RUNNING A PROJECT ON THE MACC CONTROLLER WITH A PC BASED HMI:

Hardware Introduction:

The Motion Automation Control Card (**MACC**) is an embedded controller used to allow Click&Move[®] projects to run with "hard" real time control (RTOS), and provide motion programs a path to their respective servo drives and I/O (via CAN bus or MACCIO cards). Click&Move will also allow project debugging and HMI control through a "Gateway Project" which will typically communicate to the drive via Ethernet port. There are several connections, and protocols that can be supported. See the picture below:



Requirements for this Application Note:

- A familiar servo configuration will be needed (meaning use a pre-integrated motor drive combo in known working condition) and some preliminary ability to generate and configure basic C&M projects is assumed.
- **2.** A working Click&Move project with an HMI running on a PC. It is suggested to start with one of the existing templates. We will use the Two CAN Axes project template in this Application Note
- **3.** Working communication between the PC and the MACC (We will actually set this up as part of the App Note)

Setup Networking Hardware

This section discusses some configuration using Windows, concerning how to get a network card setup to talk properly to the MACC. This is absolutely necessary for Click&Move to work with the MACC. A simple ping test will verify if the hardware is awake and communicating properly. This process is outlined step by step below:

Be Aware Which Plug to Use:

Care should be taken in the selection and use of an RJ45 connector applied to the MACC, and PC respectively. The MACC has 2 CAN ports, that will accept a RJ45 plug, DO NOT PLUG ETHERNET INTO CAN. On the computer side, it may be best to have to Network Cards (NIC) installed. IP address configuration for IPv4 will have to take place on at least one of the NIC's if this is done on the wrong card, loss of internet may result.

Setting the IP on a Network card:

Start by opening the Network and Sharing center



Select Change adapter settings on the left.



Select the device that is not attached to the internet



Choose properties

AMC Test Status	X
General	
Connection	
IPv4 Connectivity:	No network access
IPv6 Connectivity:	No network access
Media State:	Enabled
Duration:	06:55:58
Speed:	100.0 Mbps
D <u>e</u> tails	
Activity	
s	ent — 🚚 — Received
Packets:	112 0
Properties S	Diagnose
	Qlose

Select IPv4 Properties:

Select Use this IP address. Enter in the **IP address 192.168.100.240** (anything other than 192.168.100.50 will work; 240 is the default for this demo) Enter **for the subnet: 255.255.255.0**

Internet Proto	col Version 4 (TCP/II	Pv4) Prop	erties			?	×
General							
You can get this capabili for the appr	IP settings assigned a ty. Otherwise, you ne opriate IP settings.	automatica ed to ask	lly if y /our n	our n etwor	etwork 'k admir	suppor histrato	rts or
	an IP address autom e following IP address	atically					_
<u>I</u> P addres	ss:				. :		
S <u>u</u> bnet m	ask:						
<u>D</u> efault g	ateway:						
Obtain	DNS server address a	automatica	lly				
_⊚ Us <u>e</u> th	e following DNS serve	r addresse	s:				
Preferred	DNS server:						
Alternate	DNS server:		•				
🔲 Vaļida	te settings upon exit				Adv	anced	
				ОК		Car	ncel

Plug in the MACC and wait for the system to boot. (1 minute or so)

Connect the Ethernet Port on the MACC to the correct NIC on the computer.

Open a command prompt in Windows (in the run menu type cmd):



Ping the MACC at its default address: 192.168.100.50

If all packets are lost, the connecting is somehow incorrect.

Otherwise, the MACC is alive and you can move to the next step.

Start with your PC based Project

You should have a working project already tested on the PC with HMI built. For the purposes of this App note, we will be using the Two Axes With CANOpen Network existing template. Its default will have been to have the Compiler set for PCW. The first thing we must do, is to change the compiler for the project to support the MACC. See below:

1. Set options target to MAL-MACC

🔁 Cli	ck&N	/love D	eskto	op Evalu	atio	on- C:\CandM\W	orking_4_2_1\Pro	ects\0	01_Ta	rget_	For_l	Doc				()
File	Proj	ect) R	un	Interfac	e	Virtual machine	Collected C&N	applic	ation	То	ols	Set	tings	Window	Help	
		Build	(com	pile only	y la	test changes)			ų,	虊	?	•		Target pl	atform : P	ĊW
		Rebui	ild (co	omplete	rec	ompile)										
		Delet	e C&	M gener	ate	d files										
	Open XML property file editor															
		Validate all property and config XML files														
		Open HTML project description file														
	Open HTML FB help file															
	Replace FBD editor (Eagle) settings with defaults															
		Optio	ns													
				Optio	ons	;		_								

Click this menu item, select a tab and press F1 for help. The topics in this chapter describe various project specific settings.

Select MAL and GAL:

Project options	
Target platform Desktop options Debugger options Target properties Load path	
 FMU - FMU (Fujitsu ARM Cortex M3 Microcontroller Card) with MicroC/DS-II MAL - MACC (Motion Automation Controller Card) with Linux PCL - PC with Linux PCW - PC with Microsoft Windows PLA - AMC programmable servo drive platform A 	 BCB - Borland 5.5 command line compiler GAL - ARM CortexA8 compiler GAU - ARM CortexM3 compiler GMU - MicroBlaze compiler GXL - GCC Cross Compiler On Windows for x86 Linux MGW - MinGW32 gcc compiler (Version 3.4.2) MXW - Microsoft Visual C++ Toolkit 2008
Please, download plugins for other supported (gray) platforms!	Apply
OK Cancel	Help

2. Rebuild the project and note the different compiler:



3.Click File -> Package Collected Application from Project

4. Click File -> Create Gateway

Gateway project created successfully!	
What's next?	
1. Close the current (parent) project.	가장 동안 가장 감독한 것이다. 가장 감독한 것이 없다. ㅋ
Open your newly created gateway pro current project.	iject, in the CMGateway folder of the
3. Compile the project using the Project	Rebuild menu.
4. Optionally edit (from Desktop) the Ro	ot1.Intf1xClientPort.prop.xml file to
-set the same UDP port as in Root1.Intf1 -set the same IP address as in Desktop/F parent project	ServerPort.prop.aml of the parent project hoject/Options/Target properties of the
5. Launch this gateway project with C&I	M-HMI to connect to the application in
the target device (if it is not running that	n start it from the parent project).
5. If you wish to both debug and monito	or the target application simultaneously:
First create a Collected application from	n this gateway project.
Go back to your parent project to debu	g the target application.
-Launch your Collected gateway applica	ation from the Desktop.
(You can run a collected application fro open.)	m the desktop while another project is
See also: C&M-MC help\Menu structure project	r\Desktop Menus\File\Create gateway to
	OK
	- On

5. Close the Project

Close Current Project



6. Open the Gateway project created in Step # 4 (It's inside your project folder)

Clickouviove Desi	top Evaluation	
ile Project Run	Interface Virtual machine Collected C&M application Tools Setting Collected C&M application Tools Setting Copen Project Open a previously created C&M project. The project then can be edited, run, debugged etc.	s Window Help
	Open project	×
Project name Project thumb	view ON 🔽	
CMGateway		•
Project parent o	directory	Details >>
C:\CandM\Wo	rking_5_3_3\Projects\E4D_prep	
	r.	
Project director	r-	

7. Build Gateway Project



First deletes all files generated by the C&M Compiler. Compile all FBDs (generate C++ and executable code) and creates the associated default Function Block (XML) properties files, unless they already exist. 8. Close the Gateway project

Click File -> Close Project

- 9. Open the Original Project Click File -> Open Project
- 10. Click Collect C&M Application > Create



11. Select PCW as this will run on the PC:

Select target	×
Target name	
PCW - PC with Microsoft Windows	_
ОК	Cancel

Application na	ne		
J			
Application pa	ent directory		
C:\CandM\W	orking_4_2_1\CollectedAp	plications	
New applicatio	n directory		
C-\CandM\W	nrking 4 2 1\CollectedAn	nlications	

12. Enter a Unique name for the Collected Application we are creating; Click "OK"

13. Click Add Project. Set the Parent directory to the Projects folder (It will default to the Examples folder)

Click&Move Desktop EvaluationdM/Working_4_ File Project Run Interface Virtual machine Co The project Run Interface Virtual machine Co	1\Projects\001_Target_For_Doc\CMGateway ■ ■ × Ilected C&(M application Tools Settings Window Help ■ ■ ■ 1 ■ ■ ■ 1 PCW ■ ■ ■ 1 PCW Target platform : PCW Collected Application - 001 Target For Doc COLLECTED PCW	
	Add project Add vitual device Delete Up Down Add project to Application Project parent directory [C:\CandM\Working_4_2_1\Projects\00] Project directory [C:\CandM\Working_4_2_1\Projects\00] OK	Property Files Validate all Help (F1) Browse for Folder Select parent directory of application Select parent directory of application Can Can Can Can Can Can Can Can Can C

- 14. Select the CandM_HMI (ALL_PCW) file from your project ; Click "OK"
- 15. Click Add Project again and set the parent directory to your project folder as above.
- 16. Choose the CMGateway (MGW_PCW) gateway file ; Click "OK"

Add project to Application							
Project name							
CMGateway(MGW_PCW)							
Project parent directory C:\CandM\Working 4 2 1\Projects\001 Target For Doc							
Project directory: C:\CandM\Working_4_2_1\Projects\001_Target_For_Doc\CMGateway(MGW_PCW)							
OK Cancel							

17. Click "OK" at the bottom of the collected application window

Project	s	Property Files	
Add project E4D_p CMGa	orep_CandM_HMI\1(ALL_PCW) teway\1(MGW_PCW)		Setup
Add virtual device			Validate all
Delete			Help (F1)
Up			
Down			

Running your Application

- _ 0 X Click&Move Desktop Evaluation- C:\CandM\Working_5_3_3\Projects\E4D_prep Project Run Interface Virtual machine Collected C&M application Tools Settings Window Help Convert CANOpen DCF to CDS file L 3 ★ - ● • Target platform : MAL Run Application Image Download Server Download Packaged Application to Remote De **Run FTP Client** Download Packaged application to remote device **Fieldbus Settings** Download the Packaged application in the project directory, according the Merge Files settings in "Project/Options/Target properties", via FTP. The remote device may be a MACC (Motion Automation Control Card) or a PC with Linux or Windows OS. Project must be rebuilt for the remote platform before downloading!
- 1. Click Tools -> Download Packaged Application to Remote device

2. Click Run -> Load C&M Package and Run



3. Click Collected C&M Application -> Run

File Project Run Interface Virtual machine	Collected C&M application	n Tools Settin	ngs Window Help	
<u>B</u> 3 1 1 - ≥ ⊇ 1	Create Config Run	₿ ? •	Target platform : MAL	l
	Delete Run Copy as Run t Close A col Close all appli	the created collect lected application This feature is us cation is communication of the comm	ted application(s) in the def or can be run from the deskt seful for distributed applica nicating (via Ethernet UDP/I	fined sequence. op while another project i tions. E.g. a collected P) with a remote device

4. Select the name you gave the Collected Application, Click "OK"

Open application	x
Application name	
001_Target_For_Doc_COLLECTED	
Application parent directory	
C:\CandM\Working_4_2_1\CollectedApplications	
Application directory:	
C:\CandM\Working_4_2_1\CollectedApplications\001_Target_For_Doc_COLLECTED	
OK Cancel	

5. If everything went well, you should watch the HMI load, the project is running on the MACC, and you can use the HMI to control it.

