2^{(31)}] - [2^{(31)} - 1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the position error after active damping is applied for stepper motors. |                                |        |               |               |

**2027h: Feedback Hardware Diagnostics**

| 2027.01h                                                                                                                                                                                                                                       | Sin/Cos Encoder Sine         |             |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                      | Data Range                   | Units       | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                      | $[-2^{(15)}] - [2^{(15)}-1]$ | Volts (SF1) | Read Only     | No            |
| <b>Description:</b><br>Represents the differential voltage of the +/- sine input of a 1V peak-to-peak encoder. Only applicable to drives that support Sin/Cos encoders. See <a href="#">"Appendix" on page 337</a> for information on scaling. |                              |             |               |               |

| 2027.02h                                                                                                                                                                                                                                         | Sin/Cos Encoder Cosine       |             |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                        | Data Range                   | Units       | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                        | $[-2^{(15)}] - [2^{(15)}-1]$ | Volts (SF1) | Read Only     | No            |
| <b>Description:</b><br>Represents the differential voltage of the +/- cosine input of a 1V peak-to-peak encoder. Only applicable to drives that support Sin/Cos encoders. See <a href="#">"Appendix" on page 337</a> for information on scaling. |                              |             |               |               |

| 2027.03h                                                                                                                                                                                                                                                                                                        | Sin/Cos Encoder Health       |             |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                       | Data Range                   | Units       | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                       | $[-2^{(15)}] - [2^{(15)}-1]$ | Volts (SF1) | Read Only     | No            |
| <b>Description:</b><br>Represents the health of the Sin/Cos encoder inputs according the formula below, where a value closer to 1 is healthy and a value closer to 0 is unhealthy. See <a href="#">"Appendix" on page 337</a> for information on scaling.<br><br>Encoder Health = $\text{Sin}^2 + \text{Cos}^2$ |                              |             |               |               |

| 2027.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Absolute Encoder Fault Word 1                          |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------|---------------|---------------|--------------|-------------|-----|--------------|-----|-----------------------------------------|-----|---------------------------------|-----|--------------------------------|-----|-------------------------------|-----|----------------------------------------------|-----|-------------------------|------|------------------------|-----|------------------|-----|--------------|-----|---------------------------------------|-----|----------------------|-----|-------------------------------------|-----|-----------------------------------------------|-----|----------------------------------------------------|-----|-------------------|-----|------------------------------------------------|-----|-------------------------------------------|-----|-----------------------------------|-----|------------------------------------------------|-----|--------------------------|-----|------------------------------|-----|---------------------------------------------------|-----|---------------------------------------|-----|----------------------------|-----|----------------------------|-----|----------------------------|-----|--------------------------------------------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Range                                             | Units | Accessibility | Stored to NVM |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| Integer16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 – [2 <sup>(16)</sup> – 1]                            | N/A   | Read Only     | No            |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| <b>Description:</b><br>Contains a value that corresponds to an absolute encoder fault code. Fault codes are listed below by encoder type. The drive checks for faults and attempts to clear them during a phase detection routine. If a fault cannot be cleared, the appropriate fault code will be given by this sub-index and the drive will activate a feedback sensor error.<br>Hiperface (Stegmann):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                        |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| <table><tr><th>Status Value</th><th>Status Name</th></tr><tr><td>00h</td><td>No Error</td></tr><tr><td>01h</td><td>Analog signals outside of specification</td></tr><tr><td>02h</td><td>Internal angle offset erroneous</td></tr><tr><td>03h</td><td>Data field partition destroyed</td></tr><tr><td>04h</td><td>Analog limit is not available</td></tr><tr><td>05h</td><td>Internal I<sup>2</sup>C is not serviceable</td></tr><tr><td>06h</td><td>Internal checksum error</td></tr><tr><td>07h</td><td>Encoder reset occurred</td></tr><tr><td>08h</td><td>Counter overflow</td></tr><tr><td>09h</td><td>Parity error</td></tr><tr><td>0Ah</td><td>Checksum of transmitted data is wrong</td></tr><tr><td>0Bh</td><td>Unknown command code</td></tr><tr><td>0Ch</td><td>Number of data transmitted is wrong</td></tr><tr><td>0Dh</td><td>Command argument transmitted is impermissible</td></tr><tr><td>0Eh</td><td>Data may not be written to the data field selected</td></tr><tr><td>0Fh</td><td>Wrong access code</td></tr><tr><td>10h</td><td>Size of specified data field cannot be changed</td></tr><tr><td>11h</td><td>Specified word address outside data field</td></tr><tr><td>12h</td><td>Access to non-existent data field</td></tr><tr><td>1Ch</td><td>Monitoring the magnitude of the analog signals</td></tr><tr><td>1Dh</td><td>Critical encoder current</td></tr><tr><td>1Eh</td><td>Critical encoder temperature</td></tr><tr><td>1Fh</td><td>Speed too high, position information not possible</td></tr><tr><td>20h</td><td>Position of single turn impermissible</td></tr><tr><td>21h</td><td>Position error, multi-turn</td></tr><tr><td>22h</td><td>Position error, multi-turn</td></tr><tr><td>23h</td><td>Position error, multi-turn</td></tr><tr><td>28h</td><td>Error absolute value formation linear measuring system</td></tr></table> |                                                        |       |               |               | Status Value | Status Name | 00h | No Error     | 01h | Analog signals outside of specification | 02h | Internal angle offset erroneous | 03h | Data field partition destroyed | 04h | Analog limit is not available | 05h | Internal I <sup>2</sup> C is not serviceable | 06h | Internal checksum error | 07h  | Encoder reset occurred | 08h | Counter overflow | 09h | Parity error | 0Ah | Checksum of transmitted data is wrong | 0Bh | Unknown command code | 0Ch | Number of data transmitted is wrong | 0Dh | Command argument transmitted is impermissible | 0Eh | Data may not be written to the data field selected | 0Fh | Wrong access code | 10h | Size of specified data field cannot be changed | 11h | Specified word address outside data field | 12h | Access to non-existent data field | 1Ch | Monitoring the magnitude of the analog signals | 1Dh | Critical encoder current | 1Eh | Critical encoder temperature | 1Fh | Speed too high, position information not possible | 20h | Position of single turn impermissible | 21h | Position error, multi-turn | 22h | Position error, multi-turn | 23h | Position error, multi-turn | 28h | Error absolute value formation linear measuring system |
| Status Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Status Name                                            |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 00h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No Error                                               |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Analog signals outside of specification                |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Internal angle offset erroneous                        |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 03h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data field partition destroyed                         |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Analog limit is not available                          |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 05h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Internal I <sup>2</sup> C is not serviceable           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 06h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Internal checksum error                                |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 07h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Encoder reset occurred                                 |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 08h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Counter overflow                                       |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 09h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Parity error                                           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Ah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Checksum of transmitted data is wrong                  |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Bh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Unknown command code                                   |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Number of data transmitted is wrong                    |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Dh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Command argument transmitted is impermissible          |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Eh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data may not be written to the data field selected     |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0Fh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Wrong access code                                      |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 10h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Size of specified data field cannot be changed         |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 11h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Specified word address outside data field              |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 12h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Access to non-existent data field                      |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 1Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Monitoring the magnitude of the analog signals         |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 1Dh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Critical encoder current                               |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 1Eh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Critical encoder temperature                           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 1Fh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Speed too high, position information not possible      |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 20h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Position of single turn impermissible                  |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 21h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Position error, multi-turn                             |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 22h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Position error, multi-turn                             |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 23h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Position error, multi-turn                             |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 28h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Error absolute value formation linear measuring system |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| EnDat (Heidenhein):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                        |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| <table><tr><th>Bit</th><th>Fault Name</th></tr><tr><td>0</td><td>Light Source</td></tr><tr><td>1</td><td>Signal Amplitude</td></tr><tr><td>2</td><td>Position Value</td></tr><tr><td>3</td><td>Over Voltage</td></tr><tr><td>4</td><td>Under Voltage</td></tr><tr><td>5</td><td>Over Current</td></tr><tr><td>6</td><td>Battery</td></tr><tr><td>7-15</td><td>RFU</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                        |       |               |               | Bit          | Fault Name  | 0   | Light Source | 1   | Signal Amplitude                        | 2   | Position Value                  | 3   | Over Voltage                   | 4   | Under Voltage                 | 5   | Over Current                                 | 6   | Battery                 | 7-15 | RFU                    |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Fault Name                                             |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Light Source                                           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Signal Amplitude                                       |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Position Value                                         |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Over Voltage                                           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Under Voltage                                          |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Over Current                                           |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Battery                                                |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |
| 7-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RFU                                                    |       |               |               |              |             |     |              |     |                                         |     |                                 |     |                                |     |                               |     |                                              |     |                         |      |                        |     |                  |     |              |     |                                       |     |                      |     |                                     |     |                                               |     |                                                    |     |                   |     |                                                |     |                                           |     |                                   |     |                                                |     |                          |     |                              |     |                                                   |     |                                       |     |                            |     |                            |     |                            |     |                                                        |

| 2027.05h  | Reserved             |       |               |               |
|-----------|----------------------|-------|---------------|---------------|
| Data Type | Data Range           | Units | Accessibility | Stored to NVM |
| Integer16 | $0 - [2^{(16)} - 1]$ | N/A   | Read Only     | No            |

| 2027.06h  | Reserved             |       |               |               |
|-----------|----------------------|-------|---------------|---------------|
| Data Type | Data Range           | Units | Accessibility | Stored to NVM |
| Integer16 | $0 - [2^{(16)} - 1]$ | N/A   | Read Only     | No            |

### 201Ch: Gearing Values

| 201C.01h                                                                                                          | Gear Input                     |        |               |               |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------------|---------------|
| Data Type                                                                                                         | Data Range                     | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                         | $[-2^{(31)}] - [2^{(31)} - 1]$ | Counts | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the number of encoder counts sent to the gearing module. |                                |        |               |               |

| 201C.02h                                                                         | Present Gear Input Counts |       |               |               |
|----------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                        | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                       | $0 - [2^{(16)} - 1]$      | N/A   | Read Only     | No            |
| <b>Description:</b><br>Value corresponding to the denominator of the gear ratio. |                           |       |               |               |

| 201C.03h                                                                       | Present Gear Output Counts |       |               |               |
|--------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|
| Data Type                                                                      | Data Range                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                     | $0 - [2^{(16)} - 1]$       | N/A   | Read Only     | No            |
| <b>Description:</b><br>Value corresponding to the numerator of the gear ratio. |                            |       |               |               |

### 6077h: Actual Current

| 6077h                                                                                                                                            | Actual Current           |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                        | Data Range               | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                        | $-2^{15} - (2^{15} - 1)$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the instantaneous current applied to the motor. See <a href="#">"Appendix" on page 337</a> for units conversion. |                          |       |               |               |

**2230h: Current Monitor Configuration**

| 2230.01h                                                                                  | Current Monitor Configuration      |                                                                                                                                                                                                                                        |               |               |
|-------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                 | Data Range                         | Units                                                                                                                                                                                                                                  | Accessibility | Stored to NVM |
| Unsigned16                                                                                | N/A                                | N/A                                                                                                                                                                                                                                    | Read/Write    | Yes           |
| <b>Description:</b><br>Contains the bitfield detailing the Current Monitor Configuration. |                                    |                                                                                                                                                                                                                                        |               |               |
| Bits                                                                                      | Name                               | Description                                                                                                                                                                                                                            |               |               |
| 0                                                                                         | Enable Sustained Current Indicator | 0: Disabled (default)<br>1: Enabled                                                                                                                                                                                                    |               |               |
| 1                                                                                         | Enable High Current Indicator      | 0: Disabled (default)<br>1: Enabled                                                                                                                                                                                                    |               |               |
| 3-2                                                                                       | Reserved                           | Must be 0                                                                                                                                                                                                                              |               |               |
| 7-4                                                                                       | Current Monitor Source             | Specifies what currents are to be monitored: Valid Values<br>0: Torque Current, (Loop 1 measured current) - Default<br>1: Flux Producing Current, (Loop 2 measured current)<br>2: Drive Current, (Vector sum of the two loop currents) |               |               |
| 15-8                                                                                      | Reserved                           | Must be 0                                                                                                                                                                                                                              |               |               |

| 2230.02h                                                                                                                                                                                                         | Sustained Current Indicator Dwell Time |                   |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                        | Data Range                             | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                       | 0 - 60000                              | milliseconds (ms) | Read/Write    | Yes           |
| <b>Description:</b><br>Contains a value corresponding to the amount of time the measured current must be above the Sustained Current Indicator Enable Level before the Sustained Current Indicator is triggered. |                                        |                   |               |               |

| 2230.03h                                                                                               | Current Monitor Levels                    |                                                                                |               |               |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------|---------------|---------------|
| Data Type                                                                                              | Data Range                                | Units                                                                          | Accessibility | Stored to NVM |
| Structure                                                                                              | 0 – (2 <sup>16</sup> -1)                  | DC1                                                                            | Read/Write    | Yes           |
| <b>Description:</b><br>Contains a structure detailing the configuration of the Current Monitor Levels. |                                           |                                                                                |               |               |
| Offset                                                                                                 | Name                                      | Description                                                                    |               |               |
| 0                                                                                                      | High Current Indicator Enable Level       | The measured current value when the High Current Indicator Fault is triggered. |               |               |
| 1                                                                                                      | Sustained Current Indicator Enable Level  | The measured current value when the Sustained Current Indicator is triggered.  |               |               |
| 2                                                                                                      | Sustained Current Indicator Disable Level | The measured current value when the Sustained Current Indicator is cleared.    |               |               |

**606Ch: Actual Velocity**

| 606Ch                                                                                                                                                                                                    | Actual Velocity        |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                | Data Range             | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                | $-2^{31} - (2^{31}-1)$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Actual Velocity is defined as the measured velocity, after conditioning, used to close the drive's velocity loop. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                        |       |               |               |

**606Dh: Velocity Window**

| 606Dh                                                                                                                                                                                                                                                                                                                               | Velocity Window      |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                           | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned32                                                                                                                                                                                                                                                                                                                          | $0 - [2^{(16)} - 1]$ | Ct/s  | Read / Write  | Yes           |
| <b>Description:</b><br>The maximum allowed difference between the target velocity and the velocity actual value. Bit 10 of the statusword shall be set to 1 ( <i>target reached</i> ) when the difference between the target velocity and velocity actual value is within the velocity window longer than the velocity window time. |                      |       |               |               |

**606Fh: Zero Velocity Window**

| 606Fh                                                                                                                                                                                                                                | Zero Velocity Window |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                            | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                           | $0 - [2^{(16)} - 1]$ | Ct/s  | Read / Write  | No            |
| <b>Description:</b><br>Contains a value corresponding to the motor zero speed limit set in the drive. When the velocity of the motor reaches this value or lower, the drive will indicate that it has reached a zero speed position. |                      |       |               |               |

**6068h: Position at Command Time**

| 6068h                                                                                                                                                                                                                                      | Position at Command Time |                   |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                  | Data Range               | Units             | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                                 | $0 - [2^{(16)} - 1]$     | milliseconds (ms) | Read/Write    | No            |
| <b>Description:</b><br>Contains a value corresponding to the time that the position error must be within the In-position window value before the At Command event becomes active when the drive is in one of the supported position modes. |                          |                   |               |               |

**6069h: Velocity Sensor Actual Value**

| 6069h                                                                                                                                                                                                                                                                                                                     | Velocity Sensor Actual Value |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                                 | $-2^{31} - (2^{31}-1)$       | DS1   | Read Only     | No            |
| <b>Description:</b><br>The value read from this object is the velocity measured directly from the primary feedback device before filtering or conditioning is applied. To read the actual velocity value used by the velocity control loop, see "606Ch: Actual Velocity". See "Appendix" on page 337 for unit conversion. |                              |       |               |               |

**2010h: Current Values**

| 2010.01h                                                                               | Continuous Current Limit       |       |               |               |
|----------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                     | Units | Accessibility | Stored to NVM |
| Integer16                                                                              | $[-2^{(15)}] - [2^{(15)} - 1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the continuous current limit. |                                |       |               |               |

| 2010.02h                                                                        | Peak Current Limit   |       |               |               |
|---------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                       | Data Range           | Units | Accessibility | Stored to NVM |
| Integer16                                                                       | $0 - [2^{(16)} - 1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the peak current limit |                      |       |               |               |

| 2010.03h                                                                                                                                                | Current Pre-filtered Reference-Torque |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                               | Data Range                            | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                               | $[-2^{(31)}] - [2^{(31)} - 1]$        | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains the raw current command before filtering or an offset has been applied. See "Appendix" on page 337 for unit conversion. |                                       |       |               |               |

| 2010.04h                                                                                                                                                                                                                   | Torque Summation Offset        |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                  | Data Range                     | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                  | $[-2^{(31)}] - [2^{(31)} - 1]$ | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains the offset of the commanded current in the current loop. Contains the raw current command before filtering or an offset has been applied. See "Appendix" on page 337 for unit conversions. |                                |       |               |               |



| 2010.05h                                                                                                                                       | Current Target-Torque        |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                      | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                      | $[-2^{(31)}] - [2^{(31)}-1]$ | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the target current (torque producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.06h                                                                                                                                            | Current Demand-Torque        |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                           | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the demand current (torque-producing). See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2010.07h                                                                                                                                         | Current Measured-Torque      |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                        | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                        | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the measured current (torque producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.08h                                                                                                                                                                                                                                                                                                       | Current Error-Torque         |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                      | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                                                                                                                      | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the error between the target current and the measured current (torque-producing). This is equivalent to: demand current minus measured current. When the demand current is reached, the current error is zero. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2010.09h                                                                                                                                     | Current Target - Flux        |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                    | $[-2^{(31)}] - [2^{(31)}-1]$ | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the target current (flux producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Ah                                                                                                                                     | Current Demand - Flux        |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the demand current (flux producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Bh                                                                                                                                       | Current Measured - Flux      |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                      | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                      | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the measured current (flux producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Ch                                                                                                                                    | Current Error - Flux         |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                   | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                   | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the current error (flux producing). See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Dh                                                                                                                                             | Current Measured - Phase A   |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                            | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current measured in phase A. See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Eh                                                                                                                                             | Current Measured - Phase B   |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                            | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current measured in phase B. See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.0Fh                                                                                                                                             | Current Measured - Phase C   |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                            | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current measured in phase C. See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.10h                                                                                                                                             | Current Measured - Phase D   |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                            | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current measured in phase D. See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.11h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| Integer32 | N/A        | N/A   | Read Only     | No            |

| 2010.12h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| Integer32 | N/A        | N/A   | Read Only     | No            |

| 2010.13h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| Integer32 | N/A        | N/A   | Read Only     | No            |

| 2010.14h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
| Integer32 | N/A        | N/A   | Read Only     | No            |

| 2010.15h                                                                                                                                                                                      | Current Measured - Alpha     |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                     | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                     | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the first current value calculated from the transformation from the phase current reference frame. See <a href="#">"Appendix" on page 337</a> for conversion. |                              |       |               |               |

| 2010.16h                                                                                                                                                                                            | Current Measured - Beta      |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                           | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)}-1]$ | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains the second current value calculated from the transformation from the phase current reference frame. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2010.17h                                                                                                                                                                            | Current Target - Flux Reference |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                           | Data Range                      | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                           | $[-2^{(31)}] - [2^{(31)}-1]$    | DC2   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current target flux reference for AC induction motors. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                 |       |               |               |

| 2010.18h                                                                                                                                                                            | Current Demand - Flux Reference |       |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                           | Data Range                      | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                           | $[-2^{(15)}] - [2^{(15)}-1]$    | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current demand flux reference for AC induction motors. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                 |       |               |               |

| 2010.19h                                                                                                                                                                              | Current Measured - Flux Reference |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                             | Data Range                        | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                             | $[-2^{(15)}] - [2^{(15)}-1]$      | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current measured flux reference for AC induction motors. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                   |       |               |               |

| 2010.1Ah                                                                                                                                                                           | Current Error - Flux Reference |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                          | Data Range                     | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                          | $[-2^{(15)}] - [2^{(15)}-1]$   | DC1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current error flux reference for AC induction motors. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                                |       |               |               |

## 2011h: Velocity Values

| 2011.01h                                                                                                                                                 | Velocity Measured Pre-Filter |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the measured velocity before the feedback cutoff filter. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2011.02h                                                                                                                                                | Velocity Measured Post-Filter |       |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                               | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                               | $[-2^{(31)}] - [2^{(31)}-1]$  | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the measured velocity after the feedback cutoff filter. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                               |       |               |               |

| 2011.03h                                                                                                                                                        | Velocity Target              |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                       | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the current velocity target when the drive is in velocity mode. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2011.04h                                                                                                                                                        | Velocity Demand              |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                       | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                       | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the current velocity demand when the drive is in velocity mode. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2011.05h                                                                                                                                                                                                                                                                                                              | Velocity Loop Error          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                                             | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                                             | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the error between the target velocity and the measured velocity. This is equivalent to target velocity minus measured velocity. When the current commanded velocity is reached, the velocity loop error will be zero. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2011.06h                                                                                                                                                                 | Velocity Summation Input     |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the raw velocity command before filtering or an offset has been applied. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

| 2011.07h                                                                                                                                                   | Velocity Summation Offset    |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                  | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                  | $[-2^{(31)}] - [2^{(31)}-1]$ | DS1   | Read Only     | No            |
| <b>Description:</b><br>Contains the offset of the commanded velocity in the velocity loop. See <a href="#">"Appendix" on page 337</a> for unit conversion. |                              |       |               |               |

### 6064h: Actual Position

| 6064h                                                                                                                                                                                | Actual Position        |        |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                            | Data Range             | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                            | $-2^{31} - (2^{31}-1)$ | counts | Read Only     | No            |
| <b>Description:</b><br>Position Actual Value contains the measured position of the primary feedback device. This is the actual value used to create position error in position mode. |                        |        |               |               |

### 2012h: Position Values

| 2012.01h                                                                 | Position Measured            |        |               |               |
|--------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the current measured position in counts. |                              |        |               |               |

| 2012.02h                                                                                                    | Position Target              |        |               |               |
|-------------------------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                                   | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                   | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the current commanded position when the drive is used in the position mode. |                              |        |               |               |

| 2012.03h                                                               | Position Demand              |        |               |               |
|------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                              | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                              | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the current position demand in counts. |                              |        |               |               |

| 2012.04h                                                                                                                                                                                                                                                                                        | Position Loop Error          |        |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                                                                                                                       | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the error between the target position (in counts) and the measured position (in counts). This is equivalent to target position (counts) minus measured position (counts). When the current commanded position is reached, the position loop error will be zero. |                              |        |               |               |

| 2012.05h                                                                                                 | Position Summation Input     |        |               |               |
|----------------------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                                | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the raw position command before filtering or an offset has been applied. |                              |        |               |               |

| 2012.06h                                                                                   | Position Summation Offset    |        |               |               |
|--------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                  | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                  | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the offset of the commanded position in the position loop. |                              |        |               |               |

| 2012.07h                                                                                                                   | Position Index Capture Value |        |               |               |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                  | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                  | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the position of the last encoder index captured by the drive. Requires encoder with index. |                              |        |               |               |

**200Ch: PVT Quick Status**

| 200C.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PVT Quick Status                  |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|-----|------------------|-----|-----------------------------------|-----|----------|---|------------|---|------------|----|---------------|----|-----------------|----|----------------|----|---------------|----|------|----|---------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Data Range                        | Units | Accessibility | Stored to NVM |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0 – [2 <sup>(16)</sup> – 1]       | N/A   | Read Only     | No            |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| <b>Description:</b><br>Consolidates status information with regards to PVT. Bit definitions are given below.                                                                                                                                                                                                                                                                                                                                                                                         |                                   |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| <table><tr><th>Bit</th><th>PVT Drive Status</th></tr><tr><td>0-4</td><td>Number of PVT points in the drive</td></tr><tr><td>5-7</td><td>Reserved</td></tr><tr><td>8</td><td>Zero Speed</td></tr><tr><td>9</td><td>At Command</td></tr><tr><td>10</td><td>Homing Active</td></tr><tr><td>11</td><td>Homing Complete</td></tr><tr><td>12</td><td>Bridge Enabled</td></tr><tr><td>13</td><td>Brake Enabled</td></tr><tr><td>14</td><td>Stop</td></tr><tr><td>15</td><td>PVT Executing</td></tr></table> |                                   |       |               |               | Bit | PVT Drive Status | 0-4 | Number of PVT points in the drive | 5-7 | Reserved | 8 | Zero Speed | 9 | At Command | 10 | Homing Active | 11 | Homing Complete | 12 | Bridge Enabled | 13 | Brake Enabled | 14 | Stop | 15 | PVT Executing |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PVT Drive Status                  |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 0-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Number of PVT points in the drive |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 5-7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Reserved                          |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Zero Speed                        |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | At Command                        |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Homing Active                     |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Homing Complete                   |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Bridge Enabled                    |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Brake Enabled                     |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Stop                              |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PVT Executing                     |       |               |               |     |                  |     |                                   |     |          |   |            |   |            |    |               |    |                 |    |                |    |               |    |      |    |               |

**201Dh: PVT Status Values**

| 201D.01h                                                                                                                  | PVT Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------|---------------|---|-------------|------------------------|---|--------------|-------------------------|---|------------------|------------------------------------------|---|----------------|---------------------------------------|---|-------------------|----------------------------------------------------------|---|--------------------------|-----------------------------------------|---|----------------------|------------------------------------|--------|----------|-------------------------|
| Data Type                                                                                                                 | Data Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Units                                                    | Accessibility | Stored to NVM |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| Unsigned16                                                                                                                | See Table                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                                                      | Read Only     | No            |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| <b>Description:</b><br>A bit field corresponding to the current status of PVT. The bit field definitions are given below. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
|                                                                                                                           | <table><tr><th>Bit</th><th>PVT Status</th><th>Description</th></tr><tr><td>0</td><td>Buffer Full</td><td>The PVT Buffer is Full</td></tr><tr><td>1</td><td>Buffer Empty</td><td>The PVT Buffer is Empty</td></tr><tr><td>2</td><td>Buffer Threshold</td><td>The PVT Buffer has reached its threshold</td></tr><tr><td>3</td><td>Buffer Failure</td><td>Problem Reading Point from PVT Buffer</td></tr><tr><td>4</td><td>Buffer Empty Stop</td><td>The PVT Buffer is Empty, Last PVT Point has been reached</td></tr><tr><td>5</td><td>PVT point wrong sequence</td><td>A PVT Point Sequence Error has occurred</td></tr><tr><td>6</td><td>PVT Buffer Executing</td><td>The PVT Buffer is presently in use</td></tr><tr><td>7...15</td><td>Reserved</td><td>Reserved for future use</td></tr></table> | Bit                                                      | PVT Status    | Description   | 0 | Buffer Full | The PVT Buffer is Full | 1 | Buffer Empty | The PVT Buffer is Empty | 2 | Buffer Threshold | The PVT Buffer has reached its threshold | 3 | Buffer Failure | Problem Reading Point from PVT Buffer | 4 | Buffer Empty Stop | The PVT Buffer is Empty, Last PVT Point has been reached | 5 | PVT point wrong sequence | A PVT Point Sequence Error has occurred | 6 | PVT Buffer Executing | The PVT Buffer is presently in use | 7...15 | Reserved | Reserved for future use |
| Bit                                                                                                                       | PVT Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Description                                              |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 0                                                                                                                         | Buffer Full                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | The PVT Buffer is Full                                   |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 1                                                                                                                         | Buffer Empty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | The PVT Buffer is Empty                                  |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 2                                                                                                                         | Buffer Threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The PVT Buffer has reached its threshold                 |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 3                                                                                                                         | Buffer Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Problem Reading Point from PVT Buffer                    |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 4                                                                                                                         | Buffer Empty Stop                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | The PVT Buffer is Empty, Last PVT Point has been reached |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 5                                                                                                                         | PVT point wrong sequence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A PVT Point Sequence Error has occurred                  |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 6                                                                                                                         | PVT Buffer Executing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | The PVT Buffer is presently in use                       |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |
| 7...15                                                                                                                    | Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Reserved for future use                                  |               |               |   |             |                        |   |              |                         |   |                  |                                          |   |                |                                       |   |                   |                                                          |   |                          |                                         |   |                      |                                    |        |          |                         |



| 201D.02h                                                                                                                                                                                                                         | PVT Points Remaining |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                                        | Data Range           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                                                                                                                                       | 0 – 15               | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the number of PVT points remaining in the PVT buffer. This value gets decremented by 1 after each PVT point is executed. When it reaches zero, the PVT buffer is empty. |                      |       |               |               |

| 201D.03h                                                                                                                 | PVT Sequence Number |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|
| Data Type                                                                                                                | Data Range          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                               | 0 – 15              | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the current PVT point in the PVT buffer that is being executed. |                     |       |               |               |

| 201D.04h   |            | PVT Quick Status |               |               |
|------------|------------|------------------|---------------|---------------|
| Data Type  | Data Range | Units            | Accessibility | Stored to NVM |
| Unsigned16 | See Table  | N/A              | Read Only     | No            |

**Description:**  
A bit field corresponding various statuses used by Click&Move to maintain its PVT sequencer.

| Bit   | PVT Status          | Description                                                                  |
|-------|---------------------|------------------------------------------------------------------------------|
| 0...7 | Remaining Points    | Indicates the number of points left in the trajectory buffer                 |
| 6     | Zero Speed          | Indicates if the Drive's measured speed is within the zero velocity window   |
| 8     | At Command          | Indicates if the Drive's measured position is within the At Command window   |
| 10    | Homing Active       | Indicates that the homing algorithm is running                               |
| 11    | Homing Complete     | Indicates that the homing algorithm is complete                              |
| 12    | Bridge Enabled      | Indicates that the motor bridge is active and driving current                |
| 13    | Brake Enabled       | Indicates that the Drive's brake action is active                            |
| 14    | Quick Stop Active   | Indicates that the Drive's Quick Stop action is active                       |
| 15    | Sequencer Executing | Indicates that the PVT trajectory generator is sequencing through the points |

### 2014h: Command Limiter Input

| 2014.01h                                                                                   | Input Command                |       |               |               |
|--------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer32                                                                                  | $[-2^{(31)}] - [2^{(31)}-1]$ | N/A   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the input of the command limiter. |                              |       |               |               |

**200Fh: Power Bridge Values**

| 200F.01h                                                                                                                                      | DC Bus Voltage     |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------------|
| Data Type                                                                                                                                     | Data Range         | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                     | $0 - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the DC Bus Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                    |       |               |               |

| 200F.02h                                                                                                                                                     | Control Loop 1 Output Voltage |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$  | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Control Loop 1 Output Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                               |       |               |               |

| 200F.03h                                                                                                                                                     | Control Loop 2 Output Voltage |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                    | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$  | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Control Loop 2 Output Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                               |       |               |               |

| 200F.04h                                                                                                                                             | Ualpha Output Voltage        |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                            | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                            | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Ualpha Output Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                              |       |               |               |

| 200F.05h                                                                                                                                            | Ubeta Output Voltage         |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                           | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                           | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Ubeta Output Voltage. See <a href="#">"Appendix" on page 337</a> for unit conversions. |                              |       |               |               |

| 200F.06h                                                                                                                                                       | Trap Mode Output Voltage     |       |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                      | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                      | $[-2^{(15)}] - [2^{(15)}-1]$ | DPV   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the trap mode output voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.07h                                                                                                                                                     | Phase A Output Voltage       |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$ | DPV   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Phase A Output Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.08h                                                                                                                                                     | Phase B Output Voltage       |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$ | DPV   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Phase B Output Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.09h                                                                                                                                                     | Phase C Output Voltage       |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$ | DPV   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Phase C Output Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.0Ah                                                                                                                                                     | Phase D Output Voltage       |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                    | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                    | $[-2^{(15)}] - [2^{(15)}-1]$ | DPV   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Phase D Output Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.0Bh                                                                                                                                                  | Va Measured Voltage          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                 | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Va Measured Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.0Ch                                                                                                                                                  | Vb Measured Voltage          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                 | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Vb Measured Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.0Dh                                                                                                                                                  | Vc Measured Voltage          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                 | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Vc Measured Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

| 200F.0Eh                                                                                                                                                  | Vd Measured Voltage          |       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                 | $[-2^{(15)}] - [2^{(15)}-1]$ | DV1   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the Vd Measured Voltage. See <a href="#">“Appendix” on page 337</a> for unit conversion details. |                              |       |               |               |

**2023h: Digital I/O Values**

| 2023.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Digital Inputs (Post Active Level) |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|-----|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|------------------|----|------------------|----|------------------|----|------------------|----|------------------|----|------------------|----|------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                         | Units | Accessibility | Stored to NVM |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | See Table                          | N/A   | Read Only     | No            |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| <b>Description:</b><br>Bit field corresponding to the state of the digital inputs. Bit field definitions are given below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| <table><tr><th>Bit</th><th>Digital Inputs*</th></tr><tr><td>0</td><td>Digital Input 1</td></tr><tr><td>1</td><td>Digital Input 2</td></tr><tr><td>2</td><td>Digital Input 3</td></tr><tr><td>3</td><td>Digital Input 4</td></tr><tr><td>4</td><td>Digital Input 5</td></tr><tr><td>5</td><td>Digital Input 6</td></tr><tr><td>6</td><td>Digital Input 7</td></tr><tr><td>7</td><td>Digital Input 8</td></tr><tr><td>8</td><td>Digital Input 9</td></tr><tr><td>9</td><td>Digital Input 10</td></tr><tr><td>10</td><td>Digital Input 11</td></tr><tr><td>11</td><td>Digital Input 12</td></tr><tr><td>12</td><td>Digital Input 13</td></tr><tr><td>13</td><td>Digital Input 14</td></tr><tr><td>14</td><td>Digital Input 15</td></tr><tr><td>15</td><td>Digital Input 16</td></tr></table> |                                    |       |               |               | Bit | Digital Inputs* | 0 | Digital Input 1 | 1 | Digital Input 2 | 2 | Digital Input 3 | 3 | Digital Input 4 | 4 | Digital Input 5 | 5 | Digital Input 6 | 6 | Digital Input 7 | 7 | Digital Input 8 | 8 | Digital Input 9 | 9 | Digital Input 10 | 10 | Digital Input 11 | 11 | Digital Input 12 | 12 | Digital Input 13 | 13 | Digital Input 14 | 14 | Digital Input 15 | 15 | Digital Input 16 |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Digital Inputs*                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 1                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 2                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 3                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 4                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 5                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 6                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 7                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 8                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 9                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 10                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 11                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 12                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 13                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 14                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 15                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 16                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| *Number of actual inputs depends on drive model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |

| 2023.02h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Digital Inputs (Pre Active Level) |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|-----|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|-----------------|---|------------------|----|------------------|----|------------------|----|------------------|----|------------------|----|------------------|----|------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Data Range                        | Units | Accessibility | Stored to NVM |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | See Table                         | N/A   | Read Only     | No            |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| <b>Description:</b><br>Bit field corresponding to the current voltage level of the digital inputs. Bit field definitions are given below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| <table><tr><th>Bit</th><th>Digital Inputs*</th></tr><tr><td>0</td><td>Digital Input 1</td></tr><tr><td>1</td><td>Digital Input 2</td></tr><tr><td>2</td><td>Digital Input 3</td></tr><tr><td>3</td><td>Digital Input 4</td></tr><tr><td>4</td><td>Digital Input 5</td></tr><tr><td>5</td><td>Digital Input 6</td></tr><tr><td>6</td><td>Digital Input 7</td></tr><tr><td>7</td><td>Digital Input 8</td></tr><tr><td>8</td><td>Digital Input 9</td></tr><tr><td>9</td><td>Digital Input 10</td></tr><tr><td>10</td><td>Digital Input 11</td></tr><tr><td>11</td><td>Digital Input 12</td></tr><tr><td>12</td><td>Digital Input 13</td></tr><tr><td>13</td><td>Digital Input 14</td></tr><tr><td>14</td><td>Digital Input 15</td></tr><tr><td>15</td><td>Digital Input 16</td></tr></table> |                                   |       |               |               | Bit | Digital Inputs* | 0 | Digital Input 1 | 1 | Digital Input 2 | 2 | Digital Input 3 | 3 | Digital Input 4 | 4 | Digital Input 5 | 5 | Digital Input 6 | 6 | Digital Input 7 | 7 | Digital Input 8 | 8 | Digital Input 9 | 9 | Digital Input 10 | 10 | Digital Input 11 | 11 | Digital Input 12 | 12 | Digital Input 13 | 13 | Digital Input 14 | 14 | Digital Input 15 | 15 | Digital Input 16 |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Digital Inputs*                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 1                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 2                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 3                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 4                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 5                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 6                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 7                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 8                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 9                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Input 10                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 11                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 12                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 13                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 14                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 15                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Input 16                  |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |
| *Number of actual inputs depends on drive model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                   |       |               |               |     |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                 |   |                  |    |                  |    |                  |    |                  |    |                  |    |                  |    |                  |

| 2023.03h                                                                                                                                   | Digital Outputs (Post Active Level) |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|
| Data Type                                                                                                                                  | Data Range                          | Units | Accessibility | Stored to NVM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| Unsigned16                                                                                                                                 | See Table                           | N/A   | Read Only     | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| <b>Description:</b><br>Bit field corresponding to the current voltage level of the digital outputs. Bit field definitions are given below. |                                     |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
|                                                                                                                                            |                                     |       |               | <table><tr><th>Bit</th><th>Digital Outputs*</th></tr><tr><td>0</td><td>Digital Output 1</td></tr><tr><td>1</td><td>Digital Output 2</td></tr><tr><td>2</td><td>Digital Output 3</td></tr><tr><td>3</td><td>Digital Output 4</td></tr><tr><td>4</td><td>Digital Output 5</td></tr><tr><td>5</td><td>Digital Output 6</td></tr><tr><td>6</td><td>Digital Output 7</td></tr><tr><td>7</td><td>Digital Output 8</td></tr><tr><td>8</td><td>Digital Output 9</td></tr><tr><td>9</td><td>Digital Output 10</td></tr><tr><td>10</td><td>Digital Output 11</td></tr><tr><td>11</td><td>Digital Output 12</td></tr><tr><td>12</td><td>Digital Output 13</td></tr><tr><td>13</td><td>Digital Output 14</td></tr><tr><td>14</td><td>Digital Output 15</td></tr><tr><td>15</td><td>Digital Output 16</td></tr></table> | Bit | Digital Outputs* | 0 | Digital Output 1 | 1 | Digital Output 2 | 2 | Digital Output 3 | 3 | Digital Output 4 | 4 | Digital Output 5 | 5 | Digital Output 6 | 6 | Digital Output 7 | 7 | Digital Output 8 | 8 | Digital Output 9 | 9 | Digital Output 10 | 10 | Digital Output 11 | 11 | Digital Output 12 | 12 | Digital Output 13 | 13 | Digital Output 14 | 14 | Digital Output 15 | 15 | Digital Output 16 |
| Bit                                                                                                                                        | Digital Outputs*                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 0                                                                                                                                          | Digital Output 1                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 1                                                                                                                                          | Digital Output 2                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 2                                                                                                                                          | Digital Output 3                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 3                                                                                                                                          | Digital Output 4                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 4                                                                                                                                          | Digital Output 5                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 5                                                                                                                                          | Digital Output 6                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 6                                                                                                                                          | Digital Output 7                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 7                                                                                                                                          | Digital Output 8                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 8                                                                                                                                          | Digital Output 9                    |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 9                                                                                                                                          | Digital Output 10                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 10                                                                                                                                         | Digital Output 11                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 11                                                                                                                                         | Digital Output 12                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 12                                                                                                                                         | Digital Output 13                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 13                                                                                                                                         | Digital Output 14                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 14                                                                                                                                         | Digital Output 15                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 15                                                                                                                                         | Digital Output 16                   |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| *Number of actual outputs depends on drive model                                                                                           |                                     |       |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |

| 2023.04h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Digital Outputs (Pre Active Level) |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|-----|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                         | Units | Accessibility | Stored to NVM |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | See Table                          | N/A   | Read Only     | No            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| <b>Description:</b><br>Bit field corresponding to the state of the digital outputs. Bit field definitions are given below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| <table><tr><th>Bit</th><th>Digital Outputs*</th></tr><tr><td>0</td><td>Digital Output 1</td></tr><tr><td>1</td><td>Digital Output 2</td></tr><tr><td>2</td><td>Digital Output 3</td></tr><tr><td>3</td><td>Digital Output 4</td></tr><tr><td>4</td><td>Digital Output 5</td></tr><tr><td>5</td><td>Digital Output 6</td></tr><tr><td>6</td><td>Digital Output 7</td></tr><tr><td>7</td><td>Digital Output 8</td></tr><tr><td>8</td><td>Digital Output 9</td></tr><tr><td>9</td><td>Digital Output 10</td></tr><tr><td>10</td><td>Digital Output 11</td></tr><tr><td>11</td><td>Digital Output 12</td></tr><tr><td>12</td><td>Digital Output 13</td></tr><tr><td>13</td><td>Digital Output 14</td></tr><tr><td>14</td><td>Digital Output 15</td></tr><tr><td>15</td><td>Digital Output 16</td></tr></table> |                                    |       |               |               | Bit | Digital Outputs* | 0 | Digital Output 1 | 1 | Digital Output 2 | 2 | Digital Output 3 | 3 | Digital Output 4 | 4 | Digital Output 5 | 5 | Digital Output 6 | 6 | Digital Output 7 | 7 | Digital Output 8 | 8 | Digital Output 9 | 9 | Digital Output 10 | 10 | Digital Output 11 | 11 | Digital Output 12 | 12 | Digital Output 13 | 13 | Digital Output 14 | 14 | Digital Output 15 | 15 | Digital Output 16 |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Outputs*                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 1                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 2                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 3                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 4                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 5                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 6                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 7                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 8                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 9                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 10                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 11                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 12                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 13                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 14                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 15                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 16                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| *Number of actual outputs depends on drive model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |

| 2023.05h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
|           |            |       |               |               |

| 2023.06h  | Reserved   |       |               |               |
|-----------|------------|-------|---------------|---------------|
| Data Type | Data Range | Units | Accessibility | Stored to NVM |
|           |            |       |               |               |



**2024h: Digital Outputs**

| 2024.01h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Digital Outputs (Pre Active Level) |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|-----|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|------------------|---|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|----|-------------------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Data Range                         | Units | Accessibility | Stored to NVM |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| Unsigned16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | See Table                          | N/A   | Read Only     | No            |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| <b>Description:</b><br>Bit field corresponding to the state of the digital inputs. Bit field definitions are given below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| <table><tr><th>Bit</th><th>Digital Outputs*</th></tr><tr><td>1</td><td>Digital Output 1</td></tr><tr><td>1</td><td>Digital Output 2</td></tr><tr><td>2</td><td>Digital Output 3</td></tr><tr><td>3</td><td>Digital Output 4</td></tr><tr><td>4</td><td>Digital Output 5</td></tr><tr><td>5</td><td>Digital Output 6</td></tr><tr><td>6</td><td>Digital Output 7</td></tr><tr><td>7</td><td>Digital Output 8</td></tr><tr><td>8</td><td>Digital Output 9</td></tr><tr><td>9</td><td>Digital Output 10</td></tr><tr><td>10</td><td>Digital Output 11</td></tr><tr><td>11</td><td>Digital Output 12</td></tr><tr><td>12</td><td>Digital Output 13</td></tr><tr><td>13</td><td>Digital Output 14</td></tr><tr><td>14</td><td>Digital Output 15</td></tr><tr><td>15</td><td>Digital Output 16</td></tr></table> |                                    |       |               |               | Bit | Digital Outputs* | 1 | Digital Output 1 | 1 | Digital Output 2 | 2 | Digital Output 3 | 3 | Digital Output 4 | 4 | Digital Output 5 | 5 | Digital Output 6 | 6 | Digital Output 7 | 7 | Digital Output 8 | 8 | Digital Output 9 | 9 | Digital Output 10 | 10 | Digital Output 11 | 11 | Digital Output 12 | 12 | Digital Output 13 | 13 | Digital Output 14 | 14 | Digital Output 15 | 15 | Digital Output 16 |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Digital Outputs*                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 1                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 2                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 3                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 4                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 5                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 6                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 7                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 8                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 9                   |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Output 10                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 11                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 12                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 13                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 14                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 15                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Digital Output 16                  |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |
| *Number of actual outputs depends on drive model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    |       |               |               |     |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                  |   |                   |    |                   |    |                   |    |                   |    |                   |    |                   |    |                   |

**60FDh: Digital Inputs**

| 60FD.00h                                                                                                                                                                                                                                                                                                                                                                                                                                       | Digital Inputs      |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------|-----|-------|---|---------------------|---|---------------------|---|-------------|------|----------|----|--------------|----|------------------|----|-----------|----|-----------------|-------|----------|
| Data Type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data Range          | Units | Accessibility | Stored to NVM |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| Unsigned32                                                                                                                                                                                                                                                                                                                                                                                                                                     | N/A                 | N/A   | Read Only     | No            |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| <b>Description:</b><br>Contains the bitfield for the state of the digital input assigned to the following events.                                                                                                                                                                                                                                                                                                                              |                     |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| <table><tr><th>Bit</th><th>Event</th></tr><tr><td>0</td><td>User Negative Limit</td></tr><tr><td>1</td><td>User Positive Limit</td></tr><tr><td>2</td><td>Home Switch</td></tr><tr><td>3-15</td><td>Reserved</td></tr><tr><td>16</td><td>User Disable</td></tr><tr><td>17</td><td>User Aux Disable</td></tr><tr><td>18</td><td>User Stop</td></tr><tr><td>19</td><td>Motor Over-Temp</td></tr><tr><td>20-31</td><td>Reserved</td></tr></table> |                     |       |               |               | Bit | Event | 0 | User Negative Limit | 1 | User Positive Limit | 2 | Home Switch | 3-15 | Reserved | 16 | User Disable | 17 | User Aux Disable | 18 | User Stop | 19 | Motor Over-Temp | 20-31 | Reserved |
| Bit                                                                                                                                                                                                                                                                                                                                                                                                                                            | Event               |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                              | User Negative Limit |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                              | User Positive Limit |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                              | Home Switch         |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 3-15                                                                                                                                                                                                                                                                                                                                                                                                                                           | Reserved            |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                             | User Disable        |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 17                                                                                                                                                                                                                                                                                                                                                                                                                                             | User Aux Disable    |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 18                                                                                                                                                                                                                                                                                                                                                                                                                                             | User Stop           |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 19                                                                                                                                                                                                                                                                                                                                                                                                                                             | Motor Over-Temp     |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |
| 20-31                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reserved            |       |               |               |     |       |   |                     |   |                     |   |             |      |          |    |              |    |                  |    |           |    |                 |       |          |

**60FEh: Digital Outputs**

| 60FE.00h                                                                                                                          | Digital Outputs |       |               |               |     |       |   |              |      |          |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|---------------|---------------|-----|-------|---|--------------|------|----------|
| Data Type                                                                                                                         | Data Range      | Units | Accessibility | Stored to NVM |     |       |   |              |      |          |
| Unsigned32                                                                                                                        | N/A             | N/A   | Read / Write  | No            |     |       |   |              |      |          |
| <b>Description:</b><br>Contains the bitfield to trigger the digital output assigned to the following events.                      |                 |       |               |               |     |       |   |              |      |          |
| <table><tr><th>Bit</th><th>Event</th></tr><tr><td>0</td><td>Brake Active</td></tr><tr><td>1-31</td><td>Reserved</td></tr></table> |                 |       |               |               | Bit | Event | 0 | Brake Active | 1-31 | Reserved |
| Bit                                                                                                                               | Event           |       |               |               |     |       |   |              |      |          |
| 0                                                                                                                                 | Brake Active    |       |               |               |     |       |   |              |      |          |
| 1-31                                                                                                                              | Reserved        |       |               |               |     |       |   |              |      |          |

**201Ah: Analog Input Values**

| 201A.01h                                                                                                                                                                                                                                                                                        | Analog Input 1 Status       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|-----|-------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|------|----------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range                  | Units | Accessibility | Stored to NVM |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| Unsigned16                                                                                                                                                                                                                                                                                      | 0 – [2 <sup>(16)</sup> ]-1] | N/A   | Read Only     | No            |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <b>Description:</b><br>The internal status of the Analog Input 1 module.                                                                                                                                                                                                                        |                             |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>0</td><td>Upper Bound Exceeded</td></tr><tr><td>1</td><td>Lower Bound Exceeded</td></tr><tr><td>2</td><td>Upper Warning Active</td></tr><tr><td>3</td><td>Lower Warning Active</td></tr><tr><td>4-15</td><td>Reserved</td></tr></table> |                             |       |               |               | Bit | Description | 0 | Upper Bound Exceeded | 1 | Lower Bound Exceeded | 2 | Upper Warning Active | 3 | Lower Warning Active | 4-15 | Reserved |
| Bit                                                                                                                                                                                                                                                                                             | Description                 |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 0                                                                                                                                                                                                                                                                                               | Upper Bound Exceeded        |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 1                                                                                                                                                                                                                                                                                               | Lower Bound Exceeded        |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 2                                                                                                                                                                                                                                                                                               | Upper Warning Active        |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 3                                                                                                                                                                                                                                                                                               | Lower Warning Active        |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 4-15                                                                                                                                                                                                                                                                                            | Reserved                    |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |

| 201A.02h                                                      | Analog Input 1 Raw ADC Value |       |               |               |
|---------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                     | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                    | $0 - [2^{(16)}-1]$           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The upper word of the Raw ADC 1 Value. |                              |       |               |               |

| 201A.03h                                                                               | Analog Input 1 Normalized Value 16bitS14 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer16                                                                              | $[-2^{(15)}] - [2^{(15)}-1]$             | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 1 result value normalized to +/-1 in 16bitS14 Notation. |                                          |       |               |               |

| 201A.04h                                                                               | Analog Input 1 Normalized Value 32bitS30 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                              | $0 - [2^{(31)}-1]$                       | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 1 result value normalized to +/-1 in 32bitS30 Notation. |                                          |       |               |               |

| 201A.05h                                                                                                                                                                                                                                                                                        | Analog Input 2 Status      |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|-----|-------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|------|----------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range                 | Units | Accessibility | Stored to NVM |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| Unsigned16                                                                                                                                                                                                                                                                                      | 0 – [2 <sup>(16)</sup> -1] | N/A   | Read Only     | No            |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <b>Description:</b><br>The internal status of the Analog Input 2 module.                                                                                                                                                                                                                        |                            |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>0</td><td>Upper Bound Exceeded</td></tr><tr><td>1</td><td>Lower Bound Exceeded</td></tr><tr><td>2</td><td>Upper Warning Active</td></tr><tr><td>3</td><td>Lower Warning Active</td></tr><tr><td>4-15</td><td>Reserved</td></tr></table> |                            |       |               |               | Bit | Description | 0 | Upper Bound Exceeded | 1 | Lower Bound Exceeded | 2 | Upper Warning Active | 3 | Lower Warning Active | 4-15 | Reserved |
| Bit                                                                                                                                                                                                                                                                                             | Description                |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 0                                                                                                                                                                                                                                                                                               | Upper Bound Exceeded       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 1                                                                                                                                                                                                                                                                                               | Lower Bound Exceeded       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 2                                                                                                                                                                                                                                                                                               | Upper Warning Active       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 3                                                                                                                                                                                                                                                                                               | Lower Warning Active       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 4-15                                                                                                                                                                                                                                                                                            | Reserved                   |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |

| 201A.06h                                                      | Analog Input 2 Raw ADC Value |       |               |               |
|---------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                     | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                    | $0 - [2^{(16)}-1]$           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The upper word of the Raw ADC 2 Value. |                              |       |               |               |

| 201A.07h                                                                               | Analog Input 2 Normalized Value 16bitS14 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer16                                                                              | $[-2^{(15)}] - [2^{(15)}-1]$             | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 2 result value normalized to +/-1 in 16bitS14 Notation. |                                          |       |               |               |

| 201A.08h                                                                               | Analog Input 2 Normalized Value 32bitS30 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                              | $0 - [2^{(31)}-1]$                       | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 2 result value normalized to +/-1 in 32bitS30 Notation. |                                          |       |               |               |

| 201A.09h                                                                                                                                                                                                                                                                                        | Analog Input 3 Status      |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------|---------------|---------------|-----|-------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|------|----------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range                 | Units | Accessibility | Stored to NVM |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| Unsigned16                                                                                                                                                                                                                                                                                      | 0 – [2 <sup>(16)</sup> ]-1 | N/A   | Read Only     | No            |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <b>Description:</b><br>The internal status of the Analog Input 3 module.                                                                                                                                                                                                                        |                            |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>0</td><td>Upper Bound Exceeded</td></tr><tr><td>1</td><td>Lower Bound Exceeded</td></tr><tr><td>2</td><td>Upper Warning Active</td></tr><tr><td>3</td><td>Lower Warning Active</td></tr><tr><td>4-15</td><td>Reserved</td></tr></table> |                            |       |               |               | Bit | Description | 0 | Upper Bound Exceeded | 1 | Lower Bound Exceeded | 2 | Upper Warning Active | 3 | Lower Warning Active | 4-15 | Reserved |
| Bit                                                                                                                                                                                                                                                                                             | Description                |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 0                                                                                                                                                                                                                                                                                               | Upper Bound Exceeded       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 1                                                                                                                                                                                                                                                                                               | Lower Bound Exceeded       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 2                                                                                                                                                                                                                                                                                               | Upper Warning Active       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 3                                                                                                                                                                                                                                                                                               | Lower Warning Active       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 4-15                                                                                                                                                                                                                                                                                            | Reserved                   |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |

| 201A.0Ah                                                      | Analog Input 3 Raw ADC Value |       |               |               |
|---------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                     | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                    | 0 – $2^{16}-1$               | N/A   | Read Only     | No            |
| <b>Description:</b><br>The upper word of the Raw ADC 3 Value. |                              |       |               |               |

| 201A.0Bh                                                                               | Analog Input 3 Normalized Value 16bitS14 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer16                                                                              | $[-2^{15}] - [2^{15}-1]$                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 3 result value normalized to +/-1 in 16bitS14 Notation. |                                          |       |               |               |

| 201A.0Ch                                                                               | Analog Input 3 Normalized Value 32bitS30 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                              | 0 – $2^{31}-1$                           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 3 result value normalized to +/-1 in 32bitS30 Notation. |                                          |       |               |               |

| 201A.0Dh                                                                                                                                                                                                                                                                                        | Analog Input 4 Status |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|---------------|---------------|-----|-------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|------|----------|
| Data Type                                                                                                                                                                                                                                                                                       | Data Range            | Units | Accessibility | Stored to NVM |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| Unsigned16                                                                                                                                                                                                                                                                                      | 0 – $2^{(16)}-1$      | N/A   | Read Only     | No            |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <b>Description:</b><br>The internal status of the Analog Input 4 module.                                                                                                                                                                                                                        |                       |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| <table><tr><th>Bit</th><th>Description</th></tr><tr><td>0</td><td>Upper Bound Exceeded</td></tr><tr><td>1</td><td>Lower Bound Exceeded</td></tr><tr><td>2</td><td>Upper Warning Active</td></tr><tr><td>3</td><td>Lower Warning Active</td></tr><tr><td>4-15</td><td>Reserved</td></tr></table> |                       |       |               |               | Bit | Description | 0 | Upper Bound Exceeded | 1 | Lower Bound Exceeded | 2 | Upper Warning Active | 3 | Lower Warning Active | 4-15 | Reserved |
| Bit                                                                                                                                                                                                                                                                                             | Description           |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 0                                                                                                                                                                                                                                                                                               | Upper Bound Exceeded  |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 1                                                                                                                                                                                                                                                                                               | Lower Bound Exceeded  |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 2                                                                                                                                                                                                                                                                                               | Upper Warning Active  |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 3                                                                                                                                                                                                                                                                                               | Lower Warning Active  |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |
| 4-15                                                                                                                                                                                                                                                                                            | Reserved              |       |               |               |     |             |   |                      |   |                      |   |                      |   |                      |      |          |

| 201A.0Eh                                                      | Analog Input 4 Raw ADC Value |       |               |               |
|---------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                     | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                    | 0 – $2^{16}-1$               | N/A   | Read Only     | No            |
| <b>Description:</b><br>The upper word of the Raw ADC 4 Value. |                              |       |               |               |

| 201A.0Fh                                                                               | Analog Input 4 Normalized Value 16bitS14 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer16                                                                              | $[-2^{15}] - [2^{15}-1]$                 | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 4 result value normalized to +/-1 in 16bitS14 Notation. |                                          |       |               |               |

| 201A.10h                                                                               | Analog Input 4 Normalized Value 32bitS30 |       |               |               |
|----------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                               | Units | Accessibility | Stored to NVM |
| Integer32                                                                              | 0 – $2^{31}-1$                           | N/A   | Read Only     | No            |
| <b>Description:</b><br>The ADC 4 result value normalized to +/-1 in 32bitS30 Notation. |                                          |       |               |               |

**2025h: Analog Output Values**

| 2025.01h                                                                                                                                                                                                         | Analog Output 1 Value        |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                        | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                        | $[-2^{(15)}] - [2^{(15)}-1]$ | DAO   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the value of analog output 1. The analog outputs have a range of 0 to 10 Volts. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                              |       |               |               |

| 2025.02h                                                                                                                                                                                                         | Analog Output 2 Value        |       |               |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                                                                                                                                        | Data Range                   | Units | Accessibility | Stored to NVM |
| Integer16                                                                                                                                                                                                        | $[-2^{(15)}] - [2^{(15)}-1]$ | DAO   | Read Only     | No            |
| <b>Description:</b><br>Contains a value corresponding to the value of analog output 2. The analog outputs have a range of 0 to 10 Volts. See <a href="#">"Appendix" on page 337</a> for unit conversion details. |                              |       |               |               |

**2015h: Deadband Input Value**

| 2015.01h                                                                                          | Deadband Input Value         |                  |               |               |
|---------------------------------------------------------------------------------------------------|------------------------------|------------------|---------------|---------------|
| Data Type                                                                                         | Data Range                   | Units            | Accessibility | Stored to NVM |
| Integer32                                                                                         | $[-2^{(31)}] - [2^{(31)}-1]$ | DC2, DS1, counts | Read Only     | No            |
| <b>Description:</b><br>Value of the command input to the Deadband function. Mode dependant units. |                              |                  |               |               |

**2018h: Programmable Limit Switch Values**

| 2018.01h                                                                                                                                                                                    | PLS Input Value              |        |               |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------|---------------|---------------|
| Data Type                                                                                                                                                                                   | Data Range                   | Units  | Accessibility | Stored to NVM |
| Integer32                                                                                                                                                                                   | $[-2^{(31)}] - [2^{(31)}-1]$ | counts | Read Only     | No            |
| <b>Description:</b><br>Contains the value of the programmable limit switch position input. If a rollover value has been defined, this value will range between zero and the rollover value. |                              |        |               |               |

| 2018.02h                                                                                                                 | PLS 1 State |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------|-------------|-------|---------------|---------------|
| Data Type                                                                                                                | Data Range  | Units | Accessibility | Stored to NVM |
| Bits                                                                                                                     | 0-1         | -     | Read Only     | No            |
| <b>Description:</b><br>Contains the current state of programmable limit switch 1. This bit is high when PLS 1 is active. |             |       |               |               |

| 2018.03h                                                                                                                 | PLS 2 State |       |               |               |
|--------------------------------------------------------------------------------------------------------------------------|-------------|-------|---------------|---------------|
| Data Type                                                                                                                | Data Range  | Units | Accessibility | Stored to NVM |
| Bits                                                                                                                     | 0-1         | -     | Read Only     | No            |
| <b>Description:</b><br>Contains the current state of programmable limit switch 2. This bit is high when PLS 2 is active. |             |       |               |               |

### 2028h: Fault Log Counter

| 2028.01h                                                                  | Log Counter: Total Run Time |       |               |               |
|---------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                 | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned48                                                                | 0 – 2 <sup>48</sup>         | msec  | Read Only     | No            |
| <b>Description:</b><br>This object holds the total run time of the drive. |                             |       |               |               |

| 2028.02h                                                                              | Log Counter: Drive Reset    |       |               |               |
|---------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                             | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                            | 0 - [2 <sup>(16)</sup> – 1] | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Drive Reset occurred in the life of the drive. |                             |       |               |               |

| 2028.03h                                                                                       | Log Counter: Drive Internal Error |       |               |               |
|------------------------------------------------------------------------------------------------|-----------------------------------|-------|---------------|---------------|
| Data Type                                                                                      | Data Range                        | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                     | 0 - [2 <sup>(16)</sup> – 1]       | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Drive Internal Error occurred in the life of the drive. |                                   |       |               |               |

| 2028.04h                                                                                | Log Counter: Short Circuit  |       |               |               |
|-----------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                               | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                              | 0 - [2 <sup>(16)</sup> – 1] | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Short Circuit occurred in the life of the drive. |                             |       |               |               |

| 2028.05h                                                                               | Log Counter: Over Current |       |               |               |
|----------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                             | 0 - $2^{(16)} - 1$        | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Over Current occurred in the life of the drive. |                           |       |               |               |

| 2028.06h                                                                                         | Log Counter: Hardware Under Voltage |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $2^{(16)} - 1$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Hardware Under Voltage occurred in the life of the drive. |                                     |       |               |               |

| 2028.07h                                                                                        | Log Counter: Hardware Over Voltage |       |               |               |
|-------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                       | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                      | 0 - $2^{(16)} - 1$                 | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Hardware Over Voltage occurred in the life of the drive. |                                    |       |               |               |

| 2028.08h                                                                                         | Log Counter: Drive Over Temperature |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $2^{(16)} - 1$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Drive Over Temperature occurred in the life of the drive. |                                     |       |               |               |

| 2028.09h                                                                                          | Log Counter: Parameter Restore Error |       |               |               |
|---------------------------------------------------------------------------------------------------|--------------------------------------|-------|---------------|---------------|
| Data Type                                                                                         | Data Range                           | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                        | 0 - $2^{(16)} - 1$                   | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Parameter Restore Error occurred in the life of the drive. |                                      |       |               |               |

| 2028.0Ah                                                                                        | Log Counter: Parameter Store Error |       |               |               |
|-------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                       | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                      | 0 - $2^{(16)} - 1$                 | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Parameter Store Error occurred in the life of the drive. |                                    |       |               |               |



| 2028.0Bh                                                                                     | Log Counter: Invalid Hall State |       |               |               |
|----------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                    | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                   | 0 - $2^{(16)} - 1$              | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Invalid Hall State occurred in the life of the drive. |                                 |       |               |               |

| 2028.0Ch                                                                                    | Log Counter: Phase Synchronization Error |       |               |               |
|---------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                   | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                  | 0 - $2^{(16)} - 1$                       | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Phase Sync. Error occurred in the life of the drive. |                                          |       |               |               |

| 2028.0Dh                                                                                         | Log Counter: Motor Over Temperature |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $2^{(16)} - 1$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Motor Over Temperature occurred in the life of the drive. |                                     |       |               |               |

| 2028.0Eh                                                                                        | Log Counter: Phase Detection Fault |       |               |               |
|-------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                       | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                      | 0 - $2^{(16)} - 1$                 | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Phase Detection Fault occurred in the life of the drive. |                                    |       |               |               |

| 2028.0Fh                                                                                        | Log Counter: Feedback Sensor Error |       |               |               |
|-------------------------------------------------------------------------------------------------|------------------------------------|-------|---------------|---------------|
| Data Type                                                                                       | Data Range                         | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                      | 0 - $2^{(16)} - 1$                 | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Feedback Sensor Error occurred in the life of the drive. |                                    |       |               |               |

| 2028.10h                                                                                   | Log Counter: Log Entry Missed |       |               |               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                 | 0 - $2^{(16)} - 1$            | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Log Entry Missed occurred in the life of the drive. |                               |       |               |               |

| 2028.11h                                                                                   | Log Counter: Software Disable |       |               |               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                 | 0 - $2^{(16)} - 1$            | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Software Disable occurred in the life of the drive. |                               |       |               |               |

| 2028.12h                                                                               | Log Counter: User Disable |       |               |               |
|----------------------------------------------------------------------------------------|---------------------------|-------|---------------|---------------|
| Data Type                                                                              | Data Range                | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                             | 0 - $2^{(16)} - 1$        | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Disable occurred in the life of the drive. |                           |       |               |               |

| 2028.13h                                                                                      | Log Counter: User Positive Limit |       |               |               |
|-----------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | 0 - $2^{(16)} - 1$               | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Positive Limit occurred in the life of the drive. |                                  |       |               |               |

| 2028.14h                                                                                      | Log Counter: User Negative Limit |       |               |               |
|-----------------------------------------------------------------------------------------------|----------------------------------|-------|---------------|---------------|
| Data Type                                                                                     | Data Range                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                    | 0 - $2^{(16)} - 1$               | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Negative Limit occurred in the life of the drive. |                                  |       |               |               |

| 2028.15h                                                                                   | Log Counter: Current Limiting |       |               |               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                 | 0 - $2^{(16)} - 1$            | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Current Limiting occurred in the life of the drive. |                               |       |               |               |

| 2028.16h                                                                                     | Log Counter: Continuous Current |       |               |               |
|----------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                    | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                   | 0 - $2^{(16)} - 1$              | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Continuous Current occurred in the life of the drive. |                                 |       |               |               |

| 2028.17h                                                                                         | Log Counter: Current Loop Saturated |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $[2^{(16)} - 1]$                | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Current Loop Saturated occurred in the life of the drive. |                                     |       |               |               |

| 2028.18h                                                                                     | Log Counter: User Under Voltage |       |               |               |
|----------------------------------------------------------------------------------------------|---------------------------------|-------|---------------|---------------|
| Data Type                                                                                    | Data Range                      | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                   | 0 - $[2^{(16)} - 1]$            | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Under Voltage occurred in the life of the drive. |                                 |       |               |               |

| 2028.19h                                                                                    | Log Counter: User Over Voltage |       |               |               |
|---------------------------------------------------------------------------------------------|--------------------------------|-------|---------------|---------------|
| Data Type                                                                                   | Data Range                     | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                  | 0 - $[2^{(16)} - 1]$           | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Over Voltage occurred in the life of the drive. |                                |       |               |               |

| 2028.1Ah                                                                                         | Log Counter: User Auxiliary Disable |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $[2^{(16)} - 1]$                | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Auxiliary Disable occurred in the life of the drive. |                                     |       |               |               |

| 2028.1Bh                                                                                         | Log Counter: Shunt Regulator Active |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $[2^{(16)} - 1]$                | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Shunt Regulator Active occurred in the life of the drive. |                                     |       |               |               |

| 2028.1Ch                                                                                         | Log Counter: Command Limiter Active |       |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                        | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                       | 0 - $[2^{(16)} - 1]$                | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Command Limiter Active occurred in the life of the drive. |                                     |       |               |               |

| 2028.1Dh                                                                                  | Log Counter: Motor Overspeed |       |               |               |
|-------------------------------------------------------------------------------------------|------------------------------|-------|---------------|---------------|
| Data Type                                                                                 | Data Range                   | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                | 0 - $2^{(16)} - 1$           | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Motor Overspeed occurred in the life of the drive. |                              |       |               |               |

| 2028.1Eh                                                                             | Log Counter: At Command |       |               |               |
|--------------------------------------------------------------------------------------|-------------------------|-------|---------------|---------------|
| Data Type                                                                            | Data Range              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                           | 0 - $2^{(16)} - 1$      | count | Read Only     | No            |
| <b>Description:</b><br>Number of times At Command occurred in the life of the drive. |                         |       |               |               |

| 2028.1F0h                                                                            | Log Counter: Zero Speed |       |               |               |
|--------------------------------------------------------------------------------------|-------------------------|-------|---------------|---------------|
| Data Type                                                                            | Data Range              | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                           | 0 - $2^{(16)} - 1$      | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Zero Speed occurred in the life of the drive. |                         |       |               |               |

| 2028.20h                                                                                           | Log Counter: Velocity Following Error |       |               |               |
|----------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                          | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 0 - $2^{(16)} - 1$                    | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Velocity Following Error occurred in the life of the drive. |                                       |       |               |               |

| 2028.21h                                                                                                 | Log Counter: Positive Target Velocity Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                               | 0 - $2^{(16)} - 1$                          | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Positive Target Velocity Limit occurred in the life of the drive. |                                             |       |               |               |

| 2028.22h                                                                                                 | Log Counter: Negative Target Velocity Limit |       |               |               |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                | Data Range                                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                               | 0 - $2^{(16)} - 1$                          | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Negative Target Velocity Limit occurred in the life of the drive. |                                             |       |               |               |

| 2028.23h                                                                                                | Log Counter: Upper Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                               | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 - $[2^{(16)} - 1]$                       | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Upper Measured Position Limit occurred in the life of the drive. |                                            |       |               |               |

| 2028.24h                                                                                                | Log Counter: Lower Measured Position Limit |       |               |               |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                               | Data Range                                 | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                              | 0 - $[2^{(16)} - 1]$                       | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Lower Measured Position Limit occurred in the life of the drive. |                                            |       |               |               |

| 2028.25h                                                                                   | Log Counter: At Home Position |       |               |               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------|---------------|---------------|
| Data Type                                                                                  | Data Range                    | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                 | 0 - $[2^{(16)} - 1]$          | count | Read Only     | No            |
| <b>Description:</b><br>Number of times At Home Position occurred in the life of the drive. |                               |       |               |               |

| 2028.26h                                                                                           | Log Counter: Position Following Error |       |               |               |
|----------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                          | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 0 - $[2^{(16)} - 1]$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Position Following Error occurred in the life of the drive. |                                       |       |               |               |

| 2028.27h                                                                                              | Log Counter: Upper Target Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                             | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                            | 0 - $[2^{(16)} - 1]$                     | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Upper Target Position Limit occurred in the life of the drive. |                                          |       |               |               |

| 2028.28h                                                                                              | Log Counter: Lower Target Position Limit |       |               |               |
|-------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                             | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                            | 0 - $[2^{(16)} - 1]$                     | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Lower Target Position Limit occurred in the life of the drive. |                                          |       |               |               |

| 2028.29h   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Ah   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Bh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Ch   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Dh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Eh   | Reserved   |       |               |               |
|------------|------------|-------|---------------|---------------|
| Data Type  | Data Range | Units | Accessibility | Stored to NVM |
| Unsigned16 | N/A        | N/A   | Read Only     | No            |

| 2028.2Fh                                                                                              | Log Counter: Communication Channel Error |       |               |               |
|-------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                             | Data Range                               | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                            | 0 - $2^{(16)} - 1$                       | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Communication Channel Error occurred in the life of the drive. |                                          |       |               |               |

| 2028.30h                                                                                 | Log Counter: Commanded Stop |       |               |               |
|------------------------------------------------------------------------------------------|-----------------------------|-------|---------------|---------------|
| Data Type                                                                                | Data Range                  | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                               | 0 - $2^{(16)} - 1$          | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Commanded Stop occurred in the life of the drive. |                             |       |               |               |

| 2028.31h                                                                            | Log Counter: User Stop |       |               |               |
|-------------------------------------------------------------------------------------|------------------------|-------|---------------|---------------|
| Data Type                                                                           | Data Range             | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                          | 0 - $[2^{(16)} - 1]$   | count | Read Only     | No            |
| <b>Description:</b><br>Number of times User Stop occurred in the life of the drive. |                        |       |               |               |

| 2028.32h                                                                                           | Log Counter: Commanded Positive Limit |       |               |               |
|----------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                          | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 0 - $[2^{(16)} - 1]$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Commanded Positive Limit occurred in the life of the drive. |                                       |       |               |               |

| 2028.33h                                                                                           | Log Counter: Commanded Negative Limit |       |               |               |
|----------------------------------------------------------------------------------------------------|---------------------------------------|-------|---------------|---------------|
| Data Type                                                                                          | Data Range                            | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                         | 0 - $[2^{(16)} - 1]$                  | count | Read Only     | No            |
| <b>Description:</b><br>Number of times Commanded Negative Limit occurred in the life of the drive. |                                       |       |               |               |

| 2028.34h                                                                                                      | Log Counter: PWM and Direction Broken Wire Error |       |               |               |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------|---------------|---------------|
| Data Type                                                                                                     | Data Range                                       | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                                    | 0 - $[2^{(16)} - 1]$                             | count | Read Only     | No            |
| <b>Description:</b><br>Number of times PWM and Direction Broken Wire Error occurred in the life of the drive. |                                                  |       |               |               |

| 2028.35h                                                                                               | Log Counter: High Current Indicator |       |               |               |
|--------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|---------------|
| Data Type                                                                                              | Data Range                          | Units | Accessibility | Stored to NVM |
| Unsigned16                                                                                             | 0 - $[2^{(16)} - 1]$                | count | Read Only     | No            |
| <b>Description:</b><br>Number of times High Current Indicator Fault occurred in the life of the drive. |                                     |       |               |               |

# A Appendix

## A.1 Appendix A - Units

Table A.1 below shows scaling factors and formulas for converting physical units to drive units.

**TABLE A.1 Drive Units and Scaling Factors**

| Abbreviation | Drive Unit Type       | Physical Units        | Data Type            | Scaling Factor         |
|--------------|-----------------------|-----------------------|----------------------|------------------------|
| DA1          | Acceleration          | counts/s <sup>2</sup> | Integer32/Unsigned32 | $2^{34}/K_S^2$         |
| DA2          | Acceleration          | counts/s <sup>2</sup> | Unsigned48           | $2^{34}/K_S^2$         |
| DA3          | Acceleration          | counts/s <sup>2</sup> | Integer32            | $2^{28}/K_{MS} K_S$    |
| DA4          | Acceleration          | counts/s <sup>2</sup> | Integer32            | $(2^{18})/(K_S^2)$     |
| DA5          | Acceleration          | counts/s <sup>2</sup> | Unsigned48           | $2^{28}/K_{DS} K_S$    |
| DC1          | Current               | A                     | Integer16            | $2^{14}/K_P$           |
| DC2          | Current               | A                     | Integer16/Integer32  | $1000/K_P$             |
| DJ1          | Jerk                  | A/s                   | Unsigned48           | $2^{32}/(K_P K_S)$     |
| DG1          | Angle                 | degrees               | Integer16/Unsigned16 | $2^{16}/360$           |
| DS1          | Speed/Velocity        | counts/s              | Integer32            | $2^{17}/K_S$           |
| DS2          | Speed/Velocity        | counts/s              | Unsigned48           | $2^{17}/K_S$           |
| DS3          | Speed/Velocity        | counts/s              | Integer64            | $2^{33}/K_S$           |
| DS4          | Speed/Velocity        | counts/s              | Unsigned32           | $2^{17}/K_S$           |
| DV1          | Voltage               | V                     | Integer16            | $2^{14}/(1.05 K_{OV})$ |
| DPV          | Phase Voltage         | V                     | Integer16            | $2^{14}/K_B$           |
| DAI          | Analog Input Voltage  | V                     | Integer16            | $2^{14}/20$            |
| DAO          | Analog Output Voltage | V                     | Integer16            | $2^{14}/10$            |
| DT1          | Temperature           | °C                    | Integer32            | $2^{16}$               |
| PBC          | Power Board Current   | A                     | Unsigned16           | 10                     |
| PBV          | Power Board Voltage   | V                     | Unsigned16           | 10                     |
| PBT          | Power Board Time      | s                     | Unsigned16           | 100                    |
| PBF          | Power Board Frequency | Hz                    | Unsigned32           | $2^{16}/1000$          |
| SF1          | Scale Factor 1        | -                     | -                    | $2^{14}$               |

1. Multiply physical units by the scaling factor to obtain drive units. Divide drive units by the scaling factor to obtain physical units.

The drive units used for a parameter depend upon the parameter type and size. Drive units must be rounded to the nearest integer and then converted to a hexadecimal base of the appropriate data type before they are written to the drive. When converting to a signed integer



data type, use two's complement for representation of negative numbers (see “[Conversion Example 3](#)” on page 339). Some scaling factors involve drive dependent constants. These constants are given in [Table A.2](#), along with details on determining their values.

**TABLE A.2 Drive dependent conversion constants**

| Constant | Value                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $K_B$    | DC Bus Voltage in volts. This value can be read from 200F.01h.                                                                                                      |
| $K_{DS}$ | Maximum dynamic index speed (in counts/s). This value can be read from 20CA.07h, 20CA.08h, 20CA.09h, and 20CA.0Ah.                                                  |
| $K_{MS}$ | Maximum profiler speed (in counts/s) for an Accel/Decel command profile. This value can be read from 203C.09h for Configuration 0 and 203C.0Ch for Configuration 1. |
| $K_{OV}$ | The hardware defined, DC bus, over-voltage limit of the drive in volts. This value can be read from 20D8.03h.                                                       |
| $K_P$    | The maximum rated peak current of the drive in amps. This value can be read from 20D8.05h.                                                                          |
| $K_S$    | Switching frequency of the drive in Hz. This value can be found on the drive datasheet, or can be calculated from the Default PWM Period in object 20D8.07h.        |

### A.1.1 Conversion Example 1

- **Feedback:** 1000 Line Incremental Encoder

To specify a Jog Speed 0 (2253.05h) of 10,000 RPM, first convert to the appropriate physical unit as shown below, keeping in mind that counts have a quadrature resolution (4X) over lines.

$$10,000 \frac{\text{rev}}{\text{min}} \times \frac{1000 \text{ lines}}{1 \text{ rev}} \times \frac{4 \text{ counts}}{1 \text{ line}} \times \frac{1 \text{ min}}{60 \text{ sec}} = 666,666.7 \frac{\text{counts}}{\text{sec}}$$

Jog Speed 0 is of data type Integer32 and uses DS1 drive units. Taking the appropriate 32-bit scaling factor from [Table A.1](#) yields

$$666,666.7 \times \frac{2^{17}}{K_I K_S} = 666,666.7 \times \frac{2^{17}}{1 \times 20,000} = 4369066.9$$

where  $K_I = 1$  because we are not dealing with 1 V<sub>pp</sub> Sin/Cos feedback. Rounding this to the nearest integer and converting to a hexadecimal base then results in

$$4369067_{10} = 42AAAB_{16}$$

Now, to apply the setting, a value of 42AAABh would be written to sub-index 2253.05h.

### A.1.2 Conversion Example 2

- **Feedback:** 1000 cycles per revolution; 1V<sub>p-p</sub> Sine/Cosine Encoder

To specify a Jog Speed 0 (2253.05h) of 10,000 RPM, first convert to the appropriate physical unit as shown below, keeping in mind that counts have a quadrature resolution (4X) over each cycle.

$$10,000 \frac{\text{rev}}{\text{min}} \times \frac{K_I \cdot \# \text{cycles}}{1 \text{ rev}} \times \frac{4 \text{ counts}}{1 \text{ cycle}} \times \frac{1 \text{ min}}{60 \text{ sec}} = 666.7 \cdot K_I \cdot \# \frac{\text{counts}}{\text{sec}}$$

Jog Speed 0 is of data type Integer32 and uses DS1 drive units. Taking the appropriate 32-bit scaling factor from [Table A.1](#) yields:

$$666.7 \cdot K_I \cdot \# \times \frac{2^{17}}{K_I K_S} = 666.7 \cdot \# \times \frac{2^{17}}{20,000} = 4369.0669 \cdot \#$$

where the  $K_I$  term cancels out. Note that the “#” in the two conversions (shown above) equal 1000. Rounding this to the nearest integer and converting to a hexadecimal base then results in:

$$4369067_{10} = 42AAAB_{16}$$

Now, to apply the setting, a value of 42AAABh would be written to sub-index 2253.05h.

### A.1.3 Conversion Example 3

To set a temperature parameter to 23°F first convert to the appropriate physical unit as shown below.

$$\frac{5}{9}(23 - 32) = -5^{\circ}\text{C}.$$

Referring to [Table A.1](#), the appropriate scaling factor yields:

$$-5 \times 2^{16} = -327680$$

Because the resulting integer value is negative, two's complement notation will be used to represent its hexadecimal equivalent. To obtain the two's complement, the positive version of the desired number should be subtracted from  $2^N$ , where N is the number of bits in the data type. Temperature parameters use the data type Integer32 so the calculation is as follows:

$$2^N - 327680 = 2^{32} - 327680 = 4294639616$$

$$4294639616_{10} = \text{FFFB0000}_{16}$$

The final step would be to write a value of FFFB0000h to the appropriate parameter.

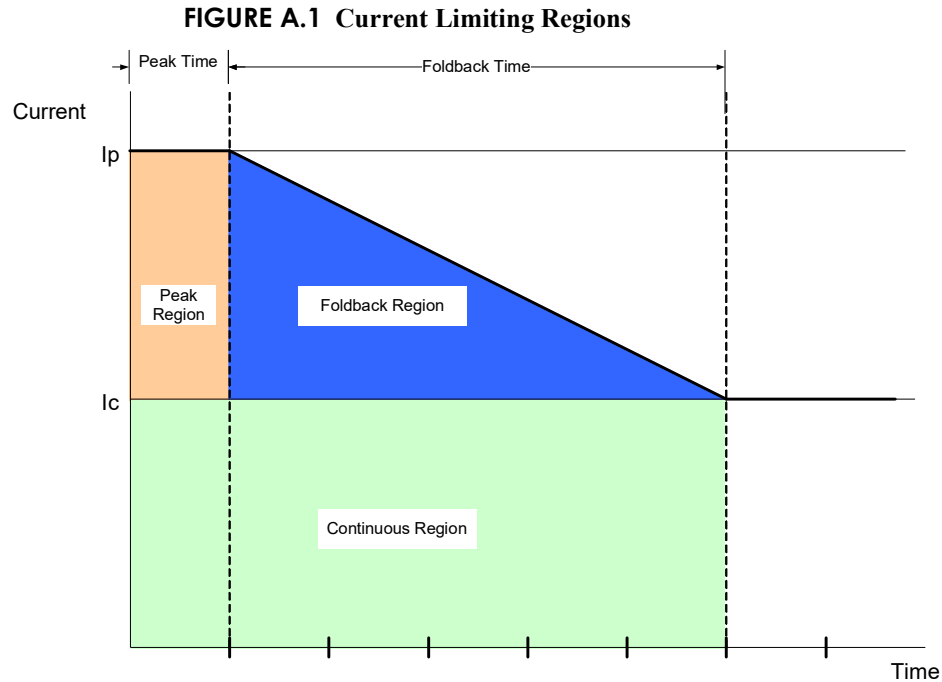
## A.2 Drive Signal Enums

**TABLE A.3 Drive Signal Enums**

| Enum Value | Name                             |
|------------|----------------------------------|
| 1          | Electrical Cycle Position        |
| 2          | Commutation Position             |
| 5          | Hall State                       |
| 12         | Phase A Current                  |
| 14         | Phase B Current                  |
| 16         | Phase C Current                  |
| 25         | Phase A Voltage                  |
| 26         | Phase B Voltage                  |
| 27         | Phase C Voltage                  |
| 35         | Current Offset                   |
| 36         | Current Target                   |
| 37         | Current Demand                   |
| 38         | Current Measured                 |
| 39         | Current Error                    |
| 47         | Velocity Offset                  |
| 48         | Velocity Target                  |
| 49         | Velocity Demand                  |
| 50         | Velocity Measured                |
| 51         | Velocity Measured Post Filtering |
| 52         | Velocity Error                   |
| 54         | Position Offset                  |
| 55         | Position Target                  |
| 56         | Position Demand                  |
| 58         | Position Measured                |
| 59         | Position Error                   |
| 104        | Bus Voltage                      |
| 111        | Incremental Encoder 1 Position   |
| 113        | Incremental Encoder 2 Position   |
| 115        | Absolute Encoder 1 Position      |
| 168        | Drive Temperature                |
| 190        | Drive Bridge Status              |
| 191        | Drive Protection Status          |
| 192        | System Protection Status         |
| 193        | Drive/System Status 1            |
| 194        | Drive/System Status 2            |
| 195        | Drive/System Status 3            |

## A.3 Appendix B - Current Limiting Algorithm

In order to understand the current limiting algorithm used by *ADVANCED* Motion Controls DP Series drives, it is necessary to first understand the different current limiting regions. The graph in [Figure A.1](#) breaks the available current into three different regions.



- **Continuous Region:** The commanded current is less than or equal to the continuous current limit. The available current is equal to the commanded current.
- **Peak Region:** The commanded current is between the continuous and peak current limits. The available current is equal to the commanded current for a limited time (Peak Time).
- **Foldback Region:** Commanded current is between the continuous and peak current limits of the drive. The available current is less than the commanded current. The available current decreases over time until it equals the continuous current limit. The rate of this decrease is equal to:

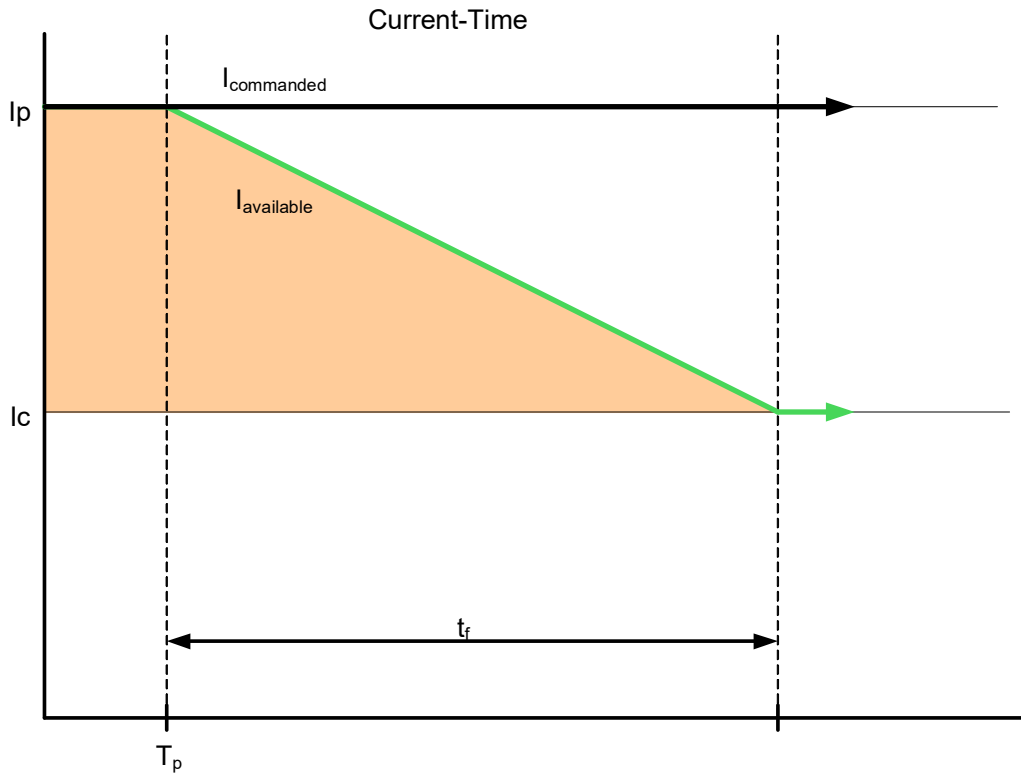
$$Slope = \frac{I_p - I_c}{t_f}$$

|       |                          |
|-------|--------------------------|
| $I_p$ | Peak current limit       |
| $I_c$ | Continuous current limit |
| $t_f$ | Foldback time            |

### A.3.1 Time-Based Peak Current Limiting

The full peak value of current is available to begin with. When a current command is equal to the peak current limit, the current begins to foldback to the continuous limit after  $T_p$ , following the same slope as given in Figure A.1. Once the available current has reached the continuous current limit after  $t_f$ , the available current will be limited to the continuous current limit until the commanded current is dropped below the continuous level.

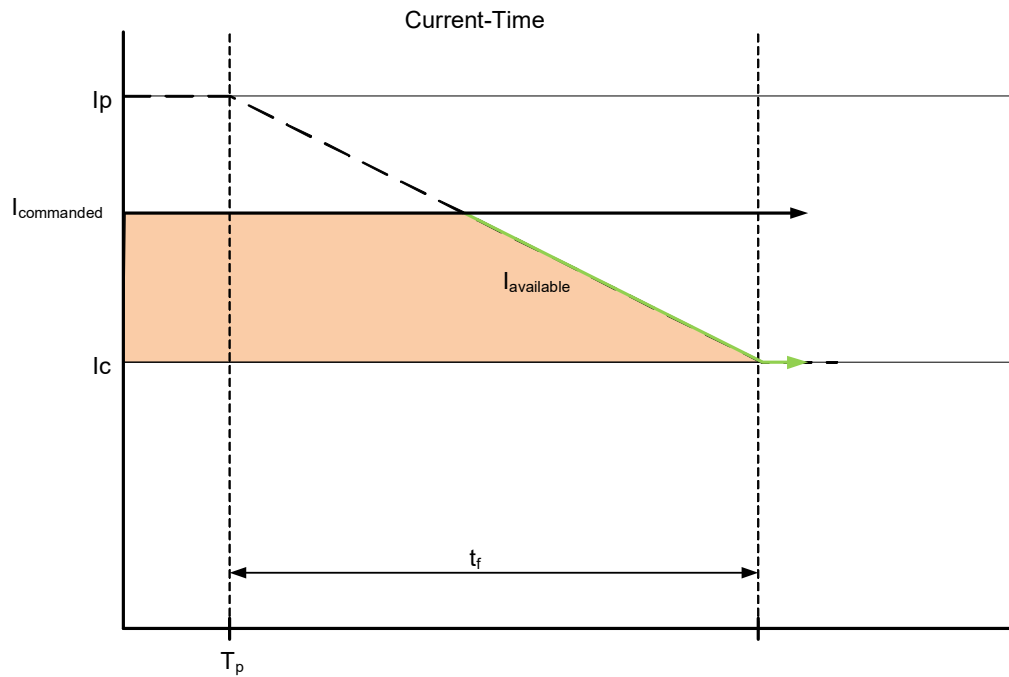
**FIGURE A.2 Time-Based Peak Current Limiting**



### A.3.2 Time-Based Non-Peak Current Limiting

When the commanded current is between the peak and continuous current limits, the available current will begin to foldback at the intersection with the slope from “Time-Based Peak Current Limiting”. The larger the commanded current, the sooner the available current will begin to foldback.

**FIGURE A.3** Time-Based Non-Peak Current Limiting



### A.3.3 Time-Based Current Recovery

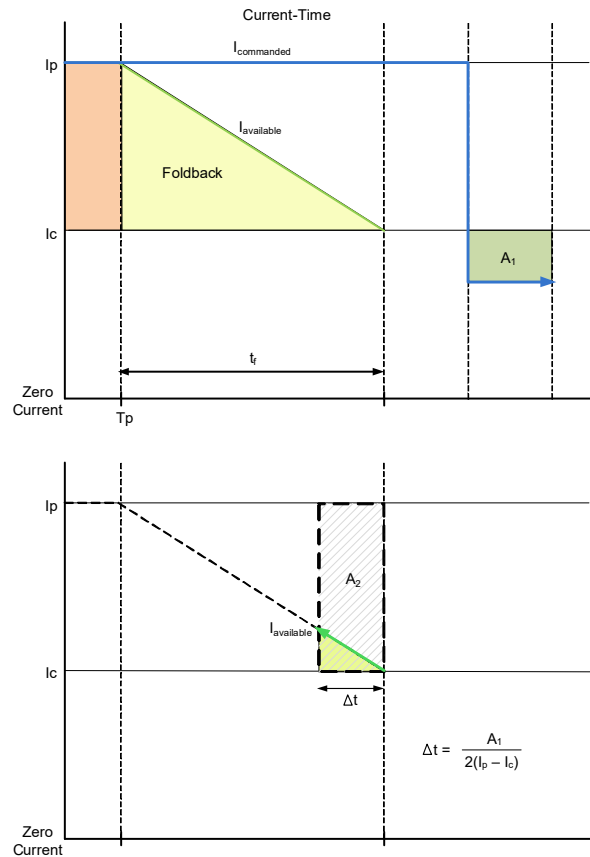
Initially, the full peak value of current is available. A commanded current above the continuous level causes the available current to foldback to the continuous level as shown in the first graph of Figure A.4. When the commanded current drops below the continuous current limit value ( $A_1$  in the first graph), the available current will then begin to recover along the slope of the foldback line towards the peak current level, as shown in the second graph of Figure A.4. The relationship between the commanded current and the recovered current is given as:

$$A_2 = \frac{1}{2}A_1$$

Using this relationship, you can calculate the amount of time recovered,  $\Delta t$ , by using the following equation:

$$\Delta t = \frac{A_1}{2(I_p - I_c)}$$

**FIGURE A.4 Time-Based Current Recovery - Foldback and Commanded Current**

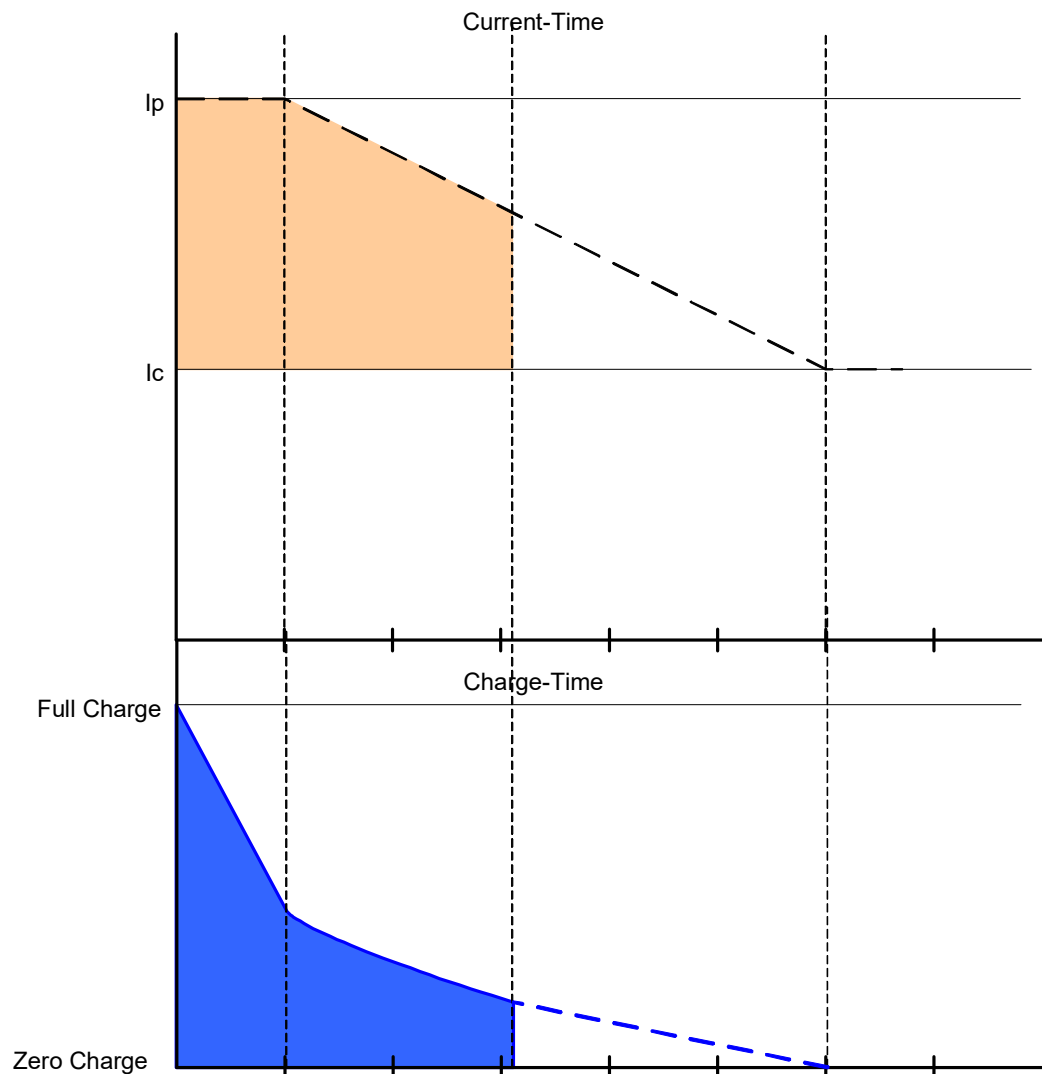


Note that current must be commanded below the specified continuous value to start recovering from a foldback condition.

### A.3.4 Charge-Based Peak Current Limiting

The charge is full to begin with. When a current greater than the continuous current limit is commanded, the charge begins to decay. The loss of charge is determined by the area under the curve as shown in Figure A.5. The larger the command, the faster the charge will decay. When the charge decreases to zero, the available current will be limited to the continuous current limit until the charge is restored.

**FIGURE A.5** Charge-Based Peak Current Limiting

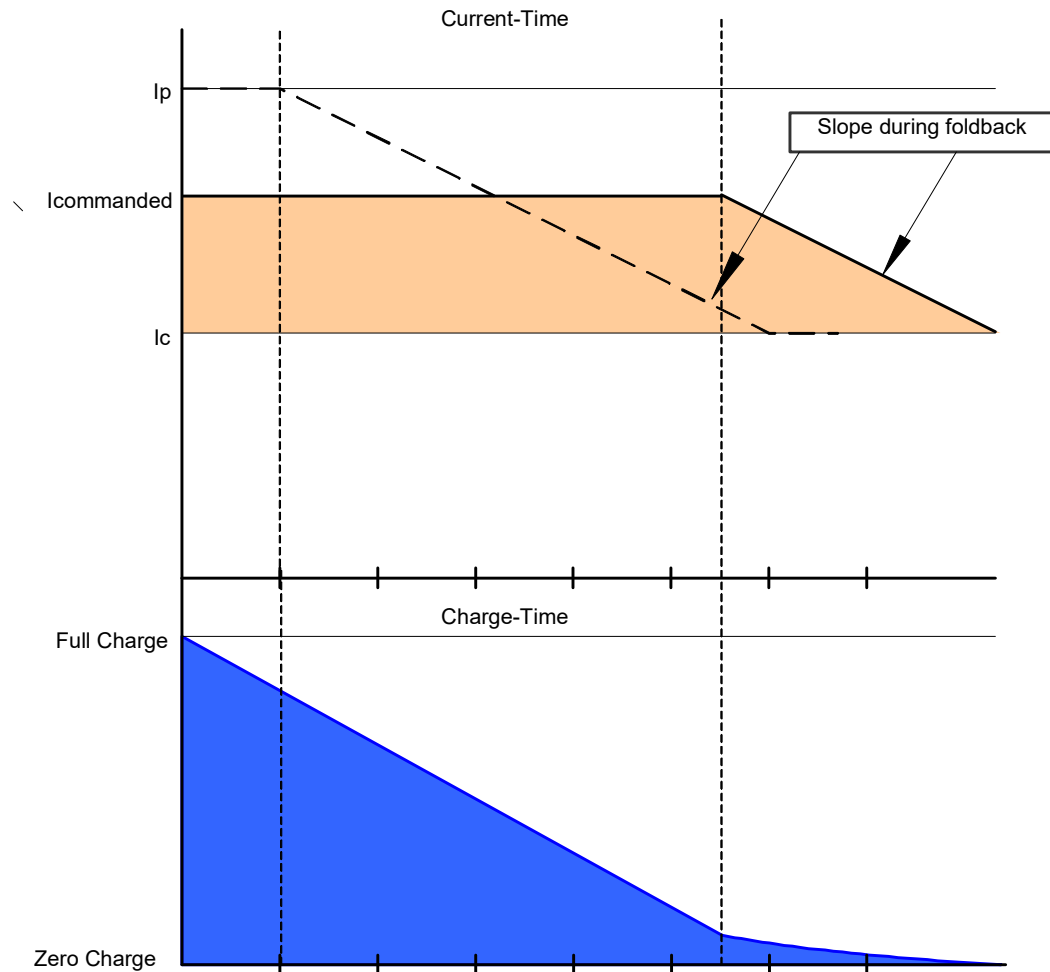




### A.3.5 Charge-Based Non-Peak Current Limiting

When the commanded current is between the peak and continuous current limits, the commanded current will be available for a longer period when compared to limiting at peak command. Note that the slope of the line during foldback is the same for both cases.

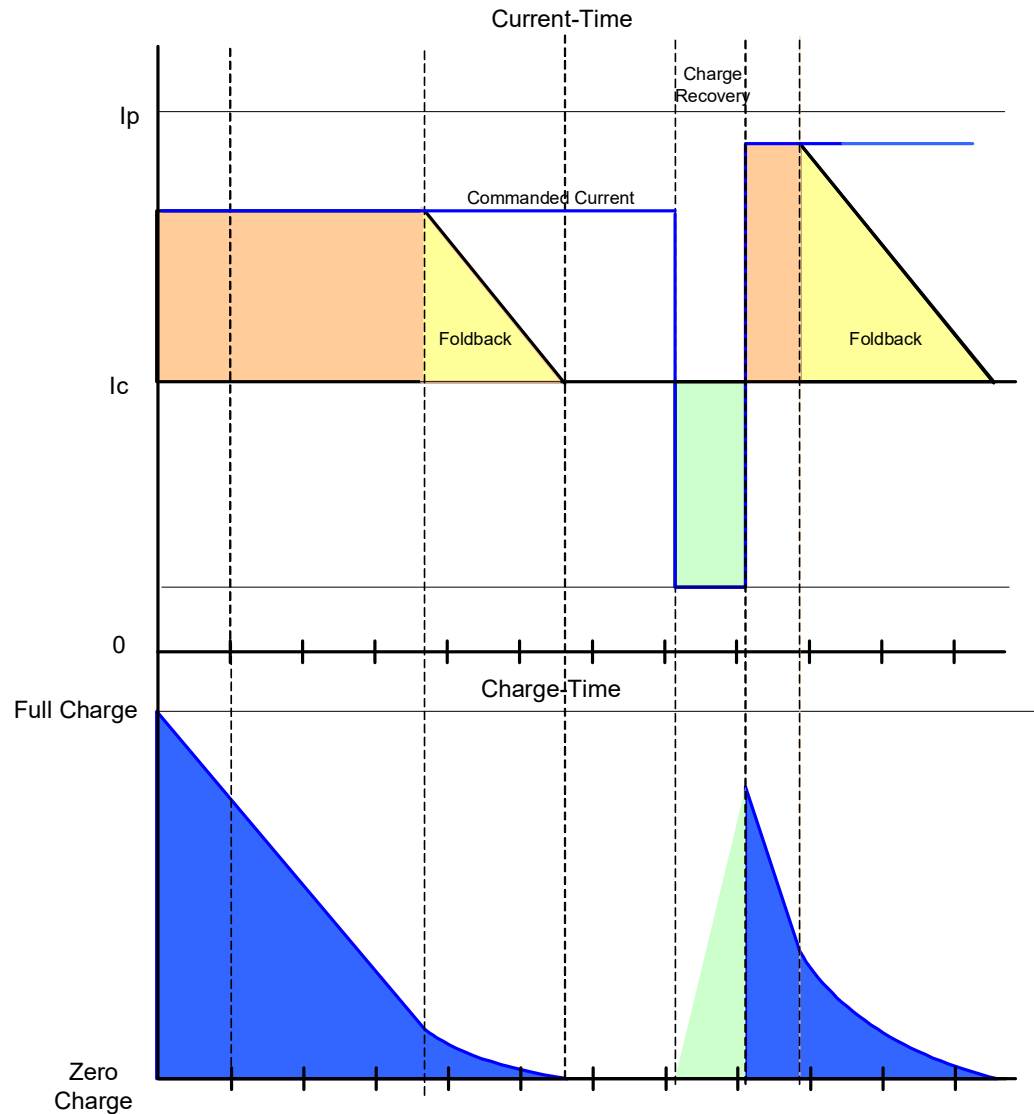
**FIGURE A.6** Charge-Based Non-Peak Current Limiting



### A.3.6 Charge-Based Current Recovery

After losing some value of charge, the charge may be recovered when the commanded value is dropped less than the continuous current limit. The amount of charge recovered depends on the magnitude of the commanded current and the amount of time in which it is commanded. The amount of charge recovered can be calculated by measuring the area within the curve as shown during the charge recovery phase in [Figure A.7](#).

**FIGURE A.7** Charge Recovery



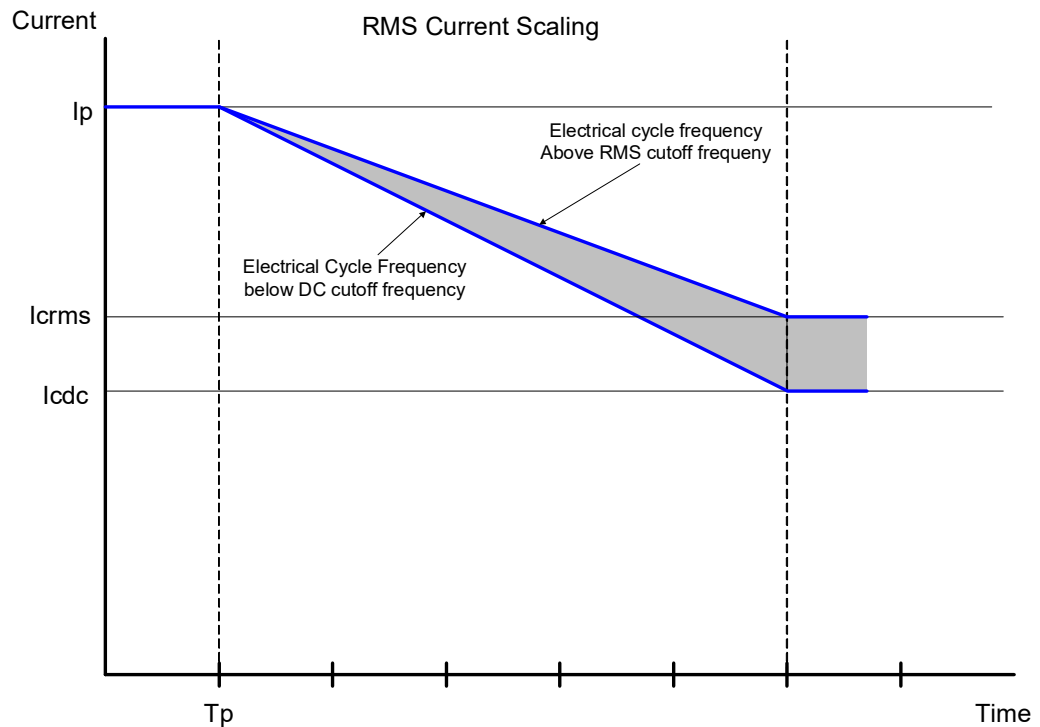
### A.3.7 RMS Current Scaling

RMS Current Scaling uses the charge-based algorithm described above. The only difference is the value of the continuous current the drive is capable of outputting. The continuous RMS limit can be used when the motor is moving so that the electrical cycle frequency is greater than the upper frequency assigned to that drive. The upper frequency is typically around 5Hz or 150 RPM for a 4-pole motor. The continuous RMS value is the continuous DC value multiplied by the square root of two.

$$I_{rms} \equiv \sqrt{2} \cdot I_{dc}$$

When the electrical cycle frequency drops below the upper frequency, the continuous current drops below the RMS value. When the motor is moving at slow speeds, the continuous current is equal to the DC value of the current.

**FIGURE A.8 RMS Current Limiting**



|                 |                                                   |                                                    |                                                      |
|-----------------|---------------------------------------------------|----------------------------------------------------|------------------------------------------------------|
| <b>Numerics</b> |                                                   |                                                    |                                                      |
| 1000h:          |                                                   | 1417h:                                             | 1621h:                                               |
| 100Ch:          | Device Type ..... 72                              | 24th Receive PDO<br>Communication Parameter.<br>92 | 28th Receive PDO Mapping<br>Parameter ..... 94       |
| 100Dh:          | Guard Time ..... 81                               | 1419h:                                             | 1800h:                                               |
| 1016h:          | Life Time Factor ..... 81                         | 26th Receive PDO<br>Communication Parameter.<br>93 | 1st Transmit PDO<br>Communication Parameter.<br>95   |
| 1017h:          | Consumer Heartbeat Time .<br>82                   | 1420h:                                             | 1802h:                                               |
| 1018h:          | Producer Heartbeat Time 82                        | 27th Receive PDO<br>Communication Parameter.<br>93 | 3rd Transmit PDO<br>Communication Parameter.<br>96   |
| 1400h:          | Identity Object ..... 82                          | 1421h:                                             | 1803h:                                               |
| 1401h:          | 1st Receive PDO<br>Communication Parameter<br>86  | 28th Receive PDO<br>Communication Parameter.<br>94 | 4th Transmit PDO<br>Communication Parameter.<br>97   |
| 1402h:          | 2nd Receive PDO<br>Communication Parameter<br>87  | 1600h:                                             | 1804h:                                               |
| 1403h:          | 3rd Receive PDO<br>Communication Parameter<br>88  | 1st Receive PDO Mapping<br>Parameter ..... 87      | 5th Transmit PDO<br>Communication Parameter.<br>97   |
| 1404h:          | 4th Receive PDO<br>Communication Parameter<br>88  | 1601h:                                             | 1814h:                                               |
| 1414h:          | 5th Receive PDO<br>Communication Parameter<br>89  | 2nd Receive PDO Mapping<br>Parameter ..... 87      | 21st Transmit PDO<br>Communication Parameter.<br>98  |
| 1415h:          | 21st Receive PDO<br>Communication Parameter<br>90 | 1602h:                                             | 1815h:                                               |
| 1416h:          | 22nd Receive PDO<br>Communication Parameter<br>91 | 3rd Receive PDO Mapping<br>Parameter ..... 88      | 22nd Transmit PDO<br>Communication Parameter.<br>99  |
|                 | 23rd Receive PDO<br>Communication Parameter<br>91 | 1603h:                                             | 1816h:                                               |
|                 |                                                   | 4th Receive PDO Mapping<br>Parameter ..... 89      | 23rd Transmit PDO<br>Communication Parameter.<br>100 |
|                 |                                                   | 1604h:                                             | 1817h:                                               |
|                 |                                                   | 5th Receive PDO Mapping<br>Parameter ..... 90      | 24th Transmit PDO<br>Communication Parameter.<br>100 |
|                 |                                                   | 1614h:                                             | 1818h:                                               |
|                 |                                                   | 21st Receive PDO Mapping<br>Parameter ..... 90     | 25th Transmit PDO<br>Communication Parameter.<br>101 |
|                 |                                                   | 1615h:                                             | 1819h:                                               |
|                 |                                                   | 22nd Receive PDO Mapping<br>Parameter ..... 91     | 26th Transmit PDO<br>Communication Parameter.<br>102 |
|                 |                                                   | 1616h:                                             | 1A00h:                                               |
|                 |                                                   | 23rd Receive PDO Mapping<br>Parameter ..... 92     | 1st Transmit PDO Mapping<br>Parameter ..... 96       |
|                 |                                                   | 1617h:                                             |                                                      |
|                 |                                                   | 24th Receive PDO Mapping<br>Parameter ..... 92     |                                                      |
|                 |                                                   | 1620h:                                             |                                                      |
|                 |                                                   | 27th Receive PDO Mapping<br>Parameter ..... 94     |                                                      |

|        |                                                  |        |                                                                           |        |                                                    |
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| 1A02h: | 3rd Transmit PDO Mapping<br>Parameter ..... 96   | 201Ch: | Gearing Values..... 302                                                   | 205Ah: | Digital Output Parameters..<br>176                 |
| 1A03h: | 4th Transmit PDO Mapping<br>Parameter ..... 97   | 201Dh: | PVT Status Values ..... 313                                               | 205Bh: | Programmable Status<br>Parameters ..... 256        |
| 1A04h: | 5th Transmit PDO Mapping<br>Parameter ..... 98   | 2021h: | Drive Temperature Values ..<br>168                                        | 2062h: | Braking/Stop General<br>Properties ..... 213       |
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