CONTROLLER INFORMATION SHEET

Maple Model(s) Graphic HMIs <u>PLC or Controller</u> Beckhoff Embedded PC



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Summary

Maple Systems Graphic HMIs communicate with Beckhoff Embedded PC controllers and allow the Graphic HMI to act as the master in a point-to-point single master, multiple slave format.

Communications Cable

The Graphic HMI should be connected to the device's Ethernet port.

Some controllers require straight through 10baseT Ethernet cables and others require crossover 10baseT Ethernet cables. A list of cables offered by Maple Systems as well as cable assembly instructions to assist you in assembling your own Ethernet cable is available on our website.

WARNING *If your communications cable is not wired exactly as shown in our cable assembly instructions, damage to the HMI or loss of communications can result.*

Controller Settings:

For TwinCAT:

1. Confirm the PC IP address.

working Sharing	General
ionnect using:	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Configure	Obtain an IP address automatically O Use the following IP address:
Initial Client for Microsoft Networks Initial Client for Microsoft Networks Initial Client for Microsoft Networks Initial Client for Microsoft Networks	IP address: 169 . 254 . 56 . 12
QoS Packet Scheduler	Subnet mask: 255 . 255 . 0 . 0
Elle and Printer Sharing for Microsoft Networks A- Internet Protocol Version 6 (TCP/IPv6)	Default gateway:
	Obtain DNS server address automatically O Use the following DNS server addresses:
Install Uninstall Properties	Preferred DNS server:
Description Transmission Control Protocol/Internet Protocol, The default	Alternate DNS server:
wide area network protocol that provides communication across diverse interconnected networks.	Validate settings upon exit

2. Open TwinCAT and set the IP address (for this example, 169.254.56.12.1.1).

	Pa B B A B H m ✓ # & & & S V B A B C B W 2 V	General System AMS Router PLC Registration
 G STSTEM - Configuration FLC - Configura	Othersil Boot Settings VeinCAT System Manager V2.11 (Build 1563) VeinCAT P1 C V2.11 (Build 1549) time Imide to: 2011/501 Copyright BECKBOFF @ 1996-2010 Mms/Never beckboff com Mms/Never beckboff com Registension: Name: Mane: ml Company: company: Reg.Stey: 47EE-4A13-37CE-9CFC	General Svitem AMS Notiker Local Computer AMS Net Id: 169 254 56 12 1 1 Remote Computers TEST_STATION Add Remove Properties

3. Use TwinCAT to build a Route Table to make sure the system is connected. If PLC power turn OFF and then ON, repeat this step. **Note:** When the "X" is displayed under "Connected," the connection succeeded.

Enter Host Name / IP:			Refresh Status	Bro	padcast Search
Host Name	Connected	Address	AMS NetId	TwinCAT	OS Version
cs-PC		169.254.56.12	169.254.56.12.1.1	2.11.1539	Win Vista
TEST_STATION	X	169.254.56.205	169.254.56.205.1.1	2.10.1341	Win CE (5.0)
•		m			
	TEST_ST		Route Name (Remote)	: CS-PC	
Route Name (Target):	2/1 (S 10) (- 10)		Route Name (Remote) Ziel Route		ote Route
Route Name (Target): AmsNetId:	2/1 (S 10) (- 10)	TATION	Ziel Route	Remo	ote Route eine
Route Name (Target): AmsNetId: Transport Typ:	169.254.5 TCP/IP	FATION 56.205.1.1	Ziel Route ⑦ Projekt ④ Static	Remo © K @ S	ote Route eine tatic
Route Name (Target): AmsNetId: Fransport Typ: Adressen Info:	169.254.5	FATION 56.205.1.1	Ziel Route	Remo © K @ S	ote Route eine
Route Name (Target): AmsNetId: Transport Typ: Adressen Info:	169.254.5 TCP/IP TEST_ST	FATION 56.205.1.1	Ziel Route ⑦ Projekt ④ Static	Remo © K @ S	ote Route eine tatic

4. Open EZwarePlus. Select "Beckhoff Embedded PC" in the System Parameters > Device Properties window.

Name .	Beckhoff Embedded PC
	⊘ HMI
Location :	Local Settings
PLC type :	Beckhoff Embedded PC
	V.1.40, EMBEDDED_PC_BECKHOFF_CX_ARM.e30
PLC I/F :	Ethernet 🔹
	Use UDP (User Datagram Protocol)
	use upp (user patagram Protocol)
	PLC default station no. : 1
	Default station no. use station no. variable
	Use broadcast command
	How to designate the station no. in object's address ?
Inter	val of block pack (words) : 5
	val of block pack (words) : 5

5. Open the "IP Address Settings" window and set the PLC IP address, TCP Port no. (48898 recommended), ADS port, and AMS NetID.

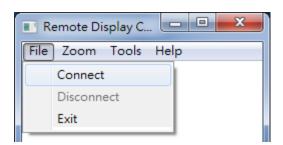
IP address :	169	. 254	. 56	. 205		
Port no. :					ADS port :	801 -
			_			
AMS NetId :	0 :	0 :	0 :	0 : 1	: 1	
Timeout (sec) :	1.0	•	Tu	ırn around	delay (ms) :	0
		The nur	nber of	resending	commands :	0 •

6. Run the on-line simulation.

Note: If the project is downloaded to the HMI, set the HMI IP address to match the TwinCAT IP address setting (in this example, 192.254.56.12).

For CERHOST:

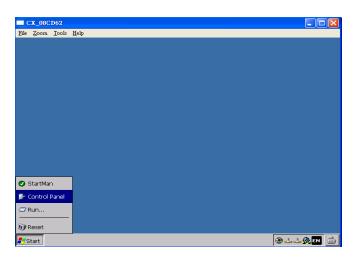
1. Execute CERHOST.exe to connect the PC to the PLC.



2. Enter the PLC IP address and password (default password = 1). Click OK.

Connect
Hostname: 192.168.1.101 Password: ×
OK Cancel

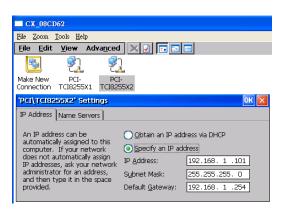
3. To confirm connection with PLC, click the Start menu and select "Control Panel."



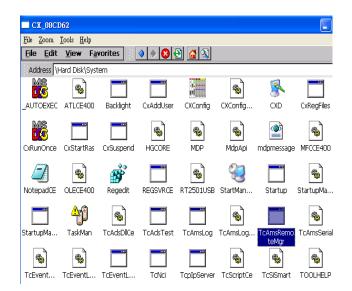
4. Select "Network and Dial-up Connections" to display the PLC device information.



5. Select the PLC to check its IP address.



6. Access the PLC system settings (default directory: \Hard Disk\System). Execute "TcAmsRemoteMgr."



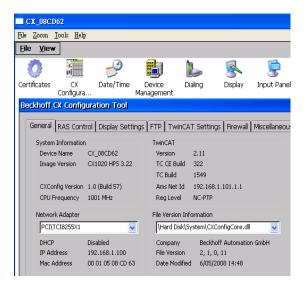
7. The AMS Net Id consists of six numbers separated by periods. The first four numbers represent the IP address followed by "1.1." The figure below shows the AMS Net Id of the Local Computer. The "Remote Computers" shows the information for the HMI that the PLC will connect with. Click "Add" to add the HMI to the list.

AMS Remote Connections
Local Computer
AMS Net Id: 192.168.1.101.1.1
Remote Computers
Weintek-HMI
Add Remove Properties

8. Add the Device Name, AMS Net Id, IP address of the HMI, Transport, and select the "Slow Connection" checkbox.

Add Remote C	onnection 🛛 🛛
Name:	Weintek-HMI
AMS Net Id:	192.168.1.206.1.1
Address:	192.168.1.206
Transport:	TCP/IP
	Slow Connection
ОК	Cancel

9. Return to the Control Panel and execute "CX Configuration Tool" to confirm the PLC AMS Net Id.



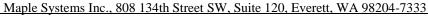
10. Confirm settings and click Start > Reset PLC.

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le <u>Z</u> oom	Tools F	ielp				
) StartMan						
) StartMan						
Control P						
Control P						

Import Tags

This driver can import TPY tags generated by the TwinCAT PLC Control software application. 1. Click the "Import Tag" button in the EZwarePlus System Parameters > Device List.

X System Parameter Settings Extended Memory Printer/Backup Server Recipes Time Sync./DST e-Mail Device Model General System Setting Security Font Device list : No. Name Location Device type Interface I/F Protocol Local HMI Local HMI HMI5070L/HMI. Local Beckhoff Embe Local PLC 4 Loca • New... Delete Settings. Import Tag. Project description : SCADA software can indirectly access PLC data via MODBUS TCP/IP Server on HMI. (Add a MODBUS TCP/IP Server first and enable [MODBUS TCP/IP Gateway]) s Mapping Tabl OK Cancel Help



2. Select the TPY file and click "Open."



3. The file is imported into the Address Tag Library in EZwarePlus.

🎉 TwinCAT PLC Control - test.pro* - [MA	IN (PRG-LD)]
🧱 File Edit Project Insert Extras Online	<u>W</u> indow <u>H</u> elp
POUS I MAIN (PRG)	0001 PROGRAM MAIN 0002 VAR 0003 1 bMemFlag AT%MX0.0:BOOL; 0004 2 value1 AT%MW0:INT; 0005 3 value2 AT%MD2:REAL; 0006 4 0007 5 1 bnutValue3 AT%MW3:WORD; 0008 4 0009 5 1 nputValue1 dimen AT%MW4: ARRAY[0100] OF INT; 0009 1 0009 1 0009 1 0001 END_tVAR

		N				ALC: NOT
No.	Address tag name	PLC name	Addre	Address	Read/W	
1	MAIN.bMemFlag	Beckhoff ADS/AMS (Bit	MX-0	Read/	and a second
2	MAIN.Value1	Beckhoff ADS/AMS (Word	MW-0	2 Read/	
3	MAIN.Value2	Beckhoff ADS/AMS (Word	MD-2	Read/	
4	MAIN.Value3	Beckhoff ADS/AMS (Word	MW-3 4	4 Read/	
5	MAIN.InputValue1dimen[0]	Beckhoff ADS/AMS (Word	MW-4 🕳	5 Read/	
6	MAIN.InputValue1dimen[1]	Beckhoff ADS/AMS (Word	MW-6	Read/	
7	MAIN.InputValue1dimen[2]	Beckhoff ADS/AMS (Word	MW-8	Read/	
8	MAIN.InputValue1dimen[3]	Beckhoff ADS/AMS (Word	MW-10	Read/	
9	MAIN.InputValue1dimen[4]	Beckhoff ADS/AMS (Word	MW-12	Read/	
10	MAIN.InputValue1dimen[5]	Beckhoff ADS/AMS (Word	MW-14	Read/	
11	MAIN.InputValue1dimen[6]	Beckhoff ADS/AMS (Word	MW-16	Read/	
12	MAIN.InputValue1dimen[7]	Beckhoff ADS/AMS (Word	MW-18	Read/	
13	MAIN.InputValue1dimen[8]	Beckhoff ADS/AMS (Word	MW-20	Read/	
14	MAIN.InputValue1dimen[9]	Beckhoff ADS/AMS (Word	MW-22	Read/	
15	MAIN.InputValue1dimen[10]	Beckhoff ADS/AMS (Word	MW-24	Read/	
16	MAIN.InputValue1dimen[11]	Beckhoff ADS/AMS (Word	MW-26	Read/	
17	MAIN.InputValue1dimen[12]	Beckhoff ADS/AMS (Word	MW-28	Read/	
18	MAIN.InputValue1dimen[13]	Beckhoff ADS/AMS (Word	MW-30	Read/	

4. When importing the TPY tag file, a dialog box appears that allows you to select all or part of the data being imported.

Note: The comment field is not imported into EZwarePlus.

Address tag name	Address type	addama	Comment
devaceDown	Bit	QX-2	Value3
deviceUp	Bit	QX-1	Vebue2
sugar	Bit	QX-0	¥alue1

5. When assigning a tag in the address field of an object, click the "Setting" button in the Read address and select the "User-defined tag" checkbox.

New Bit Lamp Object	Address	
General Security Shape Label Description : Read address PLC name : Embedded PC (BECKHOFF) Setting Address : IX 0	PLC name : Embedded PC (BECKHOFF) Device type : MAIN.test1 Address : D<-0 Address format : DDDDo [range : 0 ~ 14077, o : bit no. : 0 ~ 7] ☐ Index register	v v
Invert signal	Tag Library OK	Cancel

Accessible PLC Memory

Register Memory

The following table lists the controller's register memory ranges that the Graphic HMIs are able to access. Please note that your controller's memory range may be *smaller* or *larger* than that supported by these HMIs. The following register memory can be displayed in 16, 32, or 64 bit format on the Graphic HMI.

Controller Register Type	Address Range	Format	Controller Register Description
IW	0 - 65535	ddddd	Input Registers
QW	0 - 65535	ddddd	Output Registers
MW	0 - 65535	ddddd	Data Registers
ID	0 - 65535	ddddd	Input Registers (DW)
QD	0 - 65535	ddddd	Output Registers (DW)
MD	0 - 65535	ddddd	Data Registers (DW)

Discrete Memory

The following table lists the controller's discrete memory ranges that the Graphic HMIs are able to access. Please note that your controller's memory range may be *smaller* or *larger* than that supported by these HMIs. The following discrete memory is displayable in single-bit format on the Graphic HMI.

Controller Bit Type	Address Range	Format	Controller Bit Description
IX	000 - 6553515	ddddbb	Bits within Input Registers
QX	000 - 6553515	ddddbb	Bits within Output Registers
MX	000 - 6553515	ddddbb	Bits within Data Registers

(Note: d = decimal; b = bits (00-15))

EZware Settings

The following table lists the communications settings that must be configured in EZware. These settings can be found in the *Edit-System Parameters* menu under the *PLC Settings > Device Properties*. Please note:

- The **Recommended Settings** column provides the recommended setting based upon default settings most commonly use in Devices which use Modbus TCP/IP
- The **Options** column lists EZware's options; your controller may not support every option

Name	Recommended Settings	Options	Important Notes
Name:	Beckhoff Embedded PC		Description label
HMI or PLC	PLC		
Location	Local	Local; Remote	Select <i>Local</i> if PLC directly connected to HMI; <i>Remote</i> if PLC connected thru another HMI.
PLC type:	Beckhoff Embedded PC		
PLC I/F:	Ethernet	Ethernet	
Settings: IP Address:	xxx.xxx.xxx	0.0.0.0 - 255.255.255.255	Use the IP Address assigned to the controller.
Settings: Port	48898	0-65535	Use 48898.
Settings: ADS port	801	300, 800, 801, 811, 821, 831, 851, 852, 853, 854	
Settings: AMS NetId	xxx.xxx.xxx.1.1		IP address + 1.1
Settings: Timeout (sec)	1	0.1-25.5	Adjust if longer timeout is required.
Settings: Turn around delay (ms)	0	0-1000	Timeout period between HMI polls.
Settings: Send ACK Delay:	0		Not Applicable
Settings: Use UDP	Unchecked	Checked or Unchecked	Must be Unchecked
PLC default station no.:	1	0-255	Must match the node address assigned to the PLC.

Name	Recommended Settings	Options	Important Notes
Default station no. use station no. variable	Unchecked		Optional
Use broadcast command	Unchecked		Not Applicable
Interval of block pack (words):	5	0-512	See Help – Optimizing the Update Rate with PLC Block Pack
Max. read-command size (words):	256	1 - 512	Max number of words for a read command
Max. write command size (words):	2	1-512	Max number of words for a write command