Hardware User Manual

EA9-RHMI-USER-M

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HARDWARE USER MANUAL

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Please include the Manual Number and the Manual Issue, both shown below, when communicating with Technical Support regarding this publication.

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1st Edition Rev. A	09/19	Revised touchscreen specification
1st Edition Rev. B	10/19	Revised system status LED information
1st Edition Rev. C	11/19	Revised system status LED information and Video Out Specifications
1st Edition Rev. D	12/19	Revised system status LED information
1st Edition Rev. E	04/20	Added Compatible Touch Screens and Troubleshooting
1st Edition Rev. F	06/20	Revised Appendix C
1st Edition Rev. G	01/21	Added support for pCap touch screens
1st Edition Rev. H	08/21	Revised cable photos
1st Edition Rev. J	09/21	Added Touch Screen troubleshooting
1st Edition Rev. K	12/21	Revised compatible monitor list
1st Edition Rev. L	05/22	Added touch screen monitor compatibility note
1st Edition Rev. M	04/23	Updated multiple cable diagrams
1st Edition Rev. N	05/23	Revised Software CD to USB
1st Edition Rev. P	07/23	Corrected CLICK protocol list
1st Edition Rev. Q	02/24	Minor corrections

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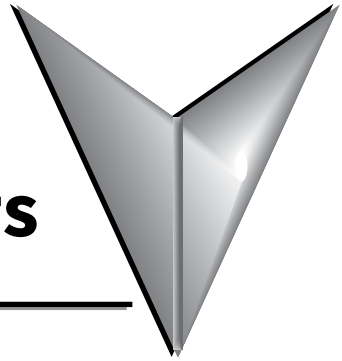

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Getting Started

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Introduction

1

The Purpose of This Manual

Thank you for purchasing our ***C-more***® human-machine interface (HMI) family of products. This manual describes AutomationDirect.com's ***C-more*** headless HMI, its specifications, included components and available accessories and provides you with important information for installation, connectivity and setup. The manual shows you how to install, wire and use the product. It also helps you understand how to interface the HMI to other devices in a control system.

This user manual contains important information for personnel who will install the HMI and accessories and for the personnel who will be programming the HMI. If you understand control systems that make use of operating interfaces such as the ***C-more*** RHMI, our user manuals will provide all the information you need to get and keep your system up and running.

Supplemental Manuals

If you are familiar with industrial control type devices, you may be able to get up and running with just the aide of the Quick Start Guide that is included with each HMI. You should also refer to the On-line help that is available in the ***C-more*** programming software for more information about programming the panel.

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http://c-more.automationdirect.com

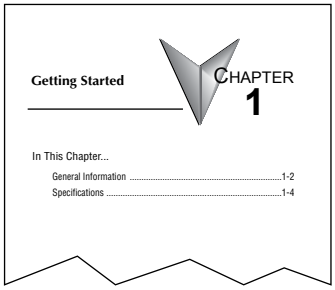
Conventions Used

*When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. The word **NOTE:** in boldface will mark the beginning of the text.*

When you see the "exclamation mark" icon in the left-hand margin, the paragraph to its immediate right will be a warning. This information could prevent injury, loss of property, or even death (in extreme cases). The word Warning: will mark the beginning of the text.

Key Topics for Each Chapter

The beginning of each chapter will list the key topics that can be found in that chapter.



Product Overview

Some of the features designed into the product to provide excellent hardware and software are listed below.

- Drivers for ELO Single Touch Resistive/SAW, EETI eGalax Single Touch Resistive and single-touch Protected Capacitive touch screens that can be used with many touch capable industrial touch monitors
- Plenty of memory and methods to get data in/out of the panel
- Overlapping active devices on the screen
- 65,536 colors for enhanced graphics
- HDMI Video Output supporting several resolutions including 720p (60Hz) and Audio
- Built-in FTP client/server, E-mail client, and Web server
- User configurable LED on the front of the unit
- Built-in project simulation; test on PC while developing
- Ethernet 10/100 Base-T communications
- 15-pin serial port with RS-232, RS422/485
- 3-wire terminal block RS-485 port
- Programming via USB or Ethernet
- Animation of bitmaps and objects
- Thousands of built-in symbols and Windows fonts
- PID face plate, trending, alarming and a recipe database
- Trend Data Logging
- Event Manager to trigger actions based on assigned state changes, schedules, PLC tag names, etc. set up in a database environment. The event can also trigger a sound byte, initiate a screen capture, send a data file (FTP), send an E-mail, etc.
- Internet Remote Access

Quick Start Steps

Step 1 – Unpack and Inspect

a.) Unpack the ***C-more*** RHMI from its shipping carton. A Quick Start Guide is included in the carton.

b.) Unpack any accessories that have been ordered, such as programming cable, communications cable, etc.

c.) Inspect all equipment for completeness. If anything is missing or damaged, immediately call the AutomationDirect® returns department @ 1-800-633-0405.

Optional Accessories

Communication Expansion Module EA-ECOM

SD Memory Card EA-SD-CARD

USB Pen Drive USB-FLASH

DSUB Port Adapter EA-COMCON-3A

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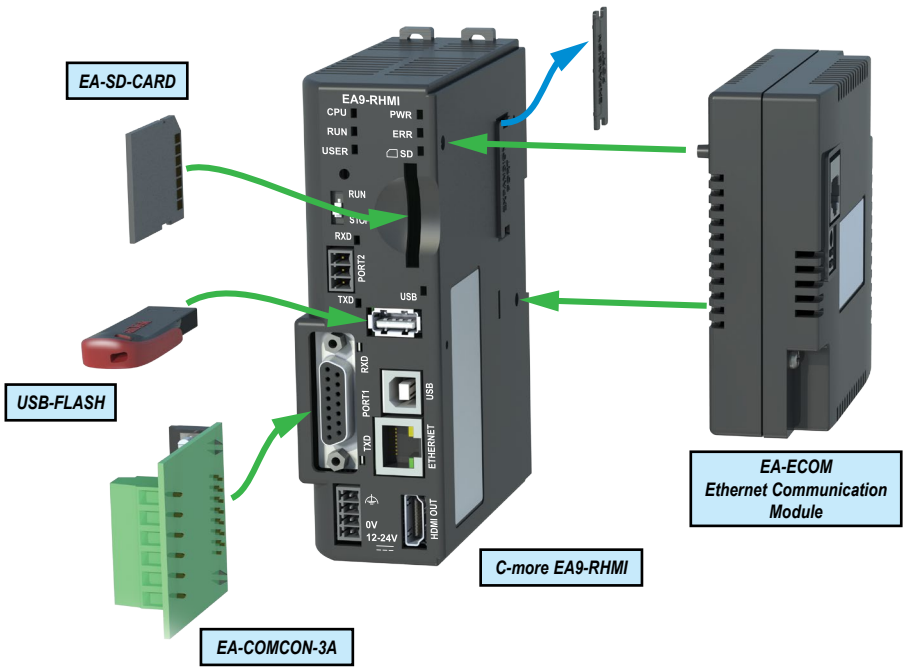
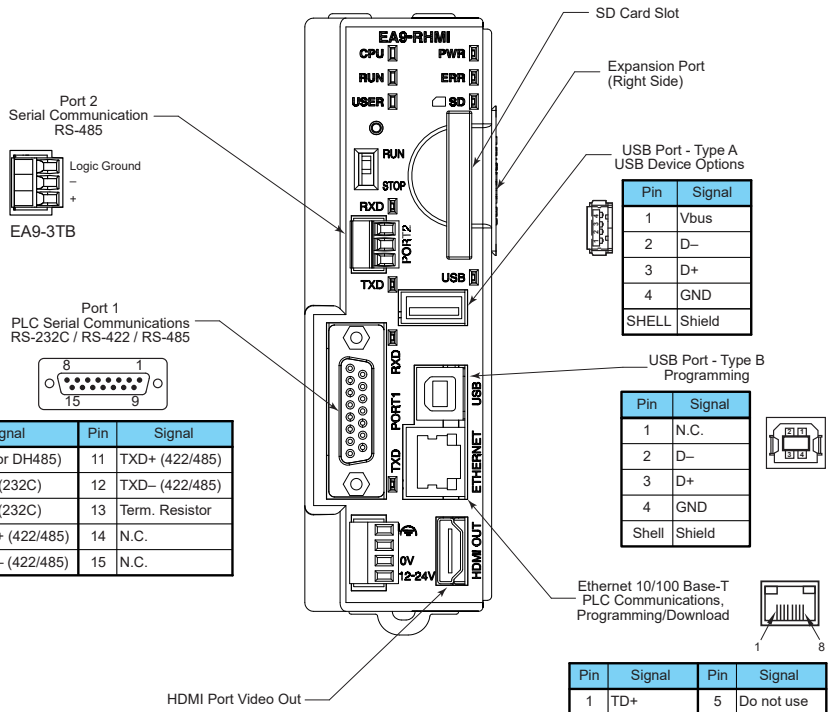
Step 2 – Install Optional Hardware Accessories



Step 3 – Become Familiar with Available Communication Ports



Pin	Signal
1	Vbus
2	D–
3	D+
4	GND
SHELL	Shield

Pin	Signal
1	N.C.
2	D–
3	D+
4	GND
Shell	Shield

Pin	Signal	Pin	Signal	Pin	Signal
1	Frame GND	6	LE (for DH485)	11	TXD+ (422/485)
2	TXD (232C)	7	CTS (232C)	12	TXD– (422/485)
3	RXD (232C)	8	RTS (232C)	13	Term. Resistor
4	N.C.	9	RXD+ (422/485)	14	N.C.
5	Logic GND	10	RXD– (422/485)	15	N.C.

Pin	Signal	Pin	Signal
1	TD+	5	Do not use
2	TD–	6	RD–
3	RD+	7	N.C.
4	do not use	8	N.C.

NOTE: *See Chapter 6: PLC Communications for additional details on the available communication ports, protocols and cables.*

Step 4 – Install the Programming Software and Develop a Project

Download the latest version of the ***C-more*** Programming Software, p/n EA9-PGMSW, from the Automationdirect website. Alternately, if the ***C-more*** Programming Software USB is available, you may install from the software USB. Refer to the AutomationDirect website for current minimum system requirements for installation.

For software download installation, follow the screen prompts to download and install the ***C-more*** Programming Software.

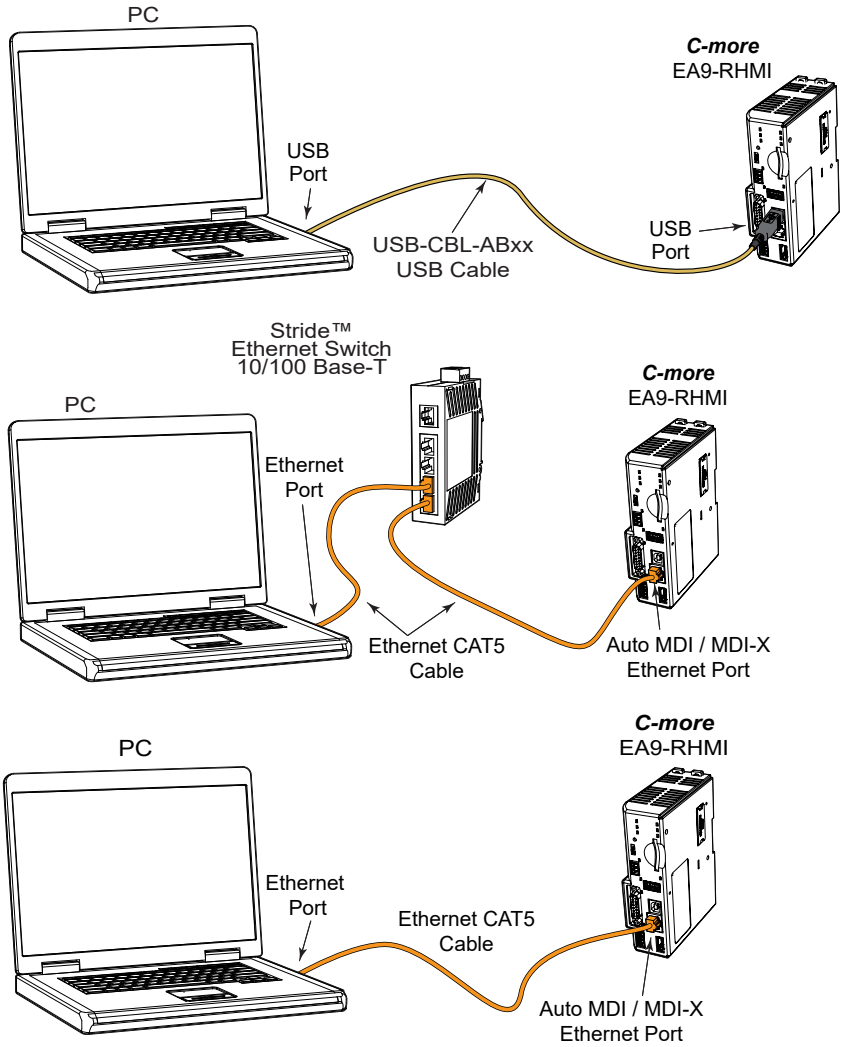
For USB installation, insert the supplied USB into the PC's USB port and navigate to the USB drive location on the PC. Double-click on *EA_Setup.exe* and follow the instructions. If you need assistance during the software installation, call the AutomationDirect Technical Support team @ 770-844-4200.

NOTES: *Regarding Ethernet access to a C-more panel.*
If you intend to take advantage of the methods of remote access to the panel, including the web server, PC remote access, FTP, iOS or Android app, you need to consider the security exposure in order to minimize the risks to your process and your C-more panel.

Security measures may include password protection, changing the ports exposed on your network, including a VPN in your network, and other methods. Security should always be carefully evaluated for each installation. Refer to Appendix C - Security Considerations for Control Systems Networks.

Step 5 – Connect HMI to Computer

- Connect a USB Programming Cable, such as p/n USB-CBL-AB15, from a USB type A port on the PC to the USB type B programming port on the ***C-more*** HMI.
- Or connect the ***C-more*** EA9-RHMI and PC together either directly or via an Ethernet switch and CAT5 Ethernet cables



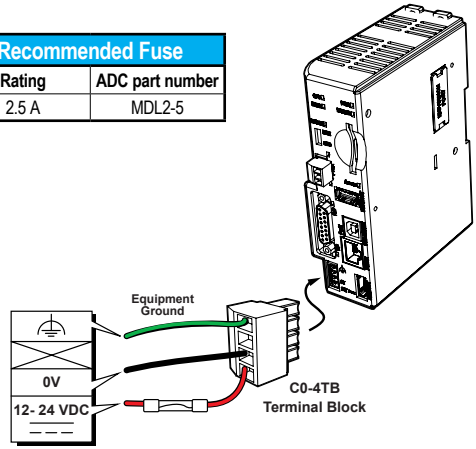
Step 6 – Provide Power to the HMI

- **Connect** a **dedicated** 12-24 VDC Class 2 power supply to the DC connector on the front of the ***C-more*** EA9-RHMI. Make sure to connect the ground terminal to a proper equipment ground.
- **Then** turn on the power source and check the LED status indicators on the front of the ***C-more*** EA9-RHMI for proper indication (see next page).

NOTE: *A dedicated power supply is recommended. If the power supply also feeds inductive loads such as solenoids or relays, the transients caused by these loads can affect the operation of or cause damage to HMI components.*

DC Power Wiring

Recommended Fuse	
Rating	ADC part number
2.5 A	MDL2-5

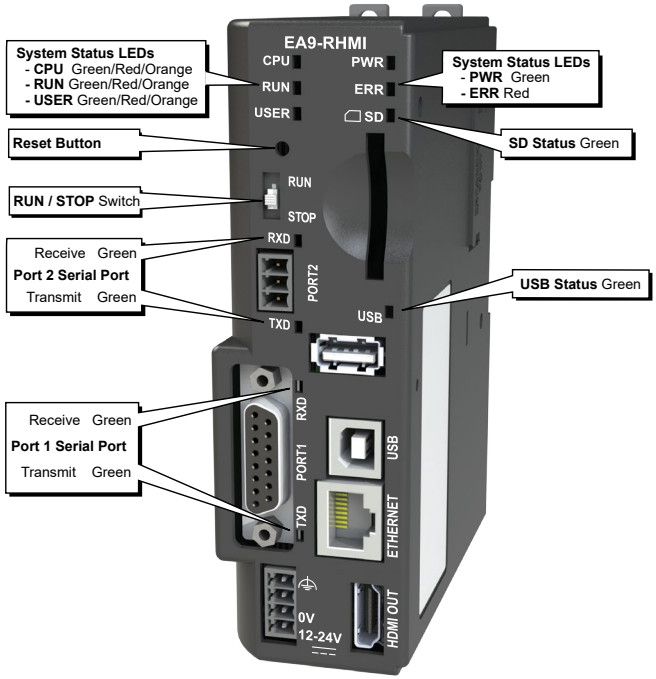


Tightening Torque	
Power supply cable torque	32-35 oz-in (0.22-0.25 Nm)

Warning: Use 60/75°C copper conductors only.

Step 6 – Provide Power to the HMI (cont'd)

C-more LED Status Indicators



System Status LEDs				
	LED / State	CPU	RUN	ERR
Status	Loading OS	Blinking Green (0.5s)	OFF	OFF
	CPU Running Normal	Green	–	OFF
	Project Loaded and Running	–	Green	–
	No User Project	–	Orange	–
	Password Required	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Errors	Power Loss Detection	Blinking Orange (0.2s)	–	–
	Memory Error	Red	OFF	Red
	OS Error	Blinking Orange (0.5s)	OFF	Red
	Watch Dog Time Out	Blinking Red (0.5s)	–	Red
	No Log Storage Found	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
	General Error*	–	Red (0.5s)	Blinking Red (0.5s)
	Warning*	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Mode	Recovery Mode	Blinking Orange (0.5s)	OFF	OFF
	Safe Mode	Orange	OFF	Red

**Note - See Chapter 8 - Troubleshooting for General Error and Warning explanations.*

EA9-RHMI Beep

Beep Functions	
Function	***Beep Pattern***
Boot	1-long, 2-short
Boot Error*	3-long
HDMI Connected	3-short
Reset to Factory Defaults	14 short beeps progressively closer together followed by 1-long beep.
Blink Screen	5-long

Boot Errors

- ***Multiple Projects***
- ***Write Protected SD Card***
- ***No Log Storage Found***
- ***System Screen (RUN/STOP switch in STOP position)***
- ***Password Protected***

Reset Button

Reset Button		
Push Action	***Behavior***	***Note***
Push for <15 seconds	Reboot the EA9-RHMI	
Push for >15 seconds	Reset to factory default	The project is cleared and all settings are initialized.
While holding down the reset button, power on the EA9-RHMI and continue holding the button for >15 seconds	System recovery mode	The CPU LED will blink ORANGE. See “No System Found” in Chapter 8 - Troubleshooting

RUN / STOP switch

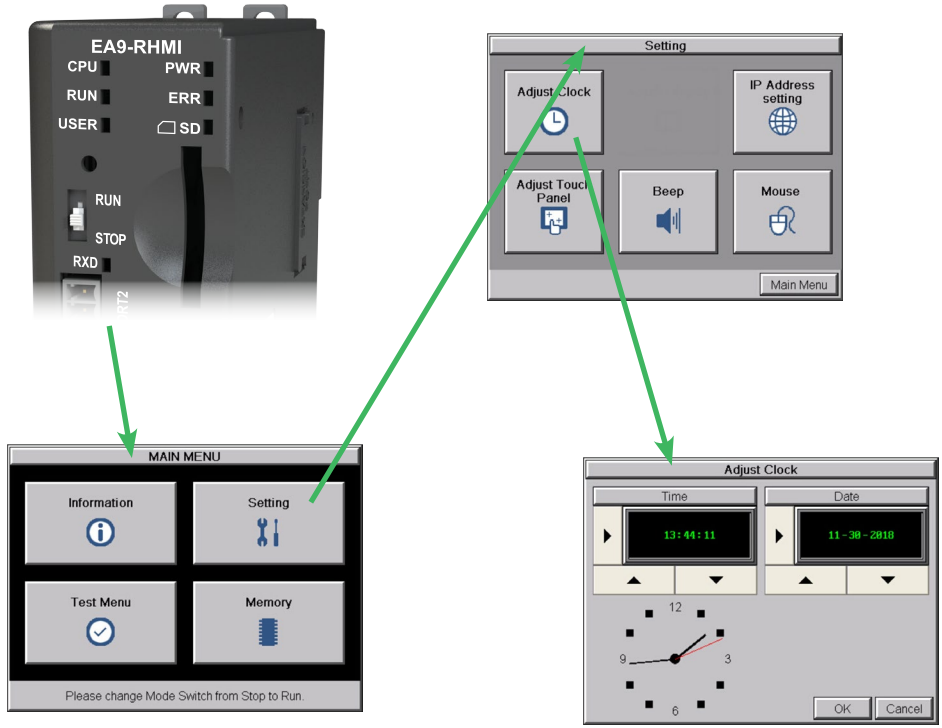
RUN / STOP Switch		
Position	***Behavior***	***Note***
RUN	Project will run if present and the RUN LED will be green	If no project is loaded in the HMI, the message “No User Program” will be displayed on a connected display. The RUN LED will be orange.
STOP	The project and any logging stops and the System Screen is displayed.	If a password has been set up for the System Screen, the RUN LED will blink orange.
Power on the EA9-RHMI while in the STOP position	The System Screen is displayed	A System Screen password is ignored.

User Defined LED

The user defined LED on the EA9-RHMI can be controlled from the project to illuminate red, green or orange. It can also be configured to blink these colors. Refer to the online help file provided with the programming software for details.

Step 7 – Access the EA9-RHMI Setup Screens

- Access the Main Menu of the EA9-RHMI System Setup Screens by changing the selector switch on the front of the unit to STOP.
- Adjust the time and date for the panel by pressing the Setting button on the Main Menu. Then press the Adjust Clock button on the Setting screen.
- Use the right-pointing arrows for the time or date display to select the unit to change. Use the up and down arrows to increment or decrement the value for the selected unit.
- Press OK when done to accept the changes to the time and date in the HMI or press Cancel to exit the Adjust Clock setup screen without making any changes.
- Press the Main Menu button on the Setting screen and then the Exit button on the Main Menu screen to return to the application screen.
- Change the selector switch on the front of the unit to RUN.



NOTE: *For more information on EA9-RHMI setup screens, see Chapter 5 - System Setup Screens.*

Step 8 – Choose HMI to Device Cable

The table below shows the PLCs, controllers and protocols supported by the EA9-RHMI. Ensure your controller and protocol are supported.

PLC Protocol Table			
Model			**Protocols**
AutomationDirect	Productivity Series		Productivity Serial
			Productivity Ethernet
	Do-more (BRX)	All	Do-more Serial
			Do-more Ethernet
	CLICK	All	CLICK Serial
		C0-1x series	CLICK Ethernet
	CLICK PLUS	C2-01CPU-x, C2-03CPU-x, All with C2-DCM	CLICK Serial
		All	CLICK Ethernet
	DL05/DL06	all	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		H0-ECOM/H0-ECOM100	***Direct*** LOGIC Ethernet
	DL105	all	K-Sequence
	DL205	D2-230	K-Sequence
		D2-240	K-Sequence
			Direct NET
		D2-250/D2-250-1/D2-260/D2-262	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		D2-240/D2-250-1/D2-260 Using DCM	***Direct*** NET
			Modbus (Koyo addressing)
		H2-ECOM/H2-ECOM100	***Direct*** LOGIC Ethernet
	DL305	D3-330/330P (Requires the use of a Data Communications Unit)	***Direct*** NET
		D3-340	***Direct*** NET
		D3-350	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D3-350 DCM	***Direct*** NET
			Modbus (Koyo addressing)
	DL405	D4-430	K-Sequence
			Direct NET
		D4-440	K-Sequence
			Direct NET
		D4-450/D4-454	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		All with DCM	***Direct***NET
			Modbus (Koyo addressing)
		H4-ECOM/H4-ECOM100	***Direct*** LOGIC Ethernet
	H2-WinPLC (Think & Do) Live V5.2 or later and Studio any version		Think & Do Modbus RTU (serial port)
	H2-WinPLC (Think & Do) Live V5.5.1 or later and Studio V7.2.1 or later		Think & Do Modbus TCP/IP (Ethernet port)
	GS Drives		GS Drives Serial
			GS Drives TCP/IP (GS-EDRV)
	SOLO Temperature Controllers (models with serial communications)		SOLO Temperature Controller

Step 8 – Choose HMI to Device Cable (cont'd)

PLC Protocol Table (cont'd)		
Model		**Protocols**
Allen-Bradley	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-01/02/03	DH485/AIC/AIC+
	MicroLogix 1000, 1100, 1200, 1400 and 1500	DF1 Half Duplex; DF1 Full Duplex
	SLC 5-03/04/05	
	ControlLogix™, CompactLogix™, FlexLogix™	
	PLC-5	DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Tag Based	DF1 Half Duplex; DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Generic I/O Messaging	EtherNet/IP Server
	ControlLogix, CompactLogix, FlexLogix - Tag Based	EtherNet/IP Client
	MicroLogix 1100, 1400 and SLC 5/05, via native Ethernet port	
	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-03/04/05, all via ENI adapter	
	Micro 800 Series	Modbus RTU
		Modbus TCP
	Micro 800 Series - Tag Based	DF1 Full Duplex
		EtherNet/IP Client
Modbus RTU	Modbus RTU devices	Modbus RTU
Modbus TCP/IP	Modbus TCP/IP devices	Modbus TCP/IP
GE	90/30, 90/70, Micro 90, VersaMax Micro	SNPX
	90/30, Rx3i	SRTP Ethernet
Mitsubishi	FX Series	FX Direct
	Q02, Q02H, Q06H, Q12H, Q25H	Q CPU
	Q, QnA Serial	QnA Serial
	Q, QnA Ethernet	QnA Ethernet
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx	Modbus RTU
	Other devices using Modicon Modbus addressing	Modbus RTU
		TUModbus TCP/IP
Omron	C200 Adapter, C500	Host Link
	CJ1/CS1 Serial	FINS
	CJ1/CS1 Ethernet	
Siemens	S7-200 CPU, RS-485 Serial	PPI
	S7-200 CPU, S7-300 CPU, S7-400, S7-1200 CPU Ethernet	Ethernet ISO over TCP

Step 8 – Choose HMI to Device Cable (cont'd)

Available cables to connect from PLC to *C-more* serial Port 1

To use Serial communication through Port 1 of the EA9-RHMI, consult the chart below for the proper cable. See Chapter 6: PLC Communications for wiring diagrams of additional user contructed cables.

Cable Description	Cable Part Number
Communication cable, 15-pin D-shell male to 6-pin RJ12, 9.8ft/3m cable length. For use with ***C-more*** or ***C-more*** Micro panel and AutomationDirect PLCs with RJ12 ports.	**EA-2CBL**
Communication cable, 15-pin D-shell male to 15-pin D-sub HD15 male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a DL06, D2-250(-1), D2-260 or D2-262 (bottom port) CPU.	**EA-2CBL-1**
Communication cable, 15-pin D-shell male to 6-pin RJ11, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a D3-340 CPU top or bottom port.	**EA-3CBL**
Communication cable, 15-pin D-shell male to 15-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a DL405 (top port) CPU.	**EA-4CBL-1**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a D2-DCM, D3-232-DCU, D3-350 (bottom port) or DL405 (bottom port) CPU.	**EA-4CBL-2**
Communication cable, 15-pin D-shell male to 8-pin mini DIN male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley Micrologix CPU.	**EA-MLOGIX-CBL**
Communication cable, 15-pin D-shell male to 9-pin D-shell female, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley SLC 5/03, 5/04 or 5/05 CPU with DF-1 port.	**EA-SLC-232-CBL**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley PLC-5 CPU with a DF1 port.	**EA-PLC5-232-CBL**
Communication cable, 15-pin D-shell male to 6-pin RJ45, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley SLC 5/01, 5/02 or 5/03 CPU with a DH485 port cable.	**EA-DH485-CBL**
Communication cable, 15-pin D-shell male to 15-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro and GE Fanuc Series 90/30 or 90/70 serial port.	**EA-90-30-CBL**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a Mitsubishi FX Series CPU.	**EA-MITSU-CBL**
Communication cable, 15-pin D-shell male to 8-pin mini DIN male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a Mitsubishi FX Series CPU.	**EA-MITSU-CBL-1**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Omron C200 or C500 CPU.	**EA-OMRON-CBL**

NOTE: *The above list of pre-made communications cables may be purchased. See* ***Chapter 6: PLC Communications*** *for wiring diagrams of additional user constructed cables. Chapter 6 also includes wiring diagrams for the pre-made cables.*

Pre-made cable examples

EA-2CBL

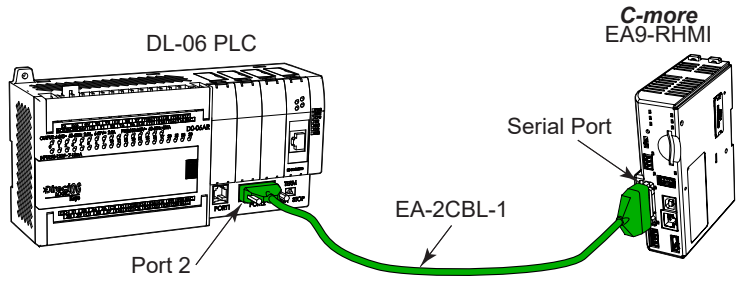
EA-2CBL-1

Step 9 – Connect HMI to PLC

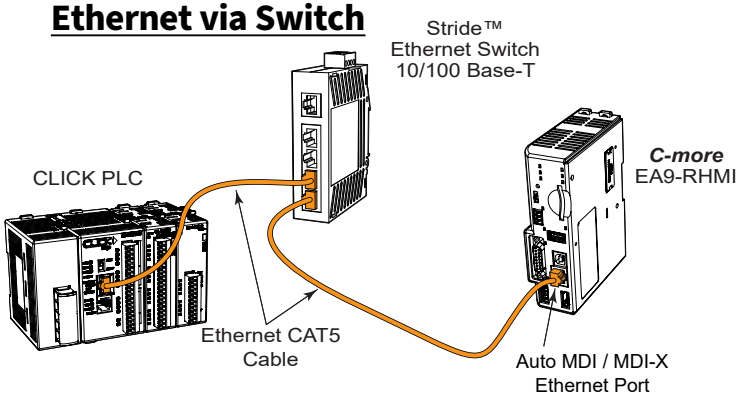
- Connect the serial communications cable between the ***C-more*** EA9-RHMI and the PLC
- **Or** connect the ***C-more*** EA9-RHMI and PLC together either directly or via an Ethernet switch and CAT5 Ethernet cables.

For further information on setting up communications between the EA9-RHMI and a PLC, see the ***C-more*** programming help file topic *CM129: Creating a New Project*.

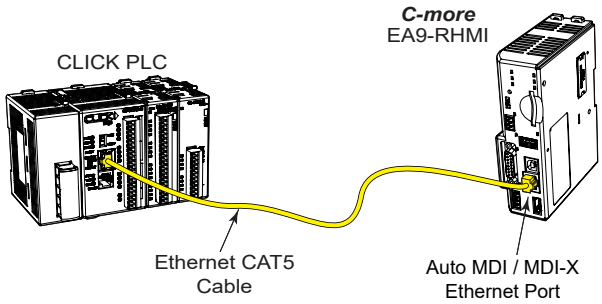
Serial



Ethernet via Switch



Ethernet



Specifications

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Specifications

The ***C-more***® RHMI Operator Interface is the next generation of HMI brought to you by AutomationDirect. It has been designed to display and interchange graphical data from a PLC by connecting a monitor and USB mouse or compatible touch screen or accessing screens remotely from a PC or smart device app.

EA9-RHMI Specifications	
Operating Temperature	0 to 50°C (32 to 122°F); Maximum surrounding air temperature rating: 50°C (122°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
Altitude	Up to 2000m (6562ft)
Storage Temperature	–20 to +60°C (–4 to +140°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Humidity	5–95% RH (non-condensing)
Environment	For use in Pollution Degree 2 environment, no corrosive gases permitted
Noise Immunity	(EN61131-2) EN61000-4-2 (ESD): 4kV (Contact Discharge) 2kV/4kV/8kV (Air Discharge) EN61000-4-3 (RFI): 10V/m (80MHz-1GHz), 3V/m (1.4GHz-2.0GHz) 1V/m (2.0GHz-2.7GHz) EN61000-4-4 (FTB): 2kV, positve/negative, 5kHz (DC power port) EN61000-4-5 (Surge): 0.5kV line to line 0.5kV line to earth EN61000-4-6 (Conducted): 10V, 0.15–80MHz EN61000-4-8 (Power frequency magnetic field immunity): 30A/m (Local test) RFI, (145MHz, 440MHz 10W @10cm) Impulse 1000V @ 1µs pulse
Withstand Voltage	1000VAC, 1 min. (FG to power supply)
Insulation Resistance	> 10M ohm @ 500VDC (FG to power supply)
Vibration	IEC60068-2-6 (Test Fc) 5-9Hz: 3.5mm amplitude, 9-150Hz 1.0G 10 sweep cycles per axis on each of 3 mutually perpendicular axes
Shock	IEC60068-2-27 (Test Ea) 15G peak, 11ms duration, 3 shocks in each direction per axis, on 3 mutually perpendicular axes

Specifications continued on next page

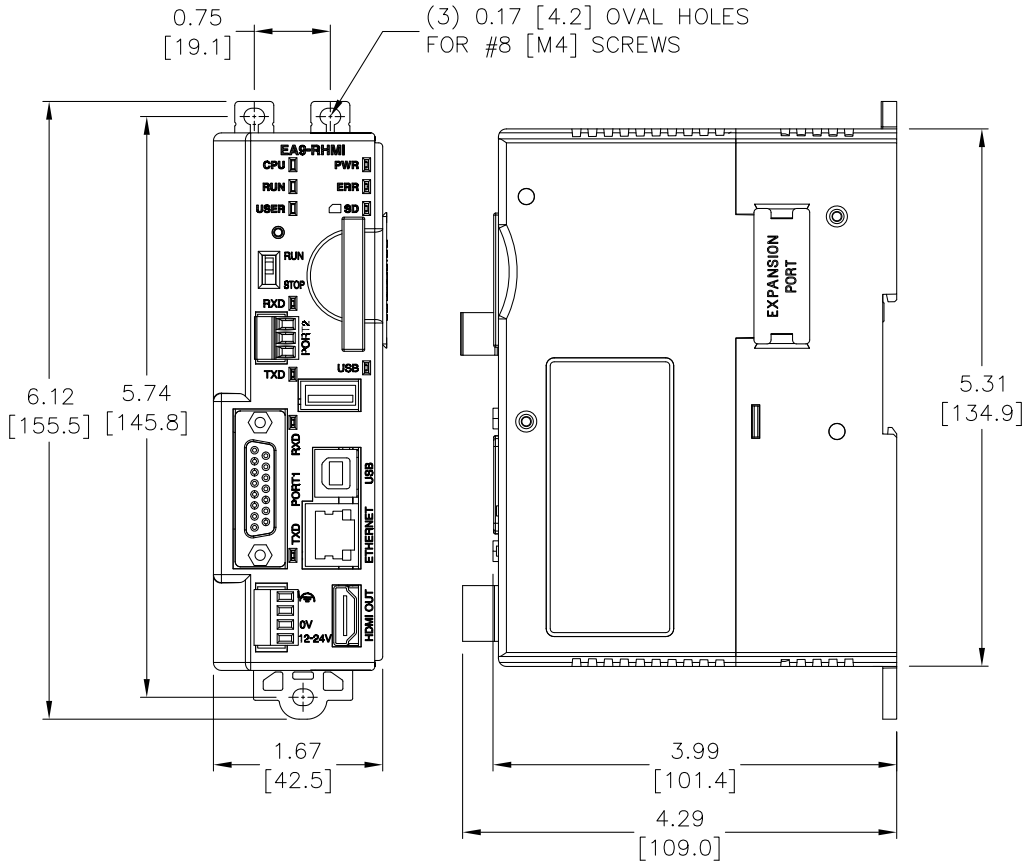
NOTE: *The touch screen driver is designed to respond to a single touch. If it is touched at multiple points at the same time, an unexpected object may be activated.*

EA9-RHMI Specifications (continued)	
Emission	EN55011 Class A (Radiated RF emission)
Supply Power	10.2-26.4 VDC Class2 or SELV (Safety Extra-Low Voltage) Circuit or Limited Energy Circuit (LEC), Reverse Polarity Protected
Weight	0.59 lb (269g)
Color Scale	65,536 colors
Project Memory	82MB
Number of Screens	Up to 999 screens – limited by project memory
Realtime Clock	Realtime Clock built into unit, backed up for 30 days at 25°C after power has been applied for 24 hours
Calendar - Month / Day / Year	Yes - monthly deviation 60 sec at 25°C
Serial Port 1	15-pin D-sub female - RS2342C, RS-422/485
Serial Port 2	3-wire terminal block - RS-485
USB Port - Type B	USB 2.0 High speed (480 Mbps) Type B - Download/Program Max cable length - 15 ft.
USB Port - Type A	USB 2.0 High speed (480 Mbps) Type A - for USB device options Max cable length - 15ft Bus Power – Less than 500mA at 5VDC
Supported Touch Screen	ELO™ Single Touch Resistive/SAW, EETI eGalax Single Touch Resistive and pCAP
Ethernet Port	Ethernet Port Ethernet 10/100 Base-T, auto MDI/MDI-X
SD Card Slot	1 slot. Supports max 2GB (SD,) max 32GB (SDHC)
HDMI Video Out	HDMI Type A Port
Power Consumption	12.0 W 1.0 A @ 12VDC 0.5 A @ 24VDC
Maximum Inrush Currnet	15A @ 1ms
Recommended Fuse	2.5 A (part no. MDL2-5)
Internal Fuse (non-replaceable)	4A
Agency Approvals	UL61010 (E157382), CE (EN61131-2), cUL Canadian C22.2, RoHS (2011/65/EU)

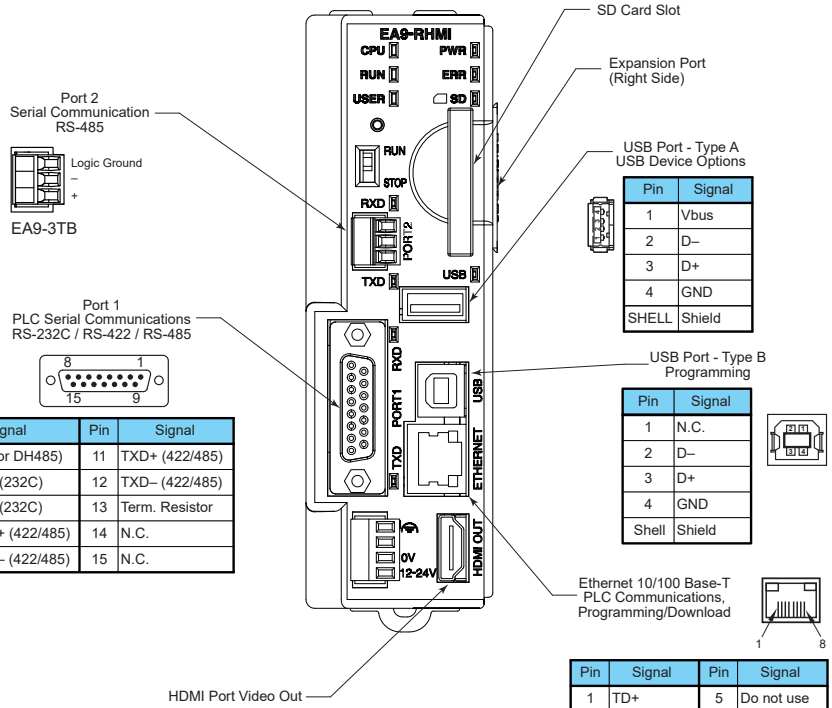
2

Dimensions

Inches [mm]



Communication Ports and Memory Expansion



Pin	Signal
1	Vbus
2	D–
3	D+
4	GND
SHELL	Shield

Pin	Signal
1	N.C.
2	D–
3	D+
4	GND
Shell	Shield

Pin	Signal	Pin	Signal	Pin	Signal
1	Frame GND	6	LE (for DH485)	11	TXD+ (422/485)
2	TXD (232C)	7	CTS (232C)	12	TXD– (422/485)
3	RXD (232C)	8	RTS (232C)	13	Term. Resistor
4	N.C.	9	RXD+ (422/485)	14	N.C.
5	Logic GND	10	RXD– (422/485)	15	N.C.

Pin	Signal	Pin	Signal
1	TD+	5	Do not use
2	TD–	6	RD–
3	RD+	7	N.C.
4	do not use	8	N.C.

HDMI Port Video Out

EA9-RHMI Video Out Specifications	
Resolution	SD - 720 x 480 HD - 1280 x 720 VGA - 640 x 480 XGA - 1024 x 768
Output	Video Data - Same Screen as Panel
Sound Pass Through	Does not support Mic sound Pass Through

Ethernet Port

The Ethernet port can be used several ways: for programming the unit (downloading a project), for PLC communication, and for the advanced features, such as sending e-mail, web server, FTP access, and allowing users to access and control the HMI remotely.

The Ethernet connector is an RJ-45 Module jack.

Refer to http://c-more.automationdirect.com for the latest driver information.

USB Type B Port

Program ***C-more*** via the USB programming port. It's fast and easy, with no baud rate settings, parity, or stop bits to worry about. We stock standard USB cables for your convenience, such as part no. USB-CBL-AB15. The USB type B port can be used to upload or download projects to and from a PC (personal computer).

USB Type A Port

The USB type A port is a standard feature for all models and can be used to connect various USB 2.0 HID (Human Input Device) devices to the HMI, such as:

- Industrial Monitor with a compatible touch screen or Mouse
- USB pen drives, (ADC p/n USB-FLASH)
- USB keyboards
- USB barcode scanners
- USB card scanners

C-more can log data to the USB pen drive as well as restore projects to the HMI from the pen drive. You can also back up project files and HMI firmware.

NOTE: *Output current is less than 500mA @ 5VDC.*

Sound Interface (HDMI)

When connected to an HDMI device that supports audio over HDMI, ***C-more*** can play warning sounds or pre-recorded messages such as "conveyor is jammed." Various "Objects" in the ***C-more*** programming software support sounds. ***C-more*** supports WAV type files. Sound files are stored in the sound library.

Serial Communication Ports

Port 1

Connect to your serial controller network via Port 1. Port 1 is a 15-pin port that supports RS-232 and RS-422/485.

Port 2

Connect your RS-485 network via Port 2. Port 2 is provided with a 3-wire removable terminal block.

Compatible Touch Screen Monitors

The ***C-more*** EA9-RHMI supports both ELO Resistive and SAW touch screens and EETI eGalax Resistive touch screens starting with firmware version 6.53. EETI eGalax single-touch pCap touch screens are supported with firmware version 6.70.

NOTE: *Check with the monitor manufacturer to make sure the monitor you purchase uses one of the drivers listed below.*

Capactive, single or multi-touch touch screens are not supported

The manufacturers and models that have been tested at the time of firmware version 6.70 release are:

EA9-RHMI Compatible Touch Screen Monitors				
Manufacturer / Distributor	**Models**	**Driver**	**Minimum Firmware Version**	**Support Website**
AutomationDirect	Atlas	ELO	6.53	https://automationdirect.com
Hope Industrial Systems	- xVxx Resistive Touch Screen Models	ELO	6.53	https://www.hopeindustrial.com
ELO	All Resistive and SAW Touch Screen Models	ELO	6.53	https://www.elotouch.com
Advantech	IDS-3215R-40XGA1E Touch Screen Monitor	eGalax - Resistive	6.53	https://www.advantech.com
Tru-Vu	VMTR-15C-24 Touch Screen Monitor	eGalax - Resistive	6.53	https://tru-vumonitors.com
Dynics	FX15PTUMAD Touch Screen	eGalax - Resistive	6.53	https://www.dynics.com
Tru-Vu	ZBMT-18.5-R	eGalax - pCap	6.70	https://tru-vumonitors.com
Advantech	FPM-221W-P4AE	eGalax - pCap	6.70	https://www.advantech.com

Please contact the touch screen monitor supplier to confirm it uses a supported driver.

Handling External Memory Devices

Writing to External Memory Devices

Different types of numeric and text data from the ***C-more*** HMI can be stored on an SD card or a USB memory device. Numeric data from Line Trend Graph and PID Faceplate Trend Graph objects may be stored. Text data from Lookup Text and Multi-state Text objects can also be stored.

Up to 16 objects may be configured in the ***C-more*** programming software to log data. Along with the 16 object limit, available storage on the external memory device is subject to the memory capacity of the SD card or USB memory device. One log file is created in a 24 hour period for each object. Additionally, logging data is initially stored in the buffer in the panel MRAM and data is written to the external memory device when one of the following occurs:

- When 2kB of data is cached
- When 20 records have been stored
- Periodically, once every 1 minute
- When one of the "SYS Copy LogTo %device%" or "SYS %device% Eject" tags is turned on
- When there is an email or FTP action
- When the System Screen is called
- When the panel date is changed

Memory Device Formatting

Memory Devices should be formatted according to the following guidelines to ensure best performance and integrity of logged data.

Item		Capacity	Supported Resolution	Supported
USB Memory Device		up to 2GB	FAT	Yes
		4GB to 32GB	FAT 32	Yes
		64GB or larger	exFAT	Yes
SD Card	Type			
	SD	up to 2GB	FAT	Yes
	SDHC	4GB to 32GB	FAT 32	Yes
	SDXC		exFAT	No

SD cards must be formatted using the SD formatter provided by the SD Association at www.sdcard.org using the standard allocation unit size for best performance.

Minimizing Data Errors

To minimize data errors when logging data to external memory, consider the following:

- Do not turn off power to the ***C-more*** HMI while the external memory device is being accessed.
- Do not remove any external memory device when the device is being accessed by the ***C-more*** panel.

The following internal tags should be used to monitor, access and safely remove external memory devices:

SYS SD1 WriteStatus
SYS USB WriteStatus
SYS Copy LogToSD1
SYS Copy LogToUSB
SYS SD1 Eject
SYS USB Eject
SYS SD1 ReadyToUse
SYS USB ReadyToUse

- Be sure to back up the memory device at regular intervals.
- If you suspect the memory device is bad, you may want to use a PC to re-format the device, or use a known good memory device.
- The number of times the memory device can be written to is limited. Consequently, logging frequently will shorten the service life of the memory device. Using slower sample rates will increase the life of the device.

Monitoring Available Memory

Each external memory device can be monitored and events can be configured to alert the user when available memory is approaching the maximum capacity of the external memory device. The following internal tags allow external memory devices data to be monitored:

SYS SD1 TotalMemory
SYS SD1 FreeMemory
SYS SD1 UsedMemory
SYS USB TotalMemory
SYS USB FreeMemory
SYS USB UsedMemory

Refer to the ***C-more*** programming software online help files for additional information on system tags and managing data logging devices.

File Name Limitations

There is a limit of 999 file names with the same first four characters. Internal file names are restricted by the DOS 8-character-dot-3-character limit. Therefore trend log files are identified internally by the first four characters of the object name plus tilde plus a three digit number.

Examples are:

TREND GRAPH EAST CHILLER TEMP_130925.txt is saved internally as TREN~001.txt
TREND GRAPH WEST CHILLER TEMP_130925.txt is saved internally as TREN~002.txt

As new log files are created in each 24 hour period, these files count against the maximum of 999 files. If multiple graph objects appear on one screen, the files will be identified internally by the first two characters of the screen name plus the first two characters of the object name plus tilde plus three digit number.

To maximize storage capabilities on external memory devices, use screen names that have unique characters in the first four digits and object names that are unique in the first two characters.

NOTE: *When the 999 filename limit is reached, the oldest files will automatically be deleted and logging will continue.*

Power Loss Retention

When a power loss is detected, the panel will attempt to complete all data logging operations safely.

The power retention while using a DC power supply is not long enough to complete writes to an SD Card or USB device. An Uninterruptable Power Supply (UPS) should be considered.

Power Loss Detection (at 25°C)	
Power Supply	Detect Loss
DC (Panel only)	8.9 VDC

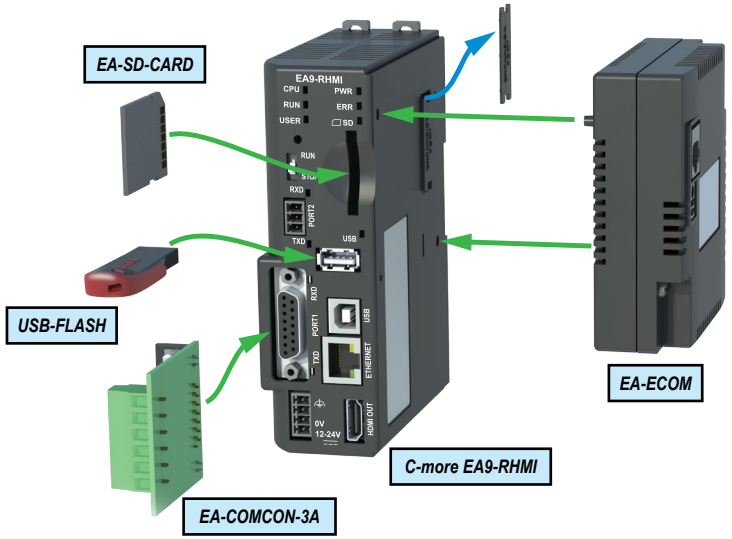
Chapter 3
Accessories

In This Chapter...

Accessories Overview 3-2
EA-ECOM Ethernet Communication Module 3-3
D-SUB 15-pin to Terminal Block Adapter 3-4
SD Card 3-5
USB FLASH Drive 3-5

3

Accessories Overview



Part Number	Description
EA-ECOM	Ethernet communication expansion module, (1) RJ45 10/100 Mbps Ethernet port.
EA-SD-CARD	SD memory card for non-volatile storage, 2GB industrial grade. 85°C maximum operating temperature makes it suitable for data logging in industrial applications.
USB-FLASH	USB Flash drive, SanDisk, 32GB
EA-COMCON-3A	DSUB port adapter, 15-pin male to 6-pole RS-422/485 terminal block, straight cable entry

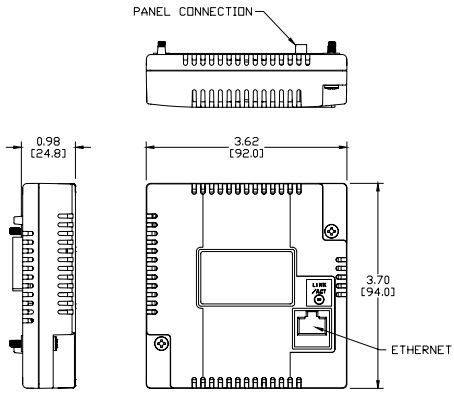
EA-ECOM Ethernet Communication Module

The EA-ECOM Ethernet Communication module plugs into the expansion port on the ***C-more*** EA9-RHMI to allow a second Ethernet communication port for programming and PLC communications at a speed of 10/100 Mbps.

EA-ECOM

Dimensions: Inches [mm]

Link Status LED (Green)	
On	Ethernet Linked
Off	No Ethernet Comm.
Blinking Green	Comm. Activity



EA-ECOM Specifications	
Part Number	EA-ECOM
Operating Temperature	0 to 50°C (32 to 122°F) Maximum surrounding air temperature rating: 50°C
Storage Temperature	–20 to +60°C (–4 to +140°F)
Humidity	5–95% RH (non-condensing)
Environmental Air	For use in pollution degree 2 environment
Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0 G, sweeping, at a rate of 1 octave/min. (±10%), 10 sweep cycles per axis on each of 3 mutually perpendicular axes
Shock	IEC60068-2-27 (Test Ea), 15G peak, 11ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
Noise Immunity	NEMA ICS3-304 RFI, (145MHz, 440MHz 10W @ 10cm) Impulse 1000V @ 1µs pulse
Emission	EN55011 Class A (Radiated RF emission)
Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page
Mounting Torque	50 oz·in [0.35 N·m]
Weight	0.23 lb [105g]
Ethernet Specification	Conforms to IEEE802.3
Communication Speed	10/100 Base-T (Automatic Negotiation)
Cable Specification	Category 5
Auto MDI / MDI-X	Yes
Connector Type	RJ45

D-SUB 15-pin to Terminal Block Adapter

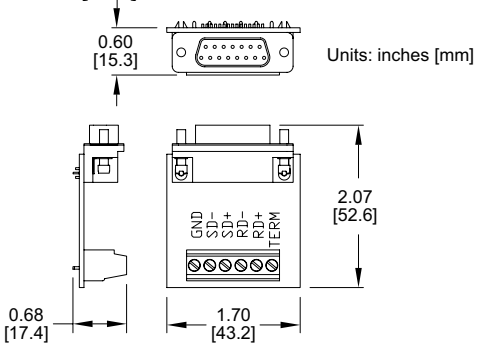
The EA-COMCON-3A adapter is plugged into the 15-pin serial port on the front of the EA9-RHMI to allow wire terminal connections for RS-422/485 PLC communication cables.

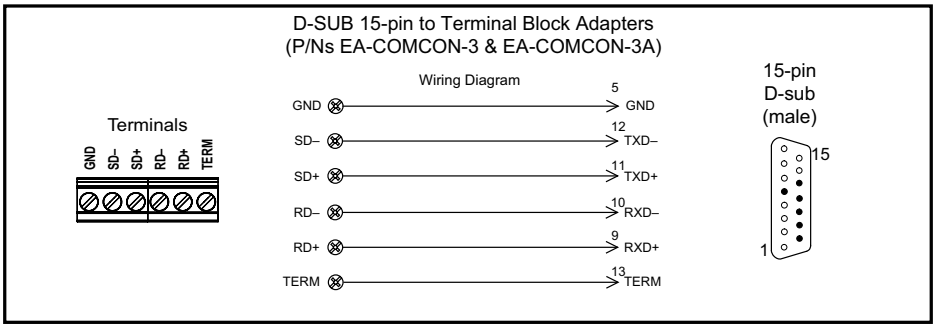
EA-COMCON-3A is NOT UL Recognized or Listed.

EA-COMCON-3A

Dimensions

inches [mm]





SD Card

SD memory card for non-volatile storage, 2GB industrial grade. 85° C maximum operating temperature makes it suitable for data logging in industrial applications. Recommended for ***C-more*** EA9 series. The EA-SD-CARD utilizes SLC technology so it is the fastest option for writing and storing data. If logged data is saved to external memory, AutomationDirect recommends using an EA-SD-CARD.

EA-SD-CARD

NOTE: *SLC Flash memory utilized by EA-SD-CARD has the advantage of being the most accurate flash memory type when reading and writing data. SLC flash has the longest lifespan of flash types and can operate in a broader temperature range than other types.*

EA-SD-CARD with SLC Flash memory is recommended for industrial workloads that require heavy read/write cycles.

USB FLASH Drive

USB-FLASH sold by AutomationDirect has been tested with ***C-more*** HMIs and is Hi-Speed USB 2.0 certified. The EA-SD-CARD is the best option for logging data, but the USB-FLASH is a high quality flash drive perfect for transferring log files, capturing screens, backing up and restoring projects and storing images for the Image Viewer object.

USB-FLASH

Installation and Wiring

In This Chapter...

Safety Guidelines **4-2**

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Mounting **4-4**

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Panel Mounting 4-4

Mounting Clearances 4-5

Wiring Guidelines **4-6**

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Providing Power to the HMI 4-7

C-more LED Status Indicators 4-8

Reset Button 4-9

RUN/STOP switch 4-9

Safety Guidelines

NOTE: Products with CE marks *perform their required functions safely and adhere to relevant standards as specified by CE directives provided they are used according to their intended purpose and that the instructions in this manual are adhered to. The protection provided by the equipment may be impaired if this equipment is used in a manner not specified in this manual. A listing of our international affiliates is available on our website: http://www.automationdirect.com*

WARNING: Providing a safe operating environment for personnel and equipment is your responsibility and should be your primary goal during system planning and installation. Automation systems can fail and may result in situations that can cause serious injury to personnel or damage to equipment. Do not rely on the automation system alone to provide a safe operating environment. You should use external electromechanical devices, such as relays or limit switches, that are independent of the PLC application to provide protection for any part of the system that may cause personal injury or damage. Every automation application is different, so there may be special requirements for your particular application. Make sure you follow all national, state, and local government requirements for the proper installation and use of your equipment.

Plan for Safety

The best way to provide a safe operating environment is to make personnel and equipment safety part of the planning process. You should examine every aspect of the system to determine which areas are critical to operator or machine safety. If you are not familiar with control system installation practices, or your company does not have established installation guidelines, you should obtain additional information from the following sources.

- NEMA — The National Electrical Manufacturers Association, located in Washington, D.C. publishes many different documents that discuss standards for industrial control systems. You can order these publications directly from NEMA. Some of these include:

  ICS 1, General Standards for Industrial Control and Systems

  ICS 3, Industrial Systems

  ICS 6, Enclosures for Industrial Control Systems

- NEC — The National Electrical Code provides regulations concerning the installation and use of various types of electrical equipment. Copies of the NEC Handbook can often be obtained from your local electrical equipment distributor or your local library.
- Local and State Agencies — many local governments and state governments have additional requirements above and beyond those described in the NEC Handbook. Check with your local Electrical Inspector or Fire Marshall office for information.

Introduction

The installation and wiring of the ***C-more***® EA9-RHMI requires selecting an appropriate location for the HMI in the control cabinet that it will be mounted in, securing the unit to the DIN Rail or mounting it to the back panel of the enclosure with screws, and connecting the appropriate power source to the HMI.

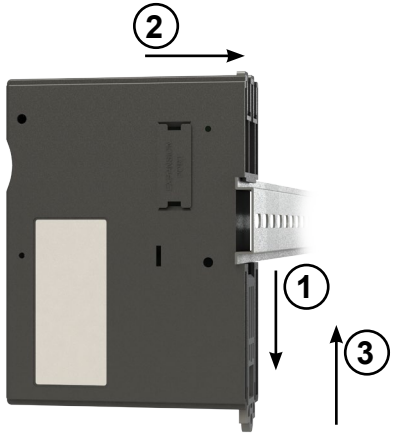
This chapter covers the proper mounting of the EA9-RHMI and connecting power. Once power is applied to the unit, the user will want to read Chapter 5, System Setup Screens, in order to set the internal time and date for the unit, become familiar with the HMI test features, and check memory options.

Mounting

DIN Rail Mounting

EA9-RHMI can be mounted vertically on a standard 35mm x 7.5mm height DIN rail (Standard: CENELEC EN50022).

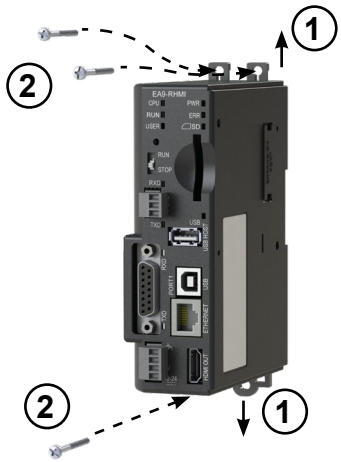
1. Pull the bottom retaining tab of the EA9-RHMI down.
2. Position the EA9-RHMI on the DIN rail.
3. Push the retaining tab up until it clicks to secure the EA9-RHMI on the DIN rail.



Panel Mounting

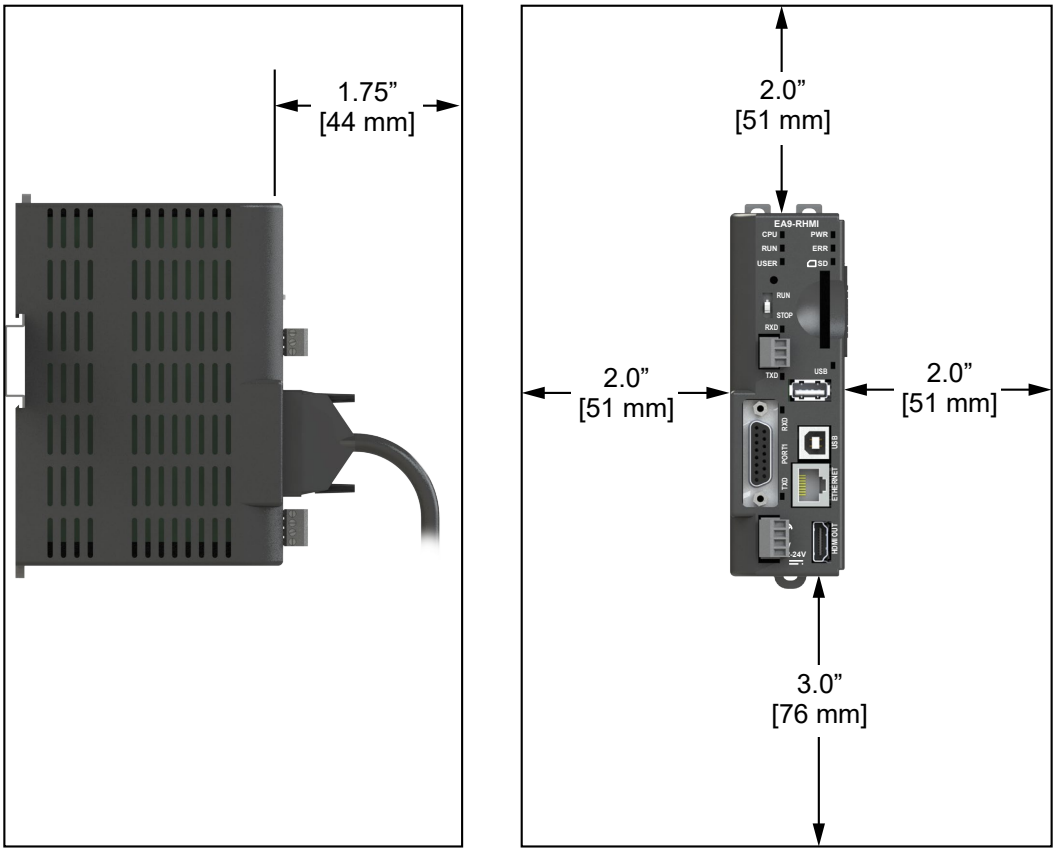
EA9-RHMI can be mounted vertically on a panel using the tabs located on the back of the unit.

1. Fully extend the three mounting tabs located on the top and bottom of the unit.
2. Secure to a panel using three #8 standard or M4 metric screws and appropriate hardware.



Mounting Clearances

The following drawing shows the mounting clearances for the ***C-more*** RHMI. There should be a minimum of 2 inches of space on top and sides and 3 inches on the bottom from the nearest object or obstruction. There should also be a minimum of 1.75 inches of space in front of the unit to allow for the bend radius of any cables attached.



Wiring Guidelines

WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes. Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call technical support at 1-800-633-0405 or 770-844-4200.

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Agency Approvals

Some applications require agency approvals for particular components. ***C-more*** agency approvals are listed below:

- UL (Underwriters' Laboratories, Inc.)
- cUL (Canadian Underwriters' Laboratories, Inc.)
- CE (European Economic Union)

Wiring Guidelines (cont'd)

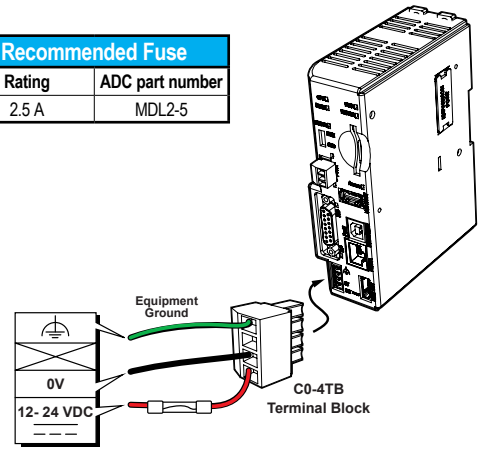
Providing Power to the HMI

- **Connect** a **dedicated** 12-24 VDC Class 2 power supply to the DC connector on the front of the ***C-more*** EA9-RHMI, include wiring the ground terminal to a proper equipment ground
- **Then** turn on the power **source** and check the LED status indicators on the front of the ***C-more*** EA9-RHMI for proper indication (see next page)

NOTE: *A dedicated power supply is recommended. If the power supply also feeds inductive loads such as solenoids or relays, the transients caused by these loads can affect the operation of the unit or damage HMI components.*

DC Power Wiring

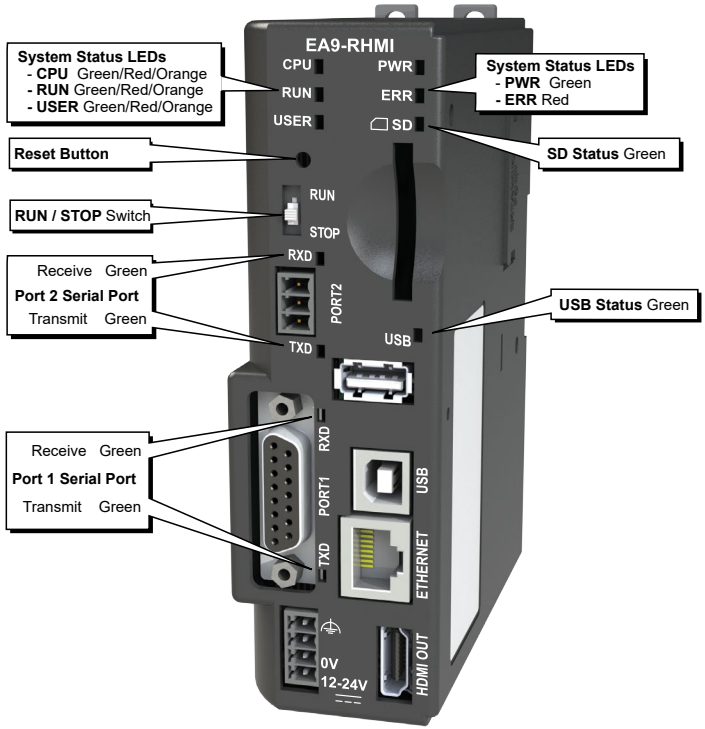
Recommended Fuse	
Rating	ADC part number
2.5 A	MDL2-5



Tightening Torque	
Power supply cable torque	32-35 oz-in (0.22-0.25 Nm)

Warning: Use 60/75°C copper conductors only.

C-more LED Status Indicators



System Status LEDs				
	LED / State	CPU	RUN	ERR
Status	Loading OS	Blinking Green (0.5s)	OFF	OFF
	CPU Running Normal	Green	–	OFF
	Project Loaded and Running	–	Green	–
	No User Project	–	Orange	–
	Password Required	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Errors	Power Loss Detection	Blinking Orange (0.2s)	–	–
	Memory Error	Red	OFF	Red
	OS Error	Blinking Orange (0.5s)	OFF	Red
	Watch Dog Time Out	Blinking Red (0.5s)	–	Red
	No Log Storage Found	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
	General Error*	–	Red (0.5s)	Blinking Red (0.5s)
	Warning*	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Mode	Recovery Mode	Blinking Orange (0.5s)	OFF	OFF
	Safe Mode	Orange	OFF	Red

Note - See Chapter 8 - Troubleshooting for General Error and Warning explanations.

Reset Button

Reset Button		
Push Action	***Behavior***	***Note***
Push for <15 seconds	Reboot the EA9-RHMI	
Push for >15 seconds	Reset to factory default	The project is cleared and all settings are initialized.
Hold down the button and power on the EA9-RHMI	System recovery mode	Recovery tool installed with software and a USB connection is required to recover the panel. The Error LED will be RED and the CPU LED will blink ORANGE. See "No System Found" in Chapter 8 - Troubleshooting

RUN/STOP switch

RUN / STOP Switch		
Position	***Behavior***	***Note***
RUN	Project will run if present and the RUN LED will be green	If no project is loaded in the HMI, the message "No Program Found" will be displayed. The RUN LED will blink orange.
STOP	The project and any logging stops and the System Screen is displayed.	If a password has been set up for the System Screen, the RUN LED will blink orange.
Power on the EA9-RHMI while in the STOP position	After the project is loaded into memory the System Screen is displayed	A System Screen password is ignored.

User Defined LED

The user defined LED on the EA9-RHMI can be controlled from the project to illuminate red, green or orange. It can also be configured to blink these colors. Refer to the online help file provided with the programming software for details.

EA9-RHMI Beep

Beep Functions	
Function	***Beep Pattern***
Boot	1-long, 2-short
Boot Error*	3-long
HDMI Connected	3-short
Reset to Factory Defaults	14 short beeps progressively closer together followed by 1-long beep.
Blink Screen	5-long

Boot Errors

Multiple Projects
Write Protected SD Card
No Log Storage Found
System Screen (RUN/STOP switch in STOP position)
Password Protected

System Setup Screens

In This Chapter...

Introduction **5-2**

Accessing the System Setup Screens **5-3**

With no project loaded 5-3

With project loaded 5-4

Using RHMI USB Remote 5-5

System Setup Screens – Enable Password in Software **5-7**

System Setup Screens Flowchart **5-13**

Main Menu **5-14**

Information Menu **5-15**

Setting Menu **5-19**

Test Menu **5-25**

Memory Menu **5-35**

Introduction

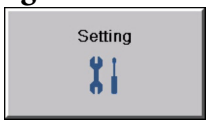
The ***C-more*** EA9-RHMI includes a series of built-in System Setup Screens that allow the user to view detailed information about the HMI; adjust certain features; configure communications; test various functions of the HMI; backup and restore firmware, recipe, log and project memory; clear memory and reset all values and conditions back to the original factory defaults.

The four Main Menu selections are:

Information

The information tabs display details about the HMI model; the HMI's name; version information for the hardware, boot loader and firmware; clock source, and beeper status. Other tabs display details on the HMI's internal memory and the status of any external memory devices. Communication port details are available in this area, as well as an error log to help in troubleshooting the system

Setting

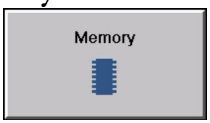


This is the area for (1) making adjustments to the internal clock, (2) setting the IP addresses (3) adjusting (calibrating) a connected touch screen, (4) enabling or disabling the internal beep, and (5) enabling or disabling a mouse pointer.

Test Menu

From this sub menu, the user can (1) test the a connected touch screen, (2) test a connected display, (3) test the user LED (4) test the communication ports, and (5) test both the internal beeper. A WAV sound file is system provided for the audio output test.

Memory



Select the Memory menu item to either backup or restore your project, log data, recipe data and/or system memory. Selections can be made to backup to optional SD card memory or USB pen drive memory. The menu selections also give the user the ability to clear the memory, and there is also a selection to reset all of the HMI settings back to the original factory defaults.

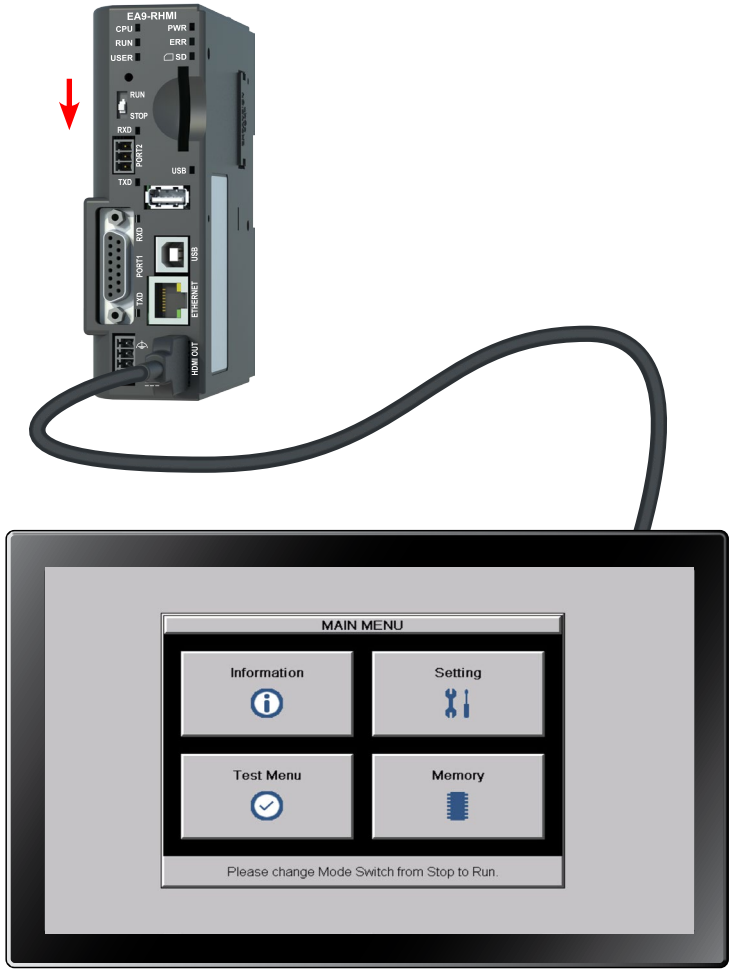
Accessing the System Setup Screens

There are three ways to access the System Setup Screens in the EA9-RHMI.

1) On the HMI by moving the RUN/STOP switch to the STOP position
2) From a connected compatible touch screen using the Key Button Object
3) From the ***C-more*** Software and using the RHMI USB Remote utility

With no project loaded

To access the Main Menu of the HMI System Setup Screens prior to downloading a project, move the RUN/STOP switch to the STOP position as shown below. If a display is attached to the EA9-RHMI, the Main Menu will be displayed.



With project loaded

To access the Main Menu of the EA9-RHMI System Setup Screens with a project loaded into memory, move the RUN/STOP switch to the STOP position.

If the RUN/STOP Switch is not accessible, a Key Button Object can be added to a screen in the ***C-more*** HMI project to access the System Screens. See the ***C-more*** Programming Software Help File Topic, "Key Button Object" for more information.

If the Key Button is used and no system screen password is enabled, the following WARNING dialog box will appear on the connected screen:

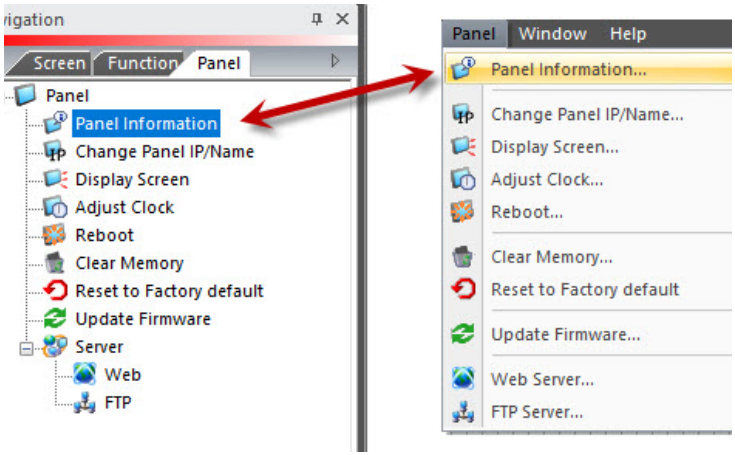
- Pressing OK will display the system setup screen. See the WARNING below!
- Pressing Cancel will take you back to the project screen.
- Communication with the PLC is active while the Warning is displayed.
- The dialog box will close if no action is taken for 60 seconds.
- The dialog box will not display if the HMI does not have a project loaded.
- The dialog box will display after a valid password is entered if the System Screen password is enabled.

WARNING: This will STOP the PLC driver and therefore all communications between the EA9-RHMI and PLC will cease. In addition, moving the RUN / STOP switch to the STOP position does not display this warning. This is why it is strongly recommended that the password system tag "SYS SYSTEMSCREENPW" be enabled to add a safeguard step in accessing the system setup screens. See the next section for an overview of how to set the System Tags in the Event Manager Database.

Using RHMI USB Remote

Another option for seeing the System Screens is through a PC connected by USB to the EA9-RHMI.

In the ***C-more*** programming software, double click Panel Information in the Panel tab on the navigation window as shown below or select Panel Information in the Panel menu.



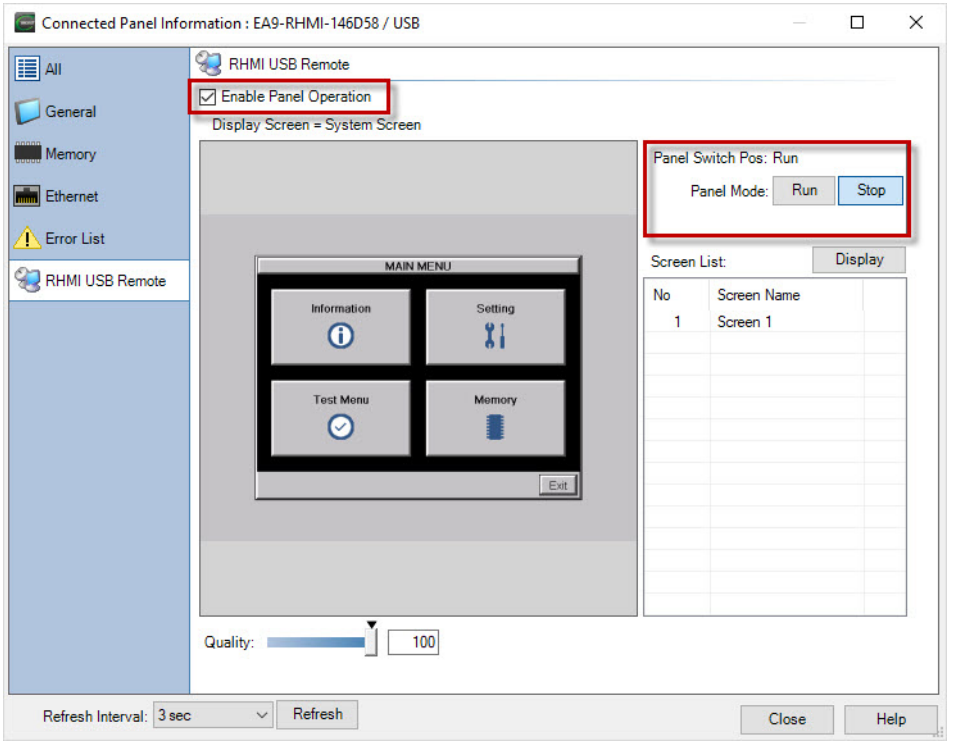
Select RHMI USB Remote. The RHMI USB Remote displays the same screen that is shown on a connected HMI monitor.

NOTE: *The RHMI USB Remote selection is only available if the panel is connected to the PC by a USB cable.*

Select Enable Panel Operation. This allows the screens to be clicked with a mouse and operated as if you were touching a touch screen connected to the HMI.

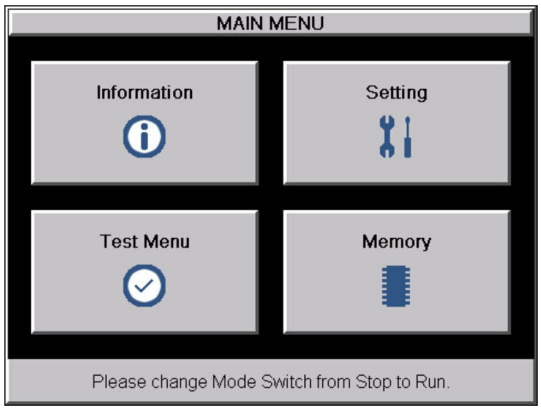
If the HMI's RUN/STOP Switch is in the RUN position, you can select STOP under Panel Switch Position to see the System Screen. If the Switch is in the STOP position already, the System Screen will already be displayed.

For more information see the Help File topic **Panel Tab - Panel Information**.



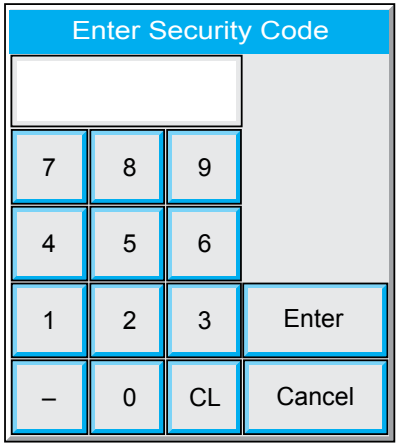
System Setup Screens

Clicking the OK button will open the Main Menu as shown below. You can then proceed to the other system setup screens.



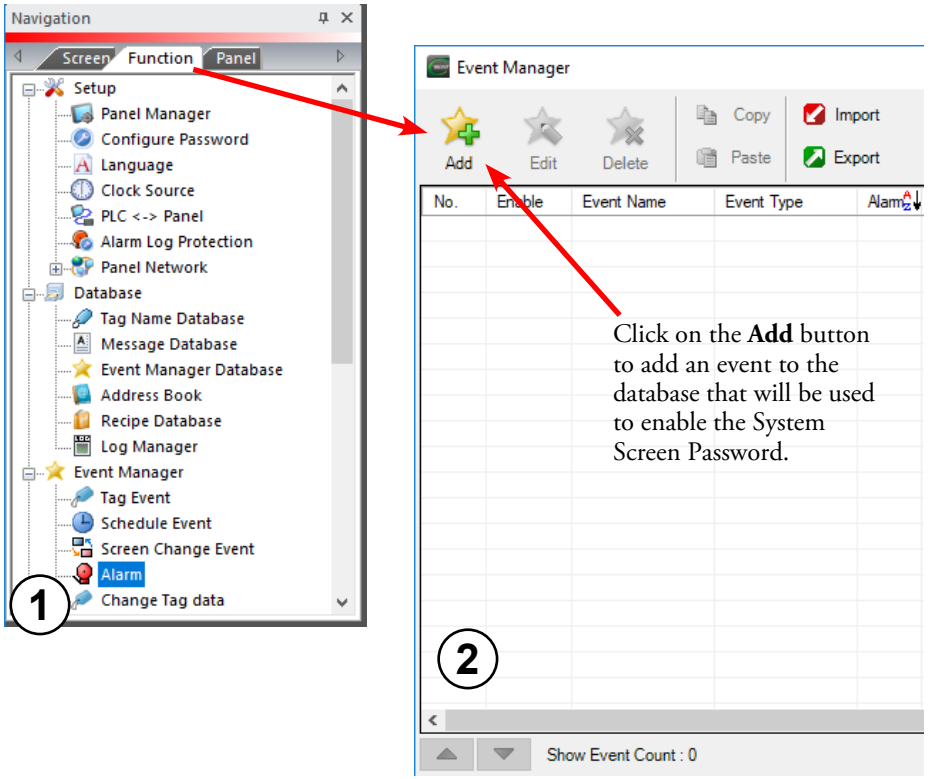
Password Protecting System Screen Access

NOTE: *If the password system tag* ***SYS SYSTEMSCREENPW*** *is enabled, the Enter Security Code keypad shown below will open. The procedure to enable the* ***SYS SYSTEMSCREENPW*** *is detailed below.*
Entering the correct password will display the HMI Run Mode warning dialog described previously. PLC communications continue while the keypad is displayed. The keypad will timeout after 60 seconds.



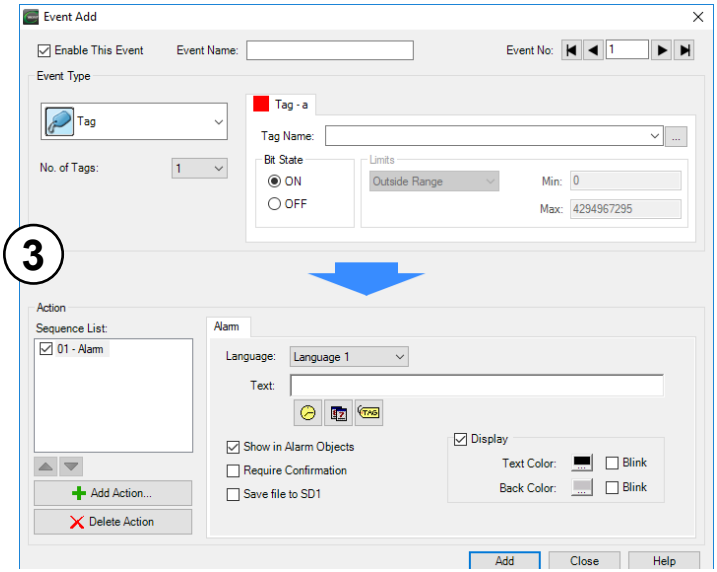
System Setup Screens – Enable Password in Software

Under the ***C-more*** Programming Software's Navigation window, select the Function tab, then double click on "Alarm Action" to display the Event Manager Database shown below:

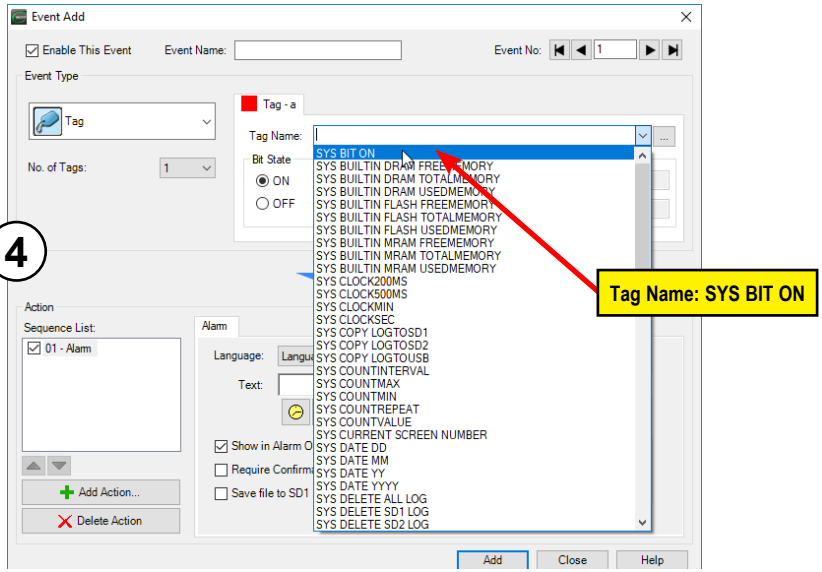


System Setup Screens – Enable Password (cont'd)

The **Event Add** dialog box will be displayed as shown.



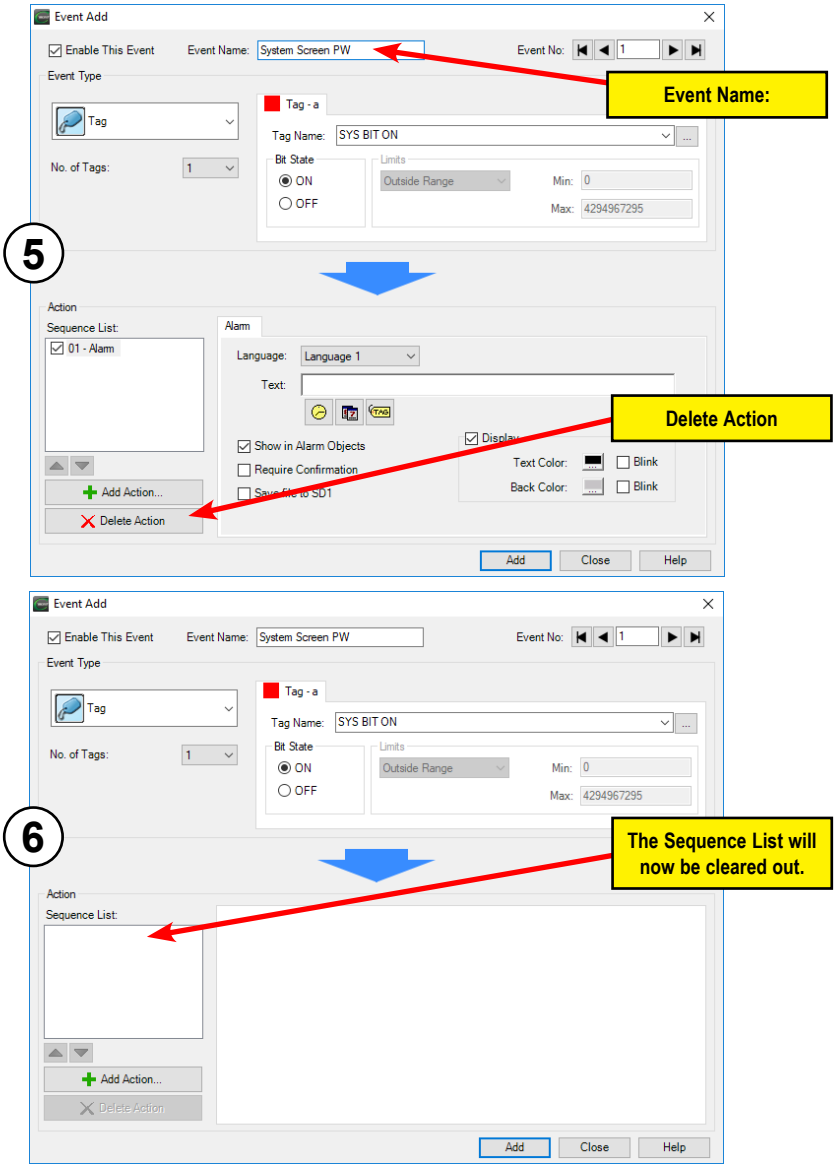
Click on the **Tag Name:** pull down menu and select the internal **System Bit On (SYS BIT ON)** tag as shown. This will force the tag event type to be continuously active.



System Setup Screens – Enable Password (cont'd)

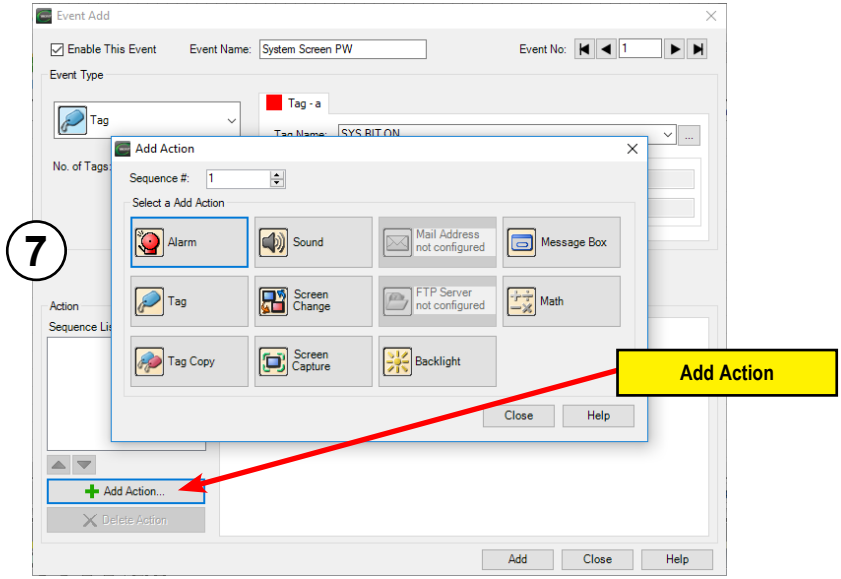
Use the Event Name: text box to document the event as "System Screen PW" for record keeping This is optional.

In the Action box, click once on the displayed 01-Alarm under the Sequence List: so that 01-Alarm is highlighted. Then click the **Delete Action** button to remove the **01-Alarm**.

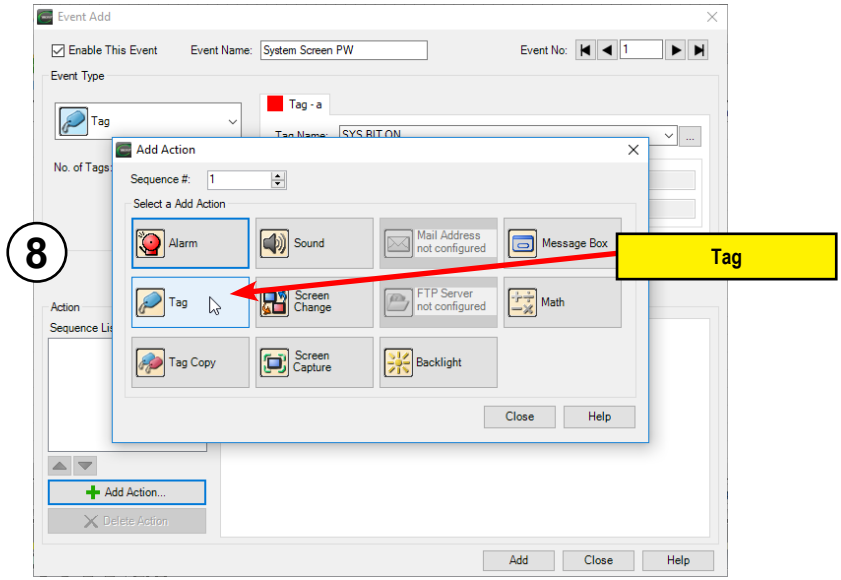


System Setup Screens – Enable Password (cont'd)

In the **Action** box, click on the **Add Action...** button. This will bring up the **Add Action** dialog box as shown below:

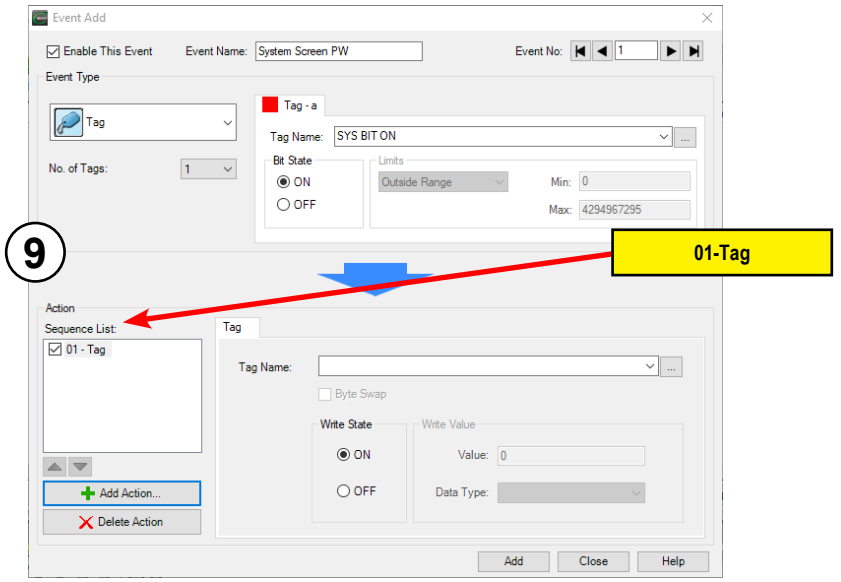


Click on the **Tag** button.

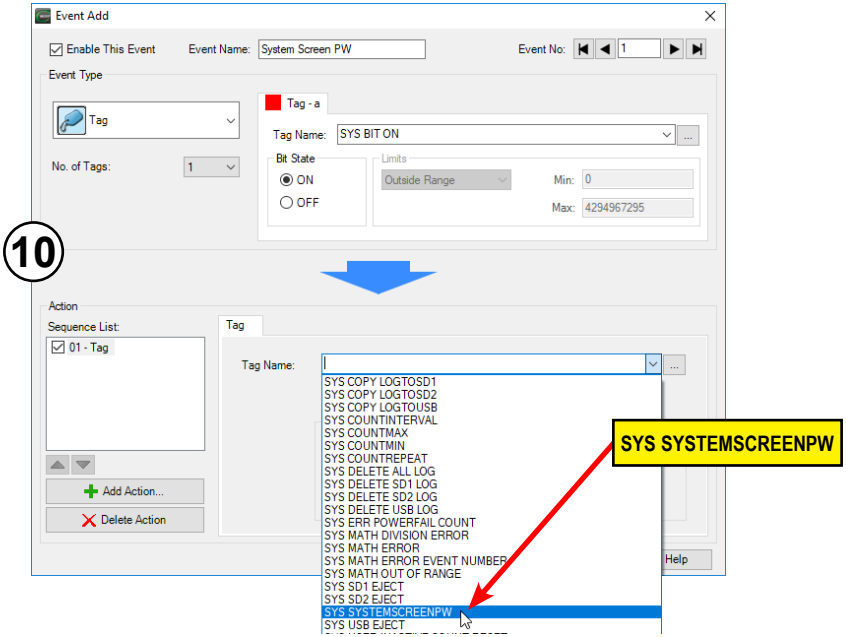


System Setup Screens – Enable Password (cont'd)

A **01-Tag** action item will then be added to the **Sequence List**.

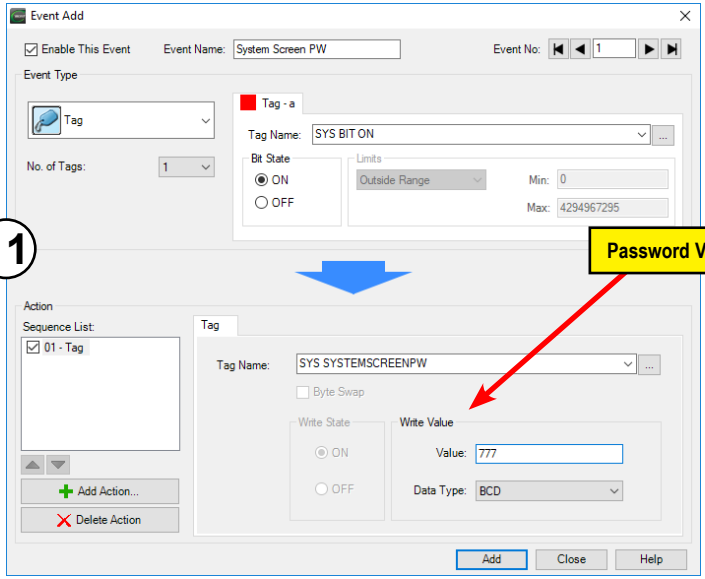


Click on the **Tag Name:** pull down list down arrow in the **Action** box's **Tag** tab, select **SYS SYSTEMSCREENPW** from the list, and click **OK**.

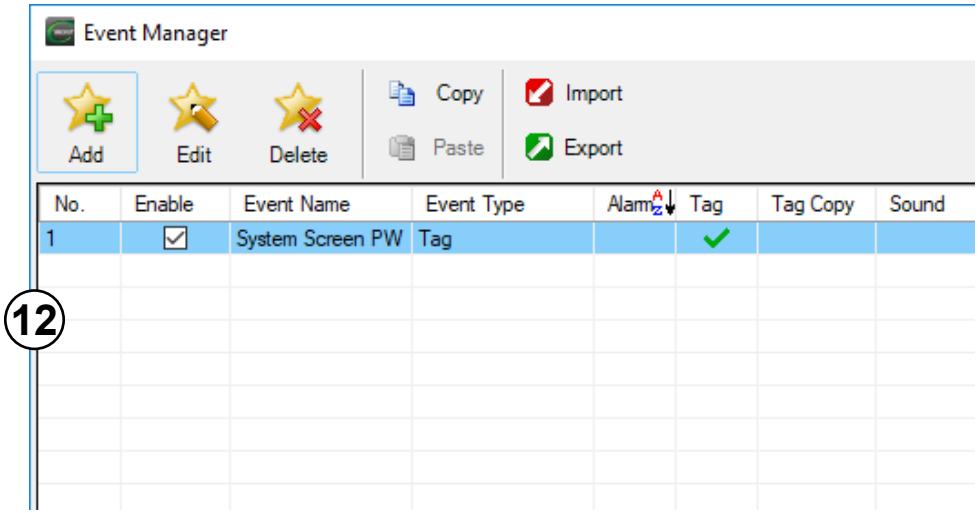


System Setup Screens – Enable Password (cont'd)

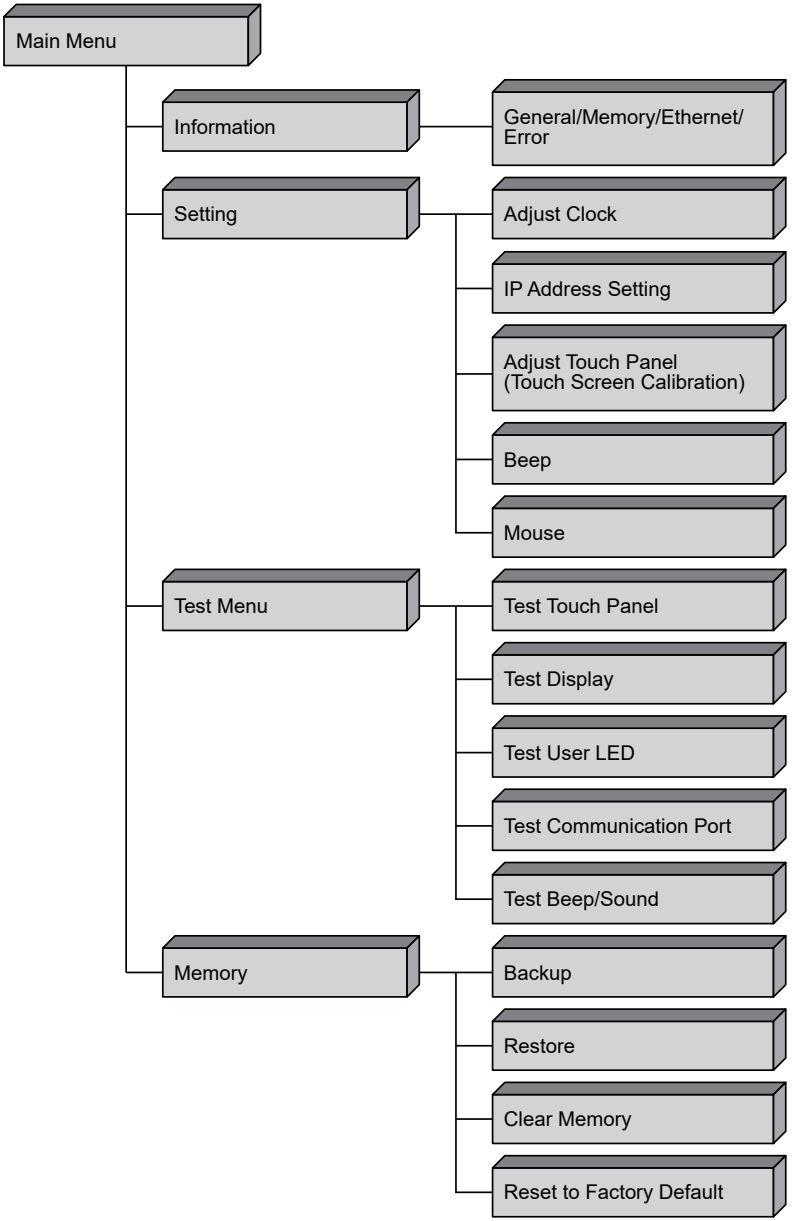
Enter a numeric value into the **Value:** box, such as "777". This value becomes the Password code to access the System Setup Screen's **Main Menu**.



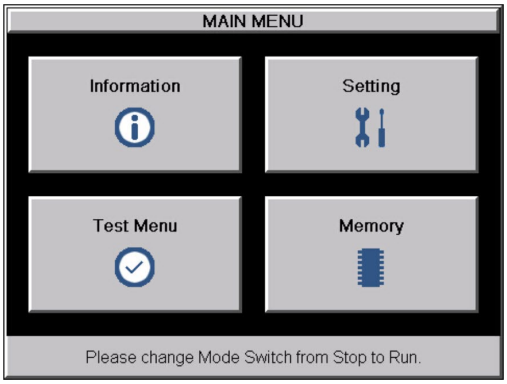
Click the **Add** button in the Event Add dialog box and then the **Close** button to return to the Event Manager Database. You now will see that the first event in the database is for the System Screen Password and it is enabled.



System Setup Screens Flowchart



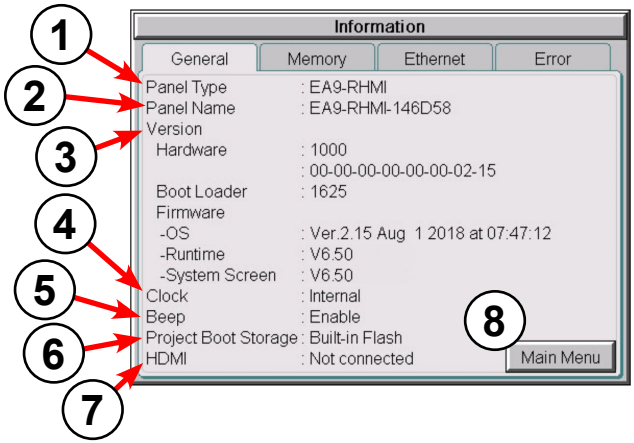
Main Menu



The **Main Menu** system setup screen is the top layer in the menu structure.

Information Menu

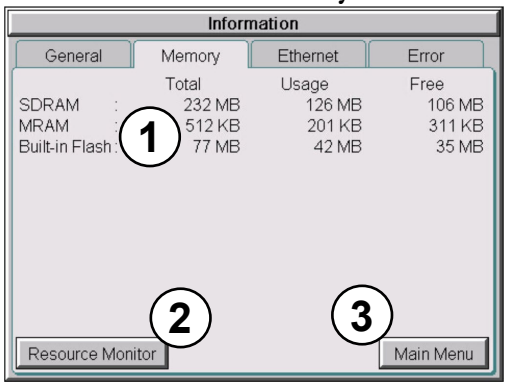
Information - General tab



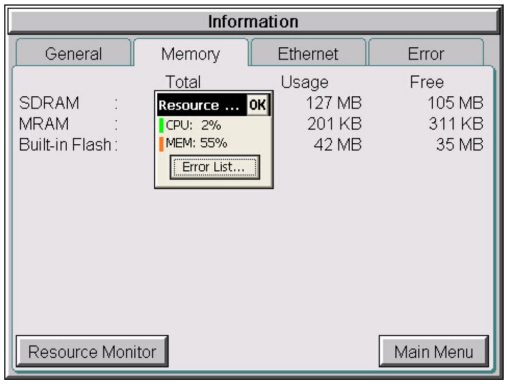
The **General** tab under the Information menu provides detailed information about the ***C-more*** HMI.

Item No.	Function	Description	Comments
1	**Panel Type**	EA9-T6CL-R EA9-T6CL EA9-T7CL-R EA9-T7CL EA9-T8CL EA9-T10CL EA9-T10WCL EA9-T12CL EA9-T15CL-R EA9-T15CL EA9-RHMI	Model Number
2	**Panel Name**	The panel name is configured in the programming software and saved with a project.	The default panel name is the model number plus the lower three bytes of the panel MAC address, i.e. EA9-T8CL-0022C4.
3	**Version**	The version identifications provide information on the components and firmware in the panel	Files reside in the ***C-more*** HMI's memory.
4	**Clock**	Internal/External clock selection.	Configured in the ***C-more*** Programming Software.
5	**Beep**	Status of the internal beeper.	Configurable in the Setting Menu – Beeper shown on page 5-23 or in the ***C-more*** Programming Software.
6	**Project Boot Storage**	The location of the current project.	Built-in flash, SD1
7	**HDMI**	HDMI connection to an external screen. Only models with HDMI port	Connected, Not connected
8	**Main Menu**	Press to return to the **Main Menu** screen.	**Main Menu** shown on previous page.

Information - Memory tab

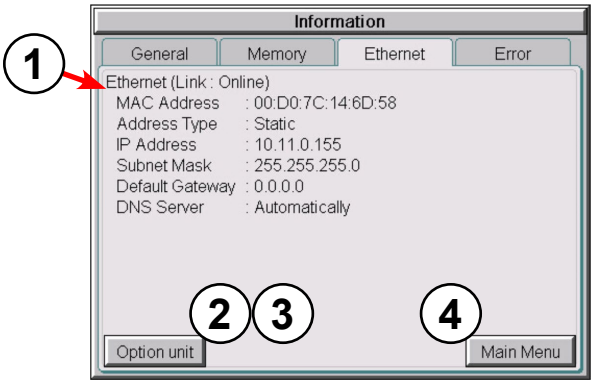


1. **Memory components** - Status of each memory component - SDRAM, MRAM and Built-in Flash are internal memory components. When external memory devices are installed in the panel they will be included in this list : SD and USB.



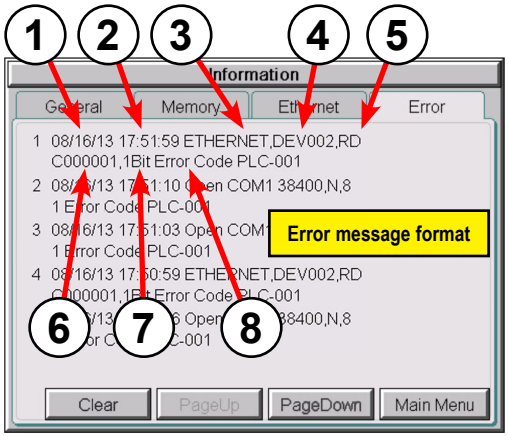
2. **Resource Monitor** - Selecting Resource Monitor displays the CPU and runtime memory usage percentage. This window will remain open after exiting from the system screen. This allows for monitoring the panel resources while the project is running. Pressing the Error List button expands the window to show the PLC communication error list in real time. Press OK once to remove the Error List. Press OK again to close the Resource Monitor window.
3. **Main Menu** - Press to return to the Main Menu screen - Main Menu shown previously

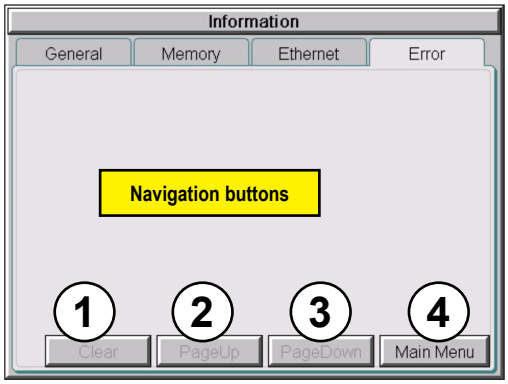
Information - Ethernet tab



Item No.	Function	Description	Comment
1	**Ethernet (Link: Online)**	Ethernet Settings: MAC Address: 00 D0 7C XX XX XX Address Type: DHCP/Static IP Address: Subnet Mask: Default Gateway: DNS: 1) Automatically 2) Use Designated Address	Configurable in the **Setting Menu – IP Address Setting** shown in this section or in the ***C-more*** Programming Software.
2	**Option Unit**	Opens Ethernet settings for optional EA-ECOM if connected.	
3	**Option (Link Online)**	Ethernet Settings: MAC Address: 00 D0 7C XX XX XX Address Type: DHCP/Static IP Address: Subnet Mask: Note: Option Unit uses the same Default Gateways as Item 1 - Ethernet	
4	**Main Menu**	Press to return to the **Main Menu** screen.	

Information - Error tab





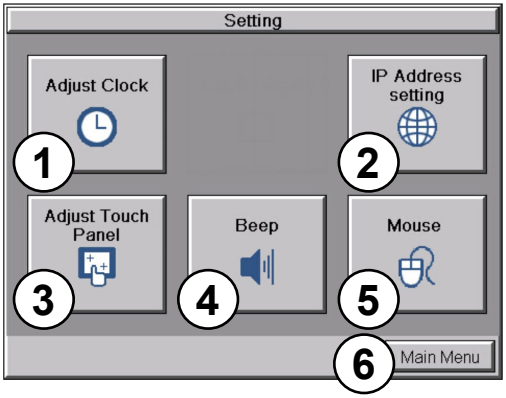
Error Message Format:

Item No.	Function	Description	Comment
Order of error message functions: **Error Number, Date, Time, Error Port, Device Name, Error Type, PLC Address, Access Bytes, Error Message**			
1	**Date**	Format: MM/DD/YY	Date error occurred.
2	**Time**	Format: HH/MM/SS	Time error occurred.
3	**Error Port**	PLC Serial Communications Port: Ethernet:	
4	**Device Name**	The name of the device reporting the error.	Device names are configured in the programming software, Panel Manager
5	**Error Type**	RD: Read WT: Write	
6	**PLC Address**	The assigned address of the PLC that caused the error.	
7	**Access Bytes**	The number of access bytes.	
8	**Error Message**	The error message is the same as the message displayed in the upper left of the ***C-more*** HMI's connected display.	A list of Error Massages is shown in Appendix A

Error Message navigation buttons:

Item No.	Function	Description	Comment
1	**Clear**	Press to clear all error messages. This button is grayed out when there are no error messages to display.	Errors are also cleared with firmware is updated on the panel. Errors are not cleared on power cycle or project transfer.
2	**Page Down**	Press to go to the next page. This button is grayed out when there is no error messages on the next page.	
3	**Page Up**	Press to go to the previous page. This button is grayed out when there is no error messages on the previous page.	
4	**Main Menu**	Press to return to the **Main Menu** screen.	

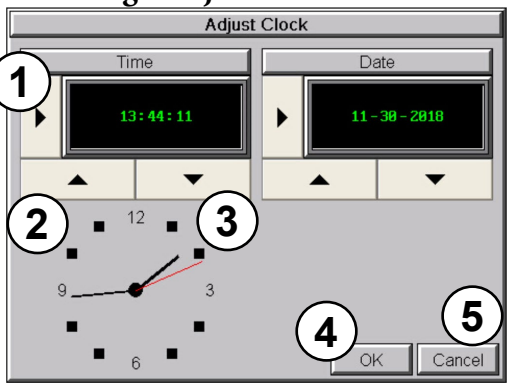
Setting Menu



The **Setting Menu** is used to adjust the time & date, adjust the contrast or brightness of the display, enter the IP address settings, adjust (calibrate) the connected touch screen, enable or disable the internal beep and turn on and off the mouse cursor .

Item No.	Function	Description	Comments
1	**Adjust Clock**	Press to go to the **Adjust Clock** screen.	
2	**IP Address**	Press to go to the **IP Address** screen	The IP Address can also be set from the programming software or by the project.
3	**Adjust Touch Panel**	Press to go to the **Adjust Touch Panel** screen.	
4	**Beep**	Press to go to the **Beep** screen.	
5	**Mouse**	Press to go to the **Mouse** screen.	
6	**Main Menu**	Press to return to the **Main Menu** screen.	

Setting – Adjust Clock



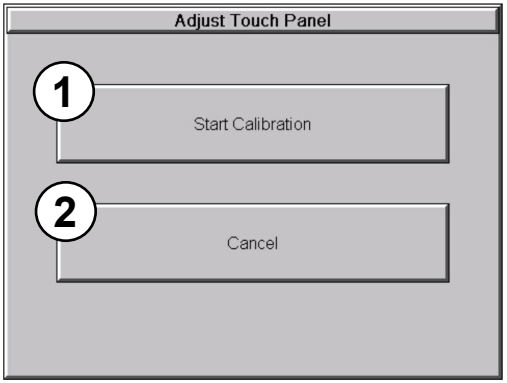
Item No.	Function		Description	Comments
1	Select		**Time:** Each press of the **Select** button will cycle thru the following settings. 1) No Selection to Hours 2) Hours to Minutes 3) Minutes to Seconds 4) Seconds back to Hours **Date:** Each press of the **Select** button will cycle thru the following settings. 1) Month to Day 2) Day to Year 3) Year back to Month	
2	Up		Press to increment the value by "1" with each press.	
3	Down		Press to decrement the value by "1" with each press.	
4	OK		Press to accept the changes.	
5	Cancel		Press to return to the **Setting Menu** screen without accepting the changes.	

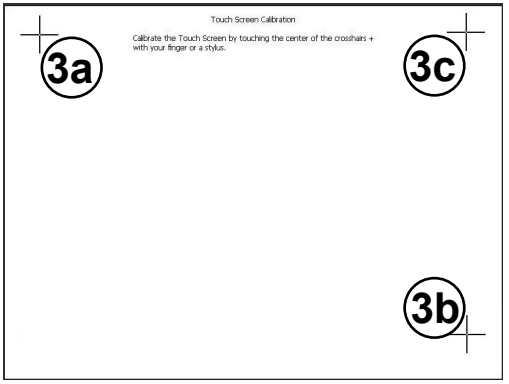
NOTE: *The function buttons used to adjust the clock settings on the panel's setup screen are* ***disabled*** *if an* ***External*** *clock source is selected in the* ***C-more*** *programming software. The choice of an internal or external clock source is available by selecting* ***Clock Source*** *in the* ***C-more*** *programming software under the* ***Main Menu*** *drop down function* ***Setup.***

NOTE: *The panel's clock can also be adjusted from the* ***C-more*** *programming software. The* ***Adjust Clock*** *function can be accessed in the software by selecting* ***Adjust Clock*** *under the* ***Main Menu*** *drop down function* ***Panel*** *or selecting* ***Adjust Clock*** *under the* ***Panel*** *tab in the software's* ***Navigation*** *window.*

Setting – Adjust Touch Panel

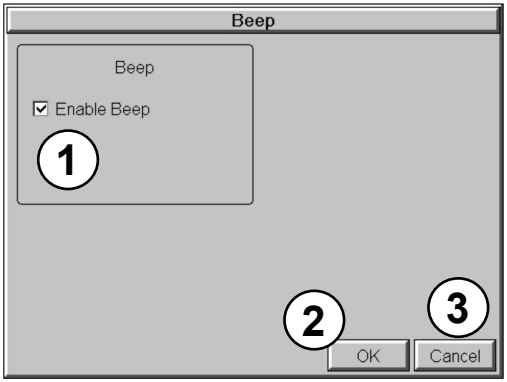
A compatible touch screen can be attached to the EA9-RHMI through the USB Type A port. This procedure is used to calibrate a connected touch screen to ensure accuracy of the touch areas. There are three points on the touch screen that the calibration is based around. The adjustment relies on very narrow areas for the calibration points.





Item No.	Function	Description	Comment
1	**Start Calibration**	Press to begin the touch screen calibration	
2	**Cancel**	Press to return to the **Setting Menu** screen.	
3	**Points 3a thru 3c**	The touch screen calibration crosshairs will appear individually in the order of point 3a thru 3c respectively as each proceeding crosshair is pressed.	Once all three points are touched, select Accept, Redo or Cancel.

Setting – Beep

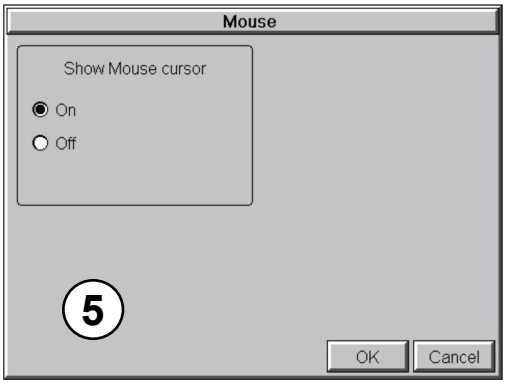


This system setup screen function is used to enable or disable the HMI's internal beep function.

Item No.	Function	Description	Comments
1	**Enable Beep**	Check to enable the internal beep.	
2	**OK**	Press to accept the changes.	
3	**Cancel**	Press to return to the **Setting Menu** screen without accepting the changes.	

NOTE: *The project settings in the* ***C-more*** *programming software* ***Panel Manager*** *will override the HMI's internal setting upon initial download.*

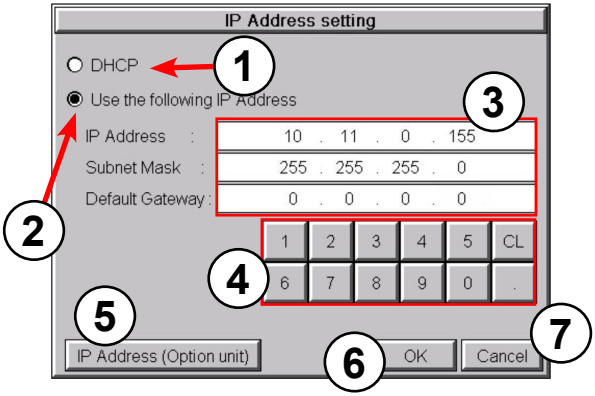
Setting – Mouse



This system setup screen function is used to enable/ disable the arrow mouse cursor on the connected screen. It may be valuable to display the mouse cursor, for example, when an external USB keyboard is connected to the panel. The mouse cursor is enabled by default when the EA9-RHMI panel is the panel used for a project.

NOTE: *The project settings in the* ***C-more*** *programming software* ***Panel Manager*** *will override the HMI's internal setting upon initial download.*

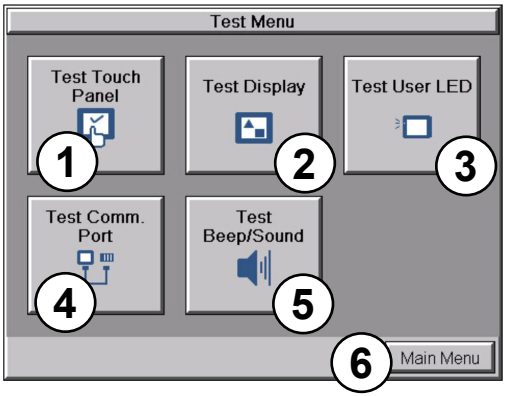
Setting – IP Address Setting



Item No.	Function	Description	Comment
1	**DHCP**	"DHCP" is enabled as the default when this system setup screen is first selected. All of the other selections on this screen are dimmed when "DHCP" is selected and are not available.	
2	**IP Address**	The "Use the following IP Address" setting is selected when its radio button is pressed. Use the numerical keypad to assign the IP address.	Note: If an Ethernet cable is not connected to the HMI from an active Ethernet device, then the IP Address will show as 0.0.0.0.
3	**IP Address** **Subnet Mask** **Default Gateway**	Select the field that needs to be assigned by touching the entry value and use the keypad to enter the desired address.	Each field can be independently assigned.
4	**Keypad**	The keypad is used to enter the Address: Use the numeric keys to enter the address, e.g: 192.168.10.1 **"CL"** = Clear value entered	
5	**IP Address (Option unit)**	Opens Ethernet settings for optional EA-ECOM if connected.	
6	**OK**	Press to accept the changes and return to the **Setting Menu** screen.	
7	**Cancel**	Press to return to the **Setting Menu** screen without accepting the changes.	

*NOTE: The project settings in the **C-more** programming software **Panel Manager** will override the HMI's internal setting upon initial download.*

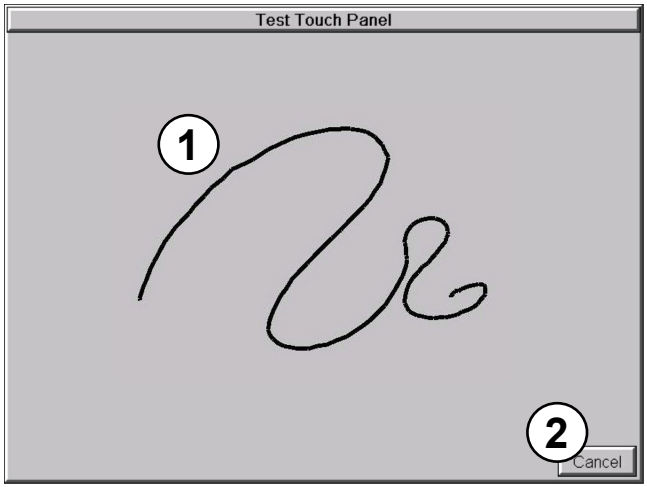
Test Menu



The **Test Menu** gives the user the ability to test the operation of a connected touch screen, test the LCD display, test the various communication ports, and also test the internal beeper.

Item No.	Function	Description	Comments
1	**Test Touch Panel**	Press to go to the **Test Touch Panel** screen.	
2	**Test Display**	Press to go to the **Test Display** screen.	
3	**Test User LED**	Tests the user configurable LED on the front of the panel. Refer to the online help file for details on the configuration of this LED.	
4	**Test Communication Port**	Press to go to the **Test Communication Port** screen.	
5	**Test Beep/Sound**	Press to go to the **Test Beep/Sound** screen.	
6	**Main Menu**	Press to return to the **Main Menu** screen.	

Test Menu – Test Touch Panel



Using this test, normal or unusual operation of the connected analog touch screen can be determined.

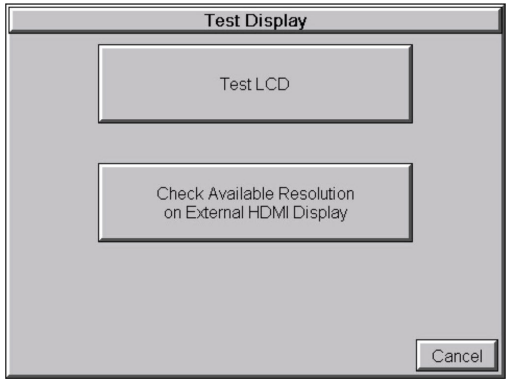
Testing:

If an area of the touch screen is suspected to be inoperable, touch that area of the screen while in the Test Touch Panel screen mode. The screen pixels should turn black in that area. If the screen pixels do not turn black when touched, then the touch screen is defective or needs to be calibrated. See Setting - Adjust Touch Screen

Item No.	Function	Description	Comments
1	**Touch area**	Touch to turn on pixels on the screen.	Both the title bar (Test Touch Panel) and **Cancel** button can be drawn across to test the touch operation.
2	**Cancel**	Press to return to the Test Menu screen.	

NOTE: *The touch screen driver is designed to respond to a single touch. If it is touched at multiple points at the same time, an unexpected object may be activated.*

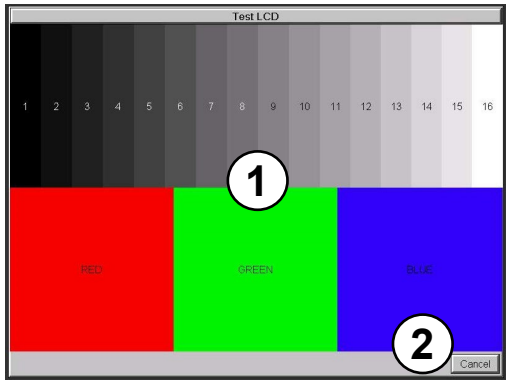
Test Menu – Test Display



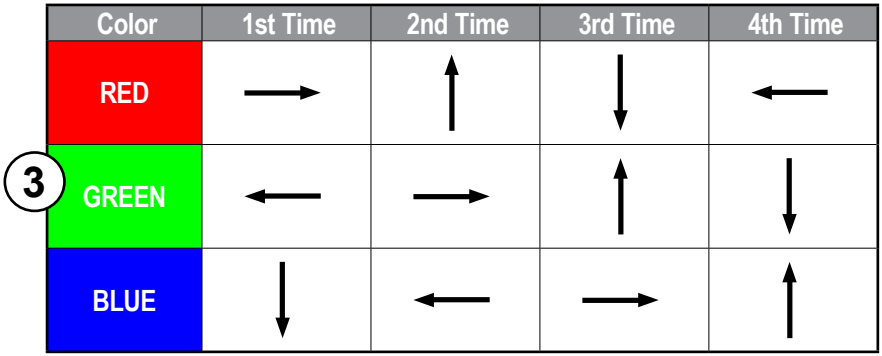
1) Test LCD

There are two different test patterns that may be run on the display to allow the user to check for display screen defects. If an attached touch screen is not touched or a connected mouse is not clicked within 3 seconds of **Test Pattern 1** being displayed, then **Test Pattern 2** will be displayed until the screen is touched or a connected mouse is clicked, otherwise **Test Pattern 1** will remain until cancelled.

Test Pattern 1 displays a test pattern of 16 grayscale graduations and RGB colors.



Test Pattern 2 will follow the pattern as shown in the following chart with the color wiping across the screen in the direction indicated by the arrows, then repeats:



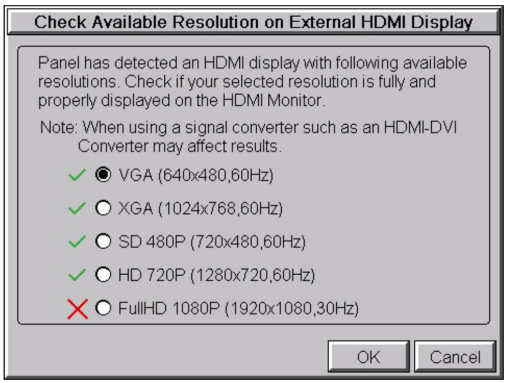
Item No.	Function	Description	Comments
1	**Touch the Test Display screen**	Press the screen anywhere except the Cancel button and the shown **Test Pattern 1** remains.	If the **Test Display** screen is not touched, then in three seconds the display will move to **Test Pattern 2**.
2	**Cancel (Test Pattern 1)**	Press to return to the **Test Menu** screen.	
3	**Touch Anywhere (Test Pattern 2)**	Touch the sceen anywhere during **Test Pattern 2** and return to the **Test Menu** screen.	

Test Results: If any pixels on the screen do not appear the same color as the surrounding pixels, the screen may be defective.

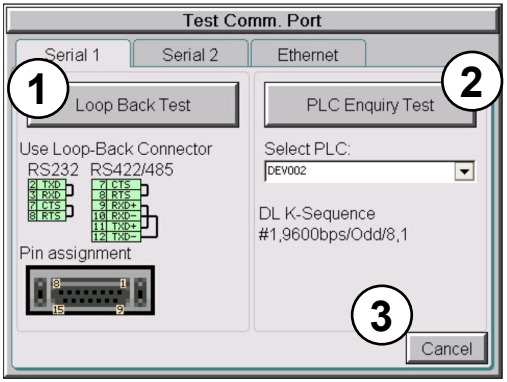
2) Check Available Resolutions on External HDMI Display

This selection performs a check through the HDMI port and attempts to negotiate with a connected display and determine all available resolutions.

NOTE: *If the display is connected through a signal converter such as an HDMI-DVI converter, the negotiations may not be sucessful and the available resolutions may not be correct.*



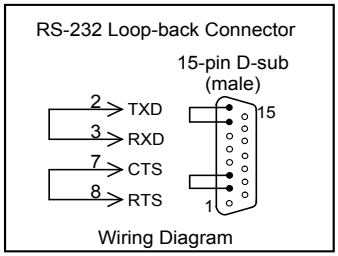
Test Menu – Test Communication Ports: Serial Ports

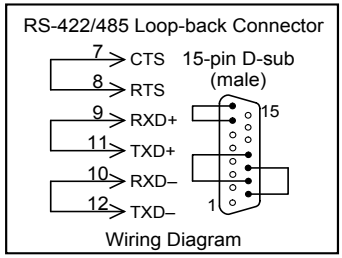


The following test can be used to check the operation of the serial communication ports, with the use of a loop back connector and can also check the serial communications to any connected and configured PLC.

Item No.	Function	Description	Comments
1	**Loop Back Test**	The loop back test checks the hardware components of the selected port for proper operation.	The loop back test may be performed on Serial Port 1 or Serial Port 3. Each tab shows diagrams to assist the user in building the loop back connector.
2	**PLC Enquiry Test**	This function allows the ability to select any PLC that that may be connected to the HMI via a serial connection and checks to see if the communications are working correctly.	The PLC must be configured for the selected port in the ***C-more*** programming software Panel Manager and transferred to the HMI before attempting the PLC Enquiry test.
3	**Cancel**	Press to return to the **Test Menu** screen.	

Serial Port 1





Test Menu – PLC Serial Comm Port – Loop Back Test

Test Results

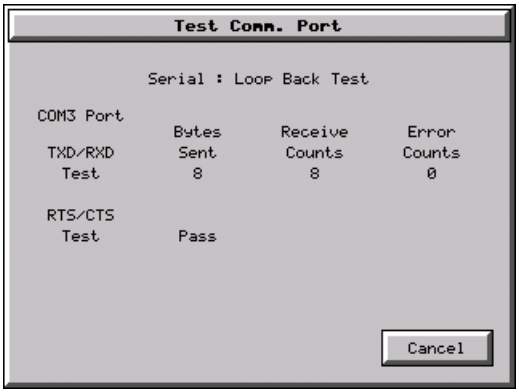
1.) Bytes Sent:
The number of bytes sent after a test is started.

2.) Receive Counts:
The number of bytes which are received after the test is started.

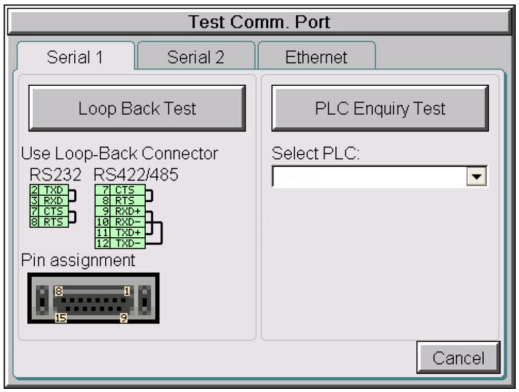
3.) Error Counts:
The number of bytes which have not been received after the test is started.

4.) RTS/CTS Test: Pass/Fail
RTS is turned on and if CTS receives the signal then the test shows "Pass," otherwise the test shows "Fail."

NOTE: *The test will continue to run until the Cancel button is pressed. If there are any error counts, check the loop back connector.*



Test Menu – PLC Enquiry Test: Serial Connection



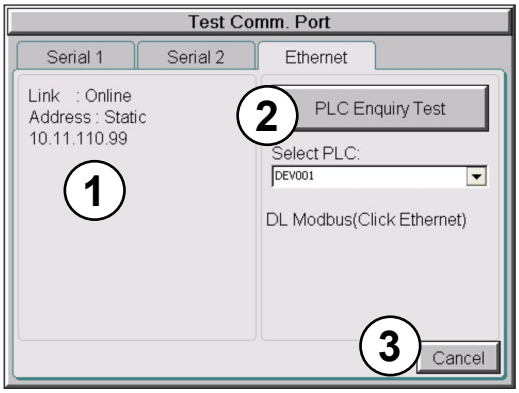
This function allows the ability to select any PLC that may be connected to the HMI through the selected serial comm port connection and checks to see if the communications are working correctly.

NOTE: *The communications protocol for the PLC being selected must be configured the same as the* ***C-more*** *HMI. The HMI's PLC serial communications are configured using the* ***C-more*** *Programming Software's Panel Manager.*

PLC Enquiry Test

Four test packets are sent to the selected PLC. The test result with return either Pass or Fail.

Test Menu – Test Communication Ports: Ethernet



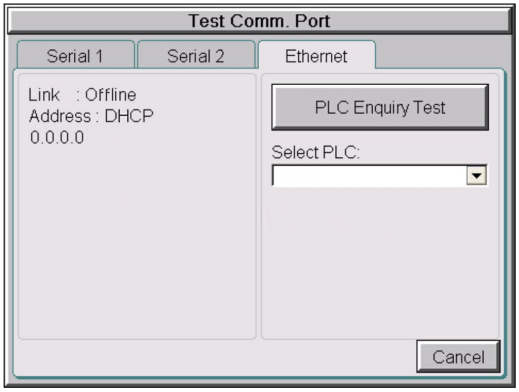
The following test feature can be used to check the operation of the Ethernet communication port by indicating if an Ethernet link has been established or not. It can also check the status of the Ethernet communications to any connected PLC.

Base featured models (-R) do not include an Ethernet port. Therefore, this check is not displayed on -R models.

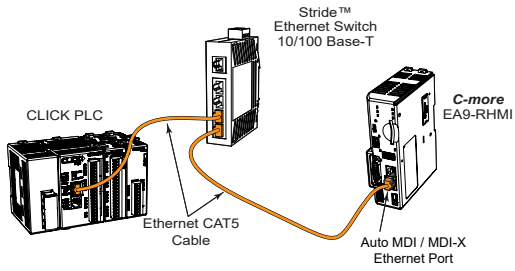
NOTE: *The communications protocol for the PLC being selected must be configured the same as the* ***C-more*** *HMI. The HMI's PLC serial communications are configured using the* ***C-more*** *Programming Software's Panel Manager...*

Item No.	Function	Description	Comments
1	**Ethernet Connected**	This area displays information on whether or not an Ethernet link has been established for the HMI's Ethernet comm port. Displays panel's IP address and shows whether it is static or assigned by a DHCP server.	
2	**PLC Enquiry Test**	This function allows the ability to select any PLC configured in the project that may be connected to the HMI via an Ethernet connection and checks to see if the communications are working correctly.	The PLC must be configured for the selected port in the ***C-more*** programming software Panel Manager and transferred to the panel before attempting the PLC Enquiry test.
3	**Cancel**	Press to return to the **Test Menu** screen.	

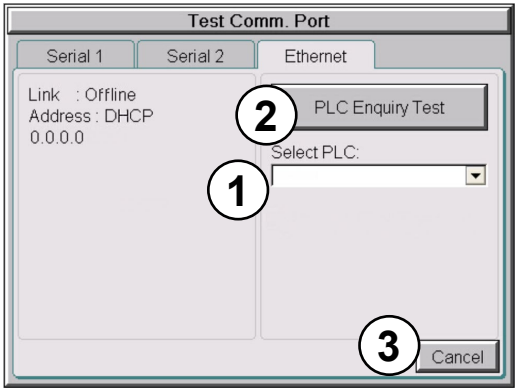
Example of displayed message when the HMI's Ethernet port is not connected. Note that the address resets to 0.0.0.0 even if it has previously been entered.



Typical Ethernet connection with Ethernet switch



Test Menu – PLC Enquiry Test: Ethernet Connection



This function allows the ability to select any PLC configured in the project that may be connected to the HMI through an Ethernet port connection and checks to see if the communications are working correctly.

NOTE: *The communications protocol for the PLC being selected must be configured the same as the* ***C-more*** *HMI. The HMI's PLC serial communications are configured using the* ***C-more*** *Programming Software's Panel Manager.*

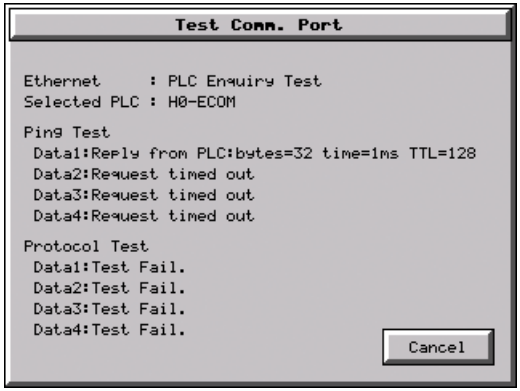
PLC Enquiry Test

Following are the steps that the Ethernet PLC Enquiry Test performs:

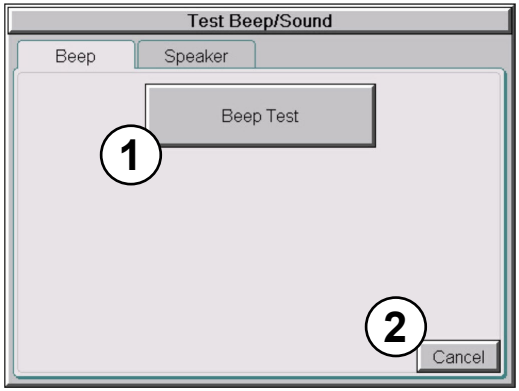
1) Ping the network 4 times for the PLC selected.

2) Four of the test read packets are sent to the selected PLC.

The test result will either be Pass or Fail. However, if the result of pinging the network shows an error, the test is stopped.

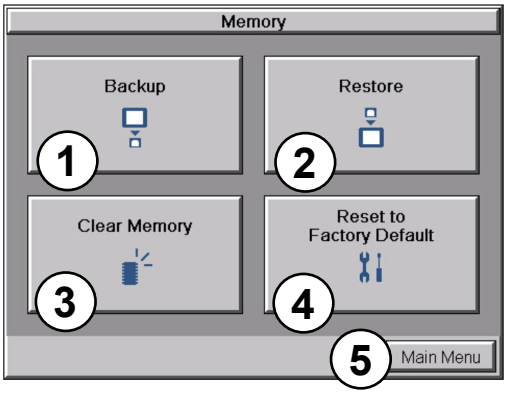


Test Menu – Test Beep/Sound



The internal Beeper can be tested from this system setup screen whether the Beeper is enabled or disabled. After the **Beep Test** button is pressed and released, the Beeper will sound for 500 msec.

Memory Menu



The user's project, Firmware and OS, log and recipes files can be backed up to or restored from an SD memory card or a USB memory device. From this menu the user can also clear the project log files. The user also has the ability to clear the memory within the ***C-more*** HMI.

5

Item No.	Function	Description	Comments
1	**Backup**	Backup project, Firmware and OS, log & recipe files to the following memory devices: USB port - Type A: USB pen drive SD Card Slot: SD card	Any USB 2.0 pen drive. SD formats SD and SDHC are supported. Capacity up to 32GB. The backup data files are created and copied to a folder on the memory device named "EA_Memory Copy." The project file is named StartupStorage.eas9 "Log" and "Recipe" folders with the appropriate data files are also created on the memory device.
2	**Restore**	Restore project, Firmware and OS, log & recipe files to the internal memory from one of the following memory devices: USB port - Type A: USB pen drive SD Card Slot: SD card	A folder on the memory device named "EA_Memory Copy" must exist containing a file named "StartupStorage.eas9". The project data file is stored in this file, and if the system data file was backed up, it also will be stored in this file. Any backed up log or recipe data files will be located under the appropriate "Log" or "Recipe" folders.
3	**Clear Memory**	Clear selected data files from the memory of the following internal memory or external memory devices: Built-in FLASH Memory USB port - Type A: USB pen drive SD Card Slot: SD card	Can only clear project, log and recipe data files of the Built-in FLASH memory. Can clear entire contents or individual data files of external memory devices.
4	**Reset to Factory Default**	The HMI's internal memory is set to the original factory defaults.	Clears all project memory.
5	**Main Menu**	Press to return to the **Main Menu** screen.	

NOTE: *The Project is RESTORED to the panel from an external memory device. A project can be TRANSFERRED to an SD card or USB memory from the programming software to be RESTORED to a panel that is not connected to the programming software. This file has the .eas9 extension NOT the .eap9 extension of a projects SAVED from the software.*

Project Executed from SD Card Slot 1

If the Project Storage/Boot Location is set to Auto or SD1 in the ***C-more*** software Panel Manager, and an SD memory card is located in the SD Card Slot 1 at the time a project is transferred to the panel, the project will be stored on the SD card and the Internal Project Memory will be cleared.

If Slot 1 contains an SD memory card with a project and the HMI's power is cycled, then the project file stored on the SD card is loaded into the HMI's internal memory and executed. Any project in the internal FLASH memory is cleared.

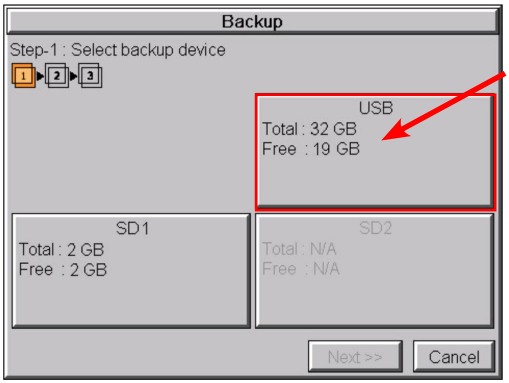
WARNING: During power up with an SD memory card plugged into an SD card slot, do not remove the memory card from the slot. Damage to the SD memory card and possibly the HMI may result.

WARNING: After a firmware update, the project files which are located in either the HMI's internal FLASH memory or an SD memory card plugged into an SD card slot are cleared. The programming software will need to be used to transfer the project file back into the panel. If you wish to retain the project on the SD memory card, power down the HMI and remove the SD card before performing a firmware upgrade.

Increasing Project Memory Size using an SD memory card:

If a project is transferred to the panel with an SD memory card in SD slot 1, the Font and Recipe data files are not included in the 82MB project size. Therefore using an SD memory card can allow a project to be loaded that is larger than 82MB if the excessive size is caused by Fonts and/or Recipe Sheets.

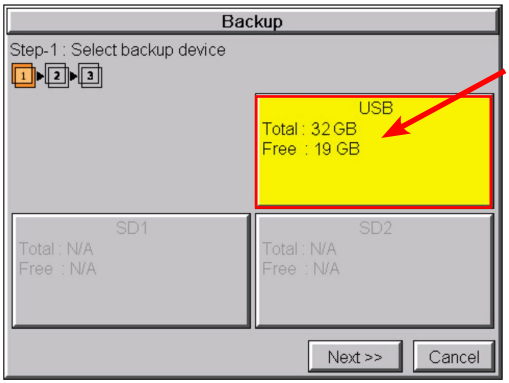
Memory – Backup



The Memory - Backup selection allows you to backup the panel's **Project**, **Log** files, **Recipe** files or even the **Firmware** files to either an SD memory card or **USB** pen drive. The available memory devices will be displayed with their total and free memory.

If the device is not available, it will be grayed out. The **Next** button is grayed out until a device is selected.

The **Cancel** button can be pressed at any time to return to the **Memory Menu** screen.



This is an example of selecting a USB memory device to write the backed up files to.

The selected device is highlighted. Pressing again deselects it.

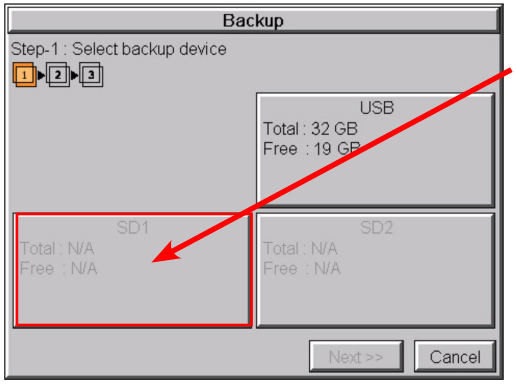
Even if there is only one available memory device, it still needs to be highlighted in order to go to the next step.

Press the Next button to continue to Step 2.

Please read the explanation for the availability of SD1 under different conditions that follow:

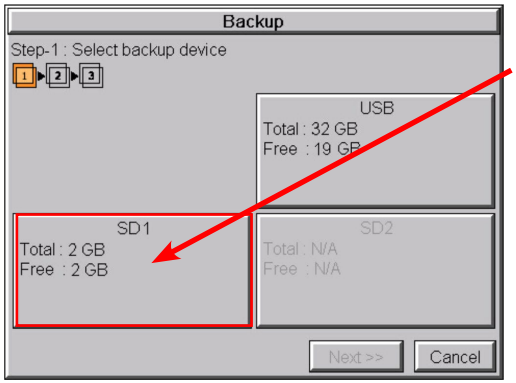
Memory – Backup (cont'd)

SD Card Slot1 Availability Explanation:



SD1 may be unavailable (grayed out) if there is no card in SD Slot 1 or the card in SD slot 1 has the project currently running on the panel stored on it.

The project will exist on SD1 if the SD card was installed in SD1 when the project was TRANSFERRED to the panel by the ***C-more*** programming software.

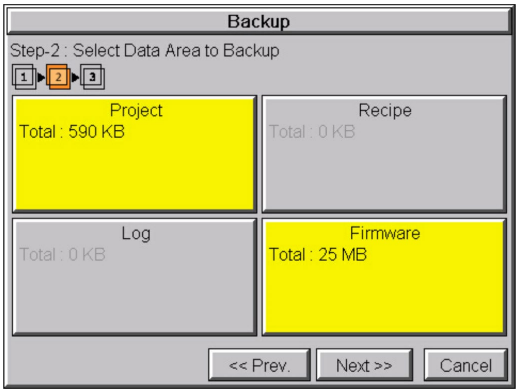


If the panel is powered up or rebooted with an SD card inserted into SD1 Slot, then the SD1 button's Total and Free memory will be displayed.

Memory – Backup (cont'd)

NOTE: *The following definitions are for the various file types that can be backed up:*
Project data – *consists of the actual developed project data that is created in the* ***C-more*** *programming software and includes all functionality, objects, screens, tag names, labels, comments, graphics, etc. Included in backup file name StartupStorage.eas9.*
Recipe data – *consists of all the data values and labels that have been created for the various recipe sheets. Includes all recipe sheets loaded to the panel. Only recipe sheets used in the project are loaded to the panel.*
Firmware – *consists of the operating system, firmware and run time files. Included in backup file name StartupStorage.eas9.*
Log data – *consists of the Alarm Log, Message Log and Trend Data Logging files.*

Select the data file(s) to be backed up by pressing the appropriate data file button. The selection will be highlighted.



Pressing the highlighted data file button again will turn it off.

The Next >> button will stay grayed out until at least one data file is selected.

Any file type not available will be grayed out.

The Next >> button is now enabled.

Pressing Cancel will return to the previous menu.

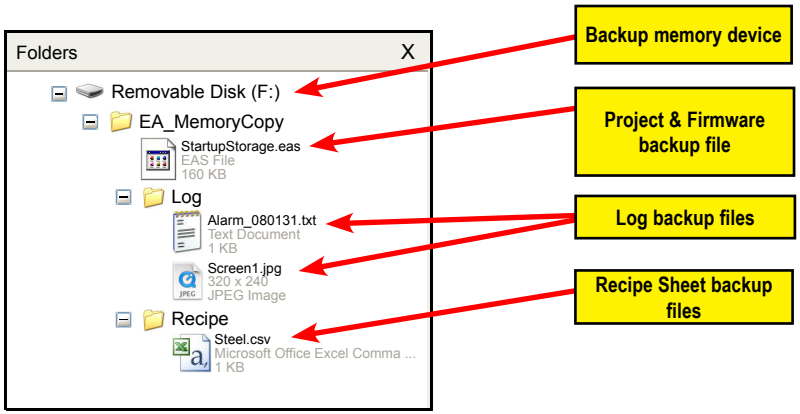
Press the Next button to continue.

NOTE: *In the case of the* ***Project*** *and* ***Firmware*** *files, these can be* ***Restored*** *later to another panel.*
Recipe *files can be edited externally from the panel and then* ***Restored*** *to the panel.*
The ***Log*** *files are for viewing purposes only.*
See ***Memory - Restore*** *later in this chapter for instructions on Restoring the Project, Firmware and/or Recipe files to a Panel.*

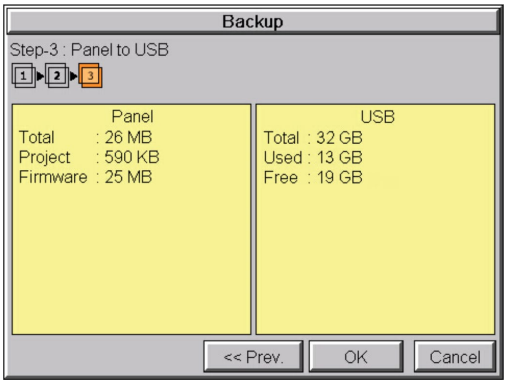
Memory – Backup (cont'd)

Backup Data Files Naming and Organization

The following graphic shows how the various data files are organized on the memory device when doing a **Backup** and also the file naming convention that is used when viewed in Windows® File Explorer on a PC.



Memory – Backup (cont'd)



The next system setup screen allows the verification of the data file selections. When the OK button is pressed, the backup begins.

The user can return to the previous screen by pressing the << Prev button.

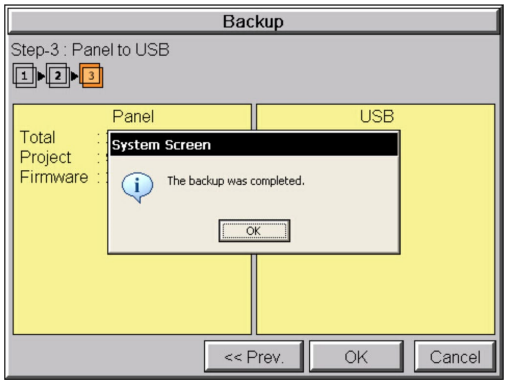
This message is displayed during the **Backup** copying process. Press the **Cancel** button to abort the backup.

The following text is shown in the copying progress message box:

Copy to USB Memory:
"Please do not Power Off and Remove USB"

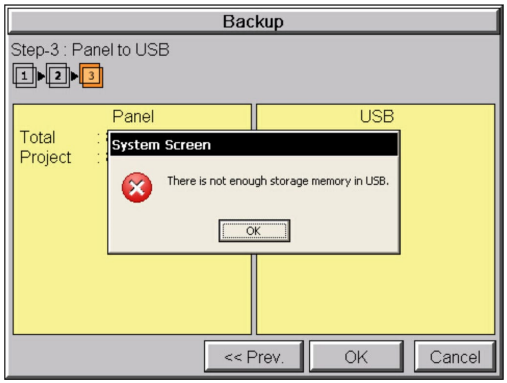
Copy to SD1:
"Please do not Power Off and Remove SD"

WARNING: During the copying process do not power off the HMI or remove the memory device.



This message is displayed to indicate the **Backup** is complete. Press the **OK** button to return to the previous menu selection.

Memory – Backup (cont'd)

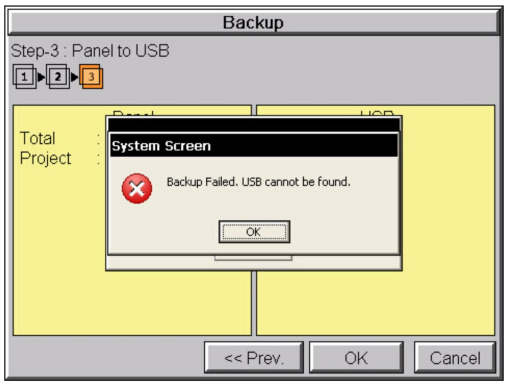


Warning Messages

If the destination does not have enough space to store the selected memory size, then the message shown here will be displayed. Press the **OK** button to clear the warning message.

The warning message will read "There is not enough storage memory in %Device%."

%Device% will show either "SD1" or "USB."

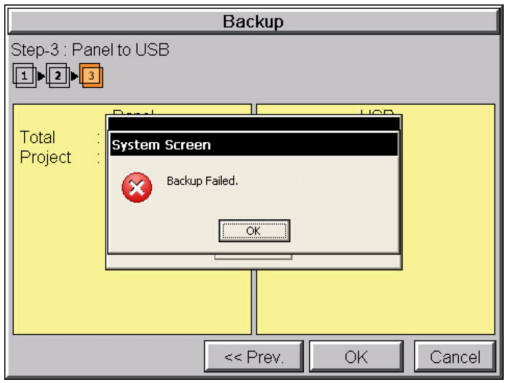


This warning message will be displayed if the backup Memory device fails or is removed during the backup. Press the OK button to clear the warning message.

The warning message will read "Backup Failed. "%Device% cannot be found."

%Device% will show either "SD1" or "USB."

Refer to **Chapter 8: Troubleshooting** for additional help.

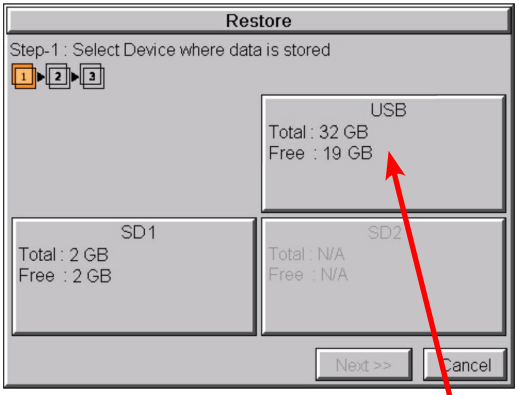


For any other reason the backup fails, then this warning message will be displayed. Press the **OK** button to clear the warning message.

The warning message will read "Backup Failed."

Refer to **Chapter 8: Troubleshooting** for additional help.

Memory – Restore



The **Memory - Restore** function is used to:

1.) **Restore** a project previously backed up on an SD card or USB pen drive memory device to the same panel. See **Memory - Backup** previously in this chapter.

2.) Copy a project from one panel to another panel using a memory device to physically transport the data files.

3.) **Restore** a project into the panel that was transferred to an "External Memory Device" using the ***C-more*** Programming Software.

4.) **Restore Recipe Sheet(s)** previously backed up to a memory device or copied to the memory device using a PC.

The available memory devices will be displayed showing the total and free available memory for that device. If the device is not available, it will be grayed out. The **Next** button is grayed out until a device is selected.

The **Cancel** button can be pressed at any time to return to the **Memory Menu** screen.

This is an example of a USB memory device selected to be the source for restoring the data file(s).

The selected device is highlighted. Pressing again deselects it.

Even if there is only one available memory device, it needs to be highlighted in order to go to the next step.

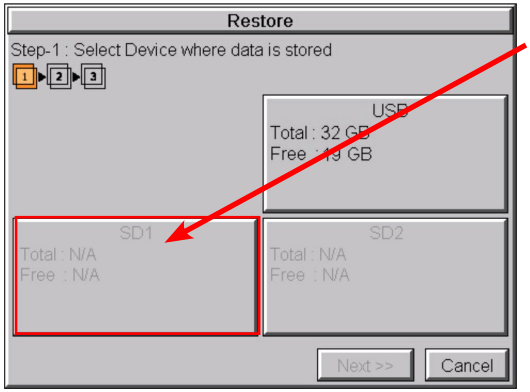
Press the **Next** button to continue to Step 2.

NOTE: *If you have a memory device inserted into the proper port on the HMI, but it doesn't show up as highlighted in Step 1 of the* ***Backup*** *setup screen, then try a different device to determine if the memory device is defective or if there is a possible problem with the memory device connection. It may not be compatible with the panel. Some USB pen drives are not USB 2.0 compatible and will not work with* ***C-more*** *HMIs. Some USB pen drives may take several minutes before they are recognized by the panel.*
SD cards must be formatted using the SD formatter provided by ***SDcard.org***

Memory – Restore (cont'd)

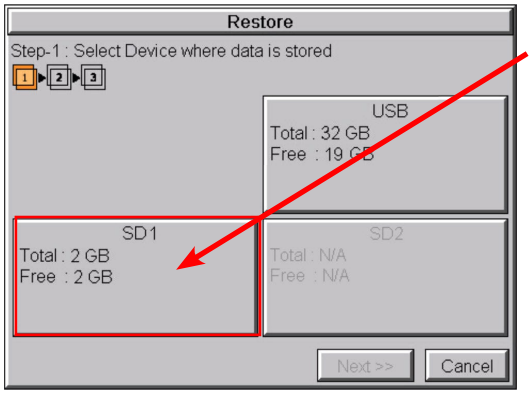
Please read the explanation for the availability of SD1 under different conditions as shown on this page and the next.

SD1 Availability Explanation:



SD1 may be unavailable (grayed out) if there is no card in SD Slot 1 or the card in SD slot 1 has the project currently running on the panel stored on it.

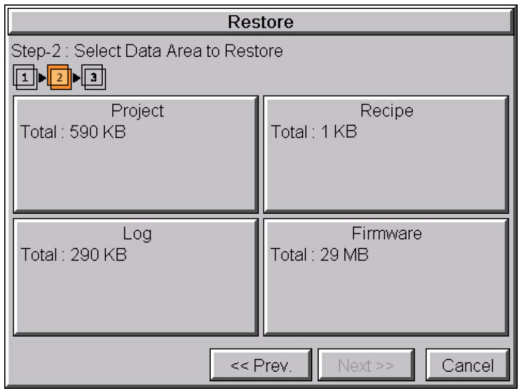
The project will exist on SD1 if the SD card was installed in SD1 when the project was TRANSFERRED to the panel by the ***C-more*** programming software.



If the panel is powered up or rebooted with an SD card inserted into SD1 Slot, then the SD1 button's Total and Free memory will be displayed.

NOTE: *The following definitions are for the various file types that can be restored:*
Project data – *consists of the actual developed project data that is created in the* ***C-more*** *programming software and includes all functionality, objects, screens, tag names, labels, comments, graphics, etc. Included in backup file name StartupStorage.eas9.*
Recipe data – *consists of all the data values and labels that have been created for the various recipe sheets. Includes all recipe sheets loaded to the panel. Only recipe sheets used in the project are loaded to the panel.*
Firmware – *consists of the operating system, firmware and run time files. Included in backup file name StartupStorage.eas9.*
Log data – *consists of the Alarm Log, Message Log and Trend Data Logging files.*

Memory – Restore (cont'd)

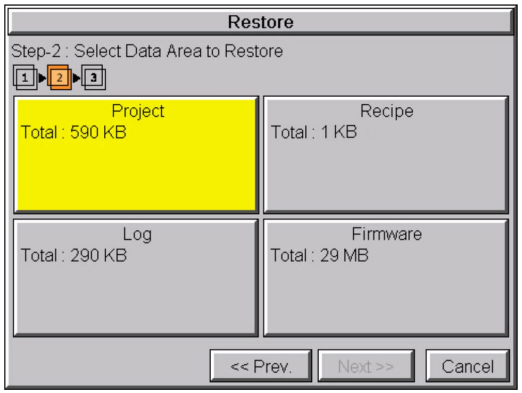


Select the data file(s) to be restored by pressing the appropriate data file button. The selection will be highlighted. The data file can be either the **Project, Firmware** and/or **Recipe files**. The selected data is restored to the internal built-in memory if there is no SD card inserted into the SD1 slot.

Pressing the highlighted data file again will turn it off.

The **Next >>** button will stay grayed out until at least one data file is selected.

Any file type not available will be grayed out.



This is an example of a file selected to restore.

The selected file is highlighted.

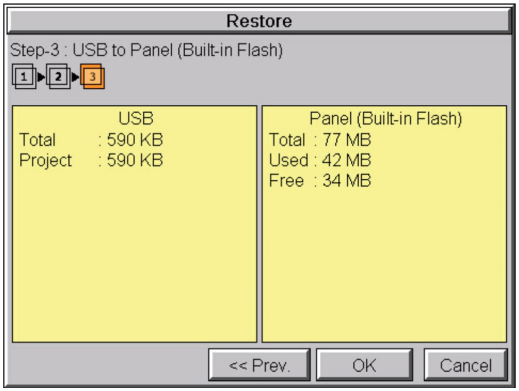
The **Next >>** button is now enabled.

Pressing **Cancel** will return to the previous menu.

Press the **Next** button to continue.

NOTE: *The following definitions are for the various file types that can be restored:*
Project data – *consists of the actual developed project data that is created in the* ***C-more*** *programming software and includes all functionality, objects, screens, tag names, labels, comments, graphics, etc. Included in backup file name StartupStorage.eas9.*
Recipe data – *consists of all the data values and labels that have been created for the various recipe sheets. Includes all recipe sheets loaded to the panel. Only recipe sheets used in the project are loaded to the panel.*
Firmware – *consists of the operating system, firmware and run time files. Included in backup file name StartupStorage.eas9.*
Log data – *consists of the Alarm Log, Message Log and Trend Data Logging files.*

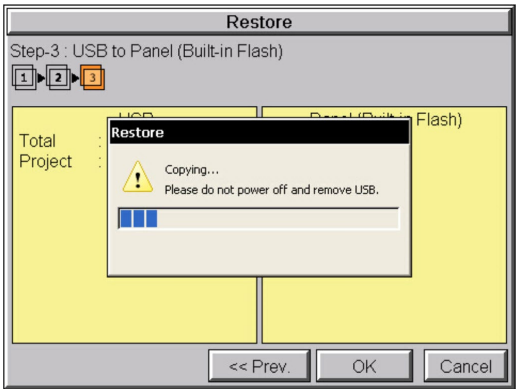
Memory – Restore (cont'd)



The data selected to restore is checked. If the data is good, then the **OK** button can be pressed to start the restore.

If there is a problem with the data, the **OK** button will remain grayed out and the user can return to the previous screen by pressing the **<< Prev** button.

The problem could be caused by a corrupted data file. See **Chapter 8: Troubleshooting** for additional help.



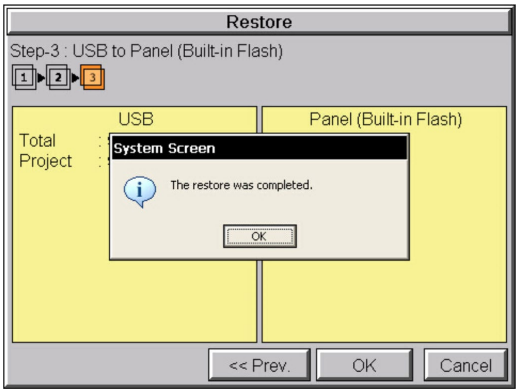
This message is displayed during the **Restore** process. Press the **Cancel** button to abort the backup.

The following text is shown in the copying progress message box:

Copy to USB Memory:
"Please do not Power Off and Remove USB"

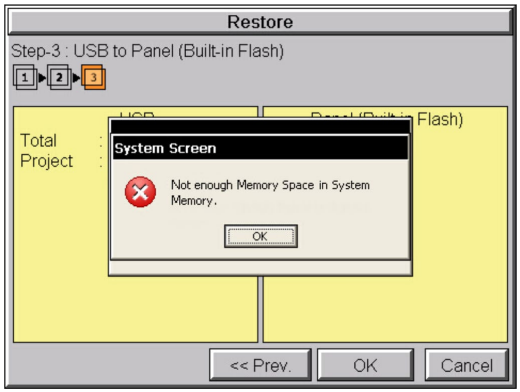
Copy to SD1:
"Please do not Power Off and Remove SD card"

WARNING: During the copying process. Do not power off the HMI or remove the memory device.



This message is displayed to indicate the **Restore** is complete. Press the **OK** button to return to the previous menu selection.

Memory – Restore (cont'd)

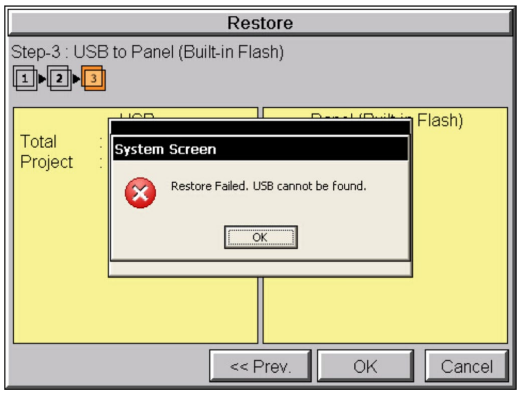


Warning Messages:

If the system memory does not have enough space to restore the selected memory size, then the message shown here will be displayed. Press the **OK** button to clear the warning message.

The warning message will read "Not enough Memory Space in System Memory."

The Project size must be less than 40 MB.

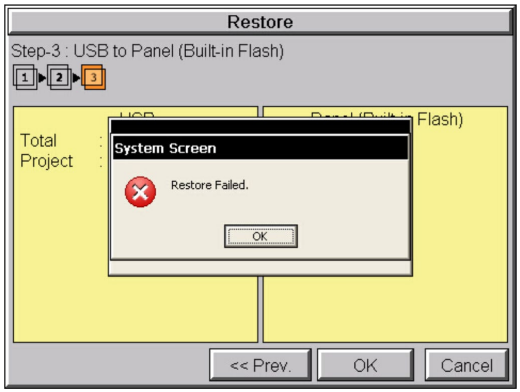


This warning message will be displayed if the restore Memory device fails or is removed during the backup. Press the **OK** button to clear the warning message.

The warning message will read "Restore Failed. "%Device% cannot be found."

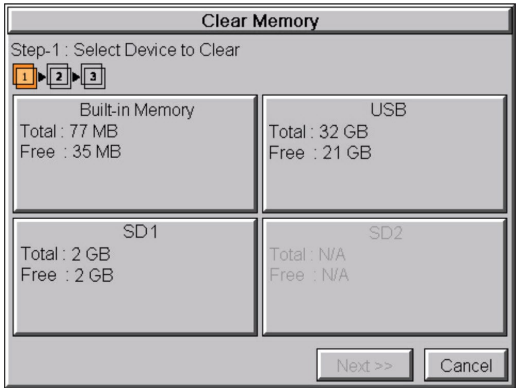
%Device% will show show "SD1" or "USB."

Try using a different device with known good data in the same connector or using the device that is causing the error in a different connector.



For any other reason the restore fails, then this warning message will be displayed. Press the **OK** button to clear the warning message.

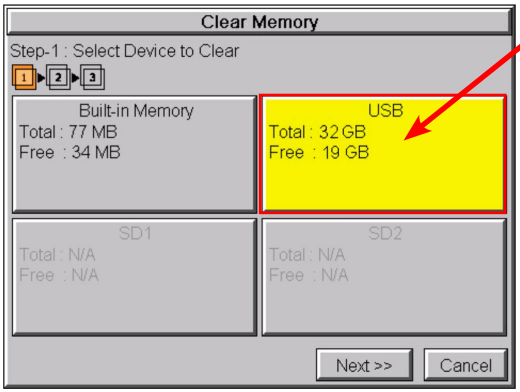
Memory – Clear Memory



This function is used to clear individually selected data files, or all data files, within the panel's **Built-in Memory** or any installed memory device such as a USB pen drive or an SD card.

Select the memory device to clear. If the device is not available, it will be grayed out.

The Next button is grayed out until a device is selected.

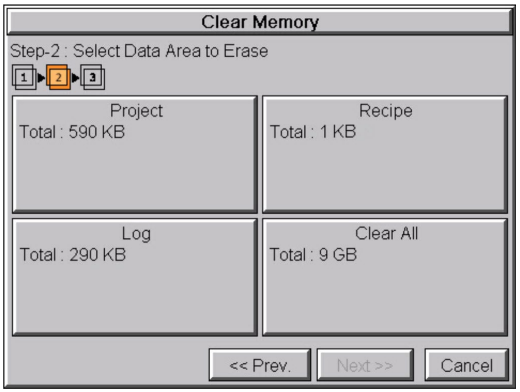


The selected device is highlighted. Pressing again deselects it.

When there are more than two available backup devices, the one selected will be highlighted. If another is selected, then the highlight will change to the last one pressed. Only one device can be selected at a time.

Press the **Next** button to continue.

Memory – Clear Memory (cont'd)



Select the data file(s) to be cleared.

This is an example of an SD card or USB memory that was selected in **Clear Memory - Step-1**.

The selected file will be highlighted. Pressing again deselects it.

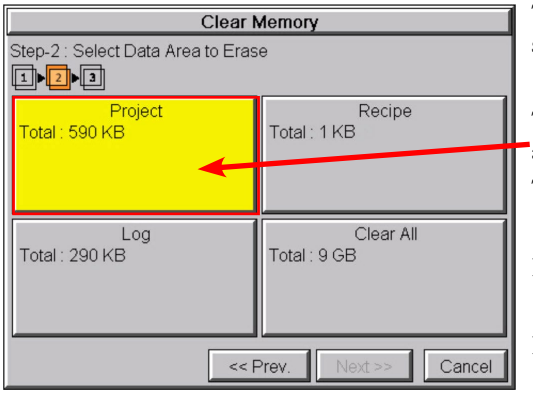
The **Next >>** button will stay grayed out until file(s) are selected.

Selecting **Clear All** will erase all files located on the memory device.

This is an example of **USB Memory** that was selected in **Clear Memory - Step-1**.

Notice the ability to select either the **Project** file, **Log** files, **Recipe** files, or the **System** files.

NOTE: *Firmware files cannot be cleared from internal memory.*



This is an example of the **Project** data file being selected for clearing.

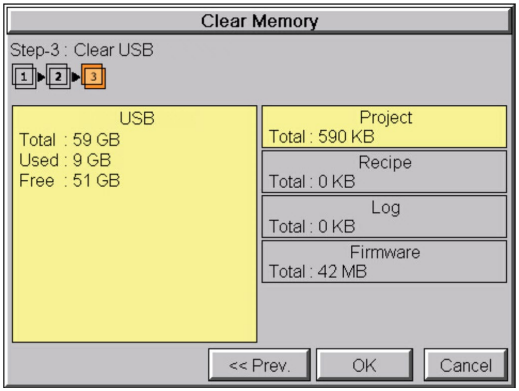
The selected memory area is highlighted. Pressing again deselects it.

The **Next >>** button is now enabled.

Pressing **Cancel** will deselect the file(s).

Press the **Next** button to continue.

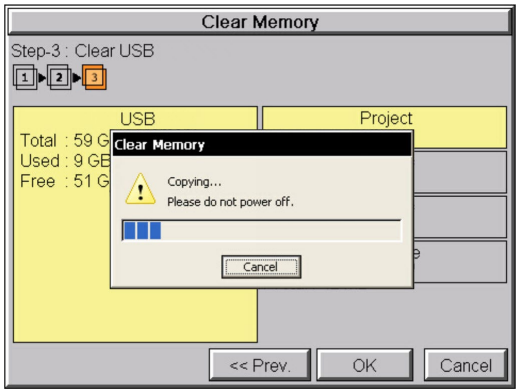
Memory – Clear Memory (cont'd)



The data file(s)selected to clear are checked. If the data file is good, then the **OK** button can be pressed to start the clear procedure.

If there is a problem with the data file, the **OK** button will remain grayed out and the user can return to the previous screen by pressing the **<< Prev** button.

Press the **OK** button to continue.



This message is displayed during the clearing process. Press the **Cancel** button to abort the clearing.

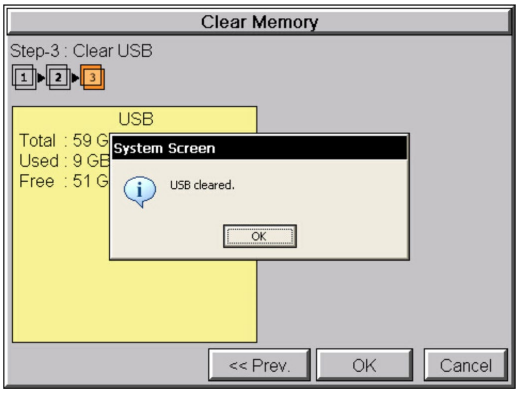
The following text is shown in the clearing progress message box:

Clearing Built-in Memory:
"Please do not Power Off"

Clearing USB Memory:
"Please do not Power Off or Remove USB"

Clearing SD1
"Please do not Power Off or Remove SD"

WARNING: During the clearing process, do not power off the HMI or remove the memory device.



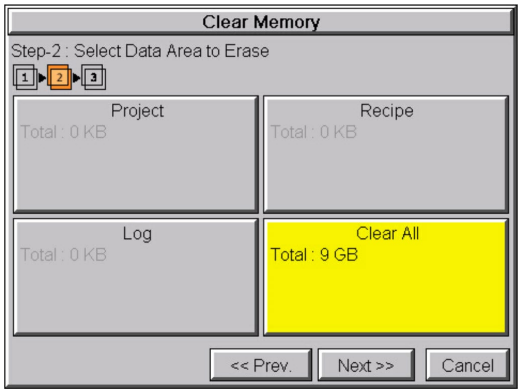
The following message is displayed when the clearing process is complete:

"%Device% cleared"

%Device% will show either "SD1," "SD2," or "USB."

Press the **OK** button to return to the **Memory Menu** screen.

Memory – Clear Memory (cont'd)



The following is an example of **Clear All** selected for clearing.

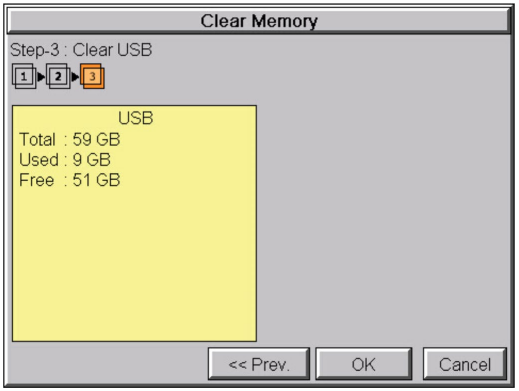
The selected device is highlighted.

The **Next >>** button is now enabled.

Pressing **Cancel** will deselect the **Clear All**.

5

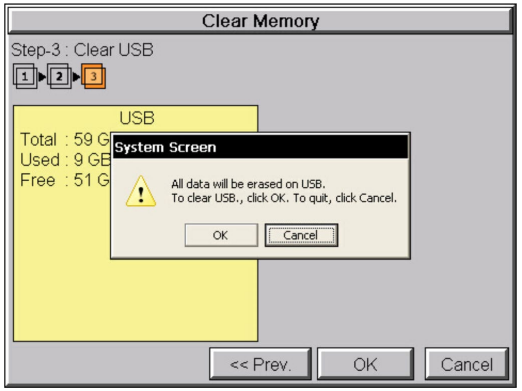
NOTE: *If Clear All is selected, all files will be erased from the memory device, even those not related to the* ***C-more*** *HMI.*



The data file(s)selected to clear are verified. If the data file is good, then the **OK** button can be pressed to start the clear procedure.

If there is a problem with the data file, the **OK** button will remain grayed out and the user can return to the previous screen by pressing the << Prev button.

Press the **OK** button to continue.

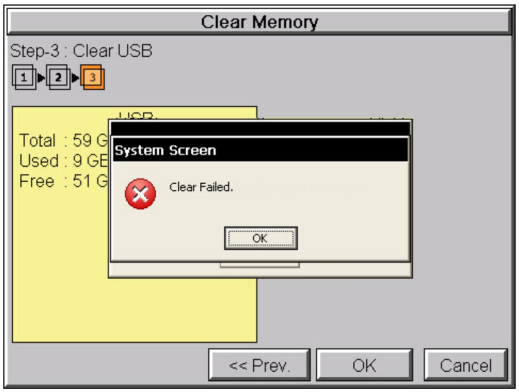


The warning message shown here will be displayed to give the user the opportunity to decide if they want to proceed or not.

Press the **OK** button to continue.

The **Clear All** process will start with a warning message as seen in the first example and continue until a message saying the device is cleared or a warning message as shown on the next page appears.

Memory – Clear Memory (cont'd)



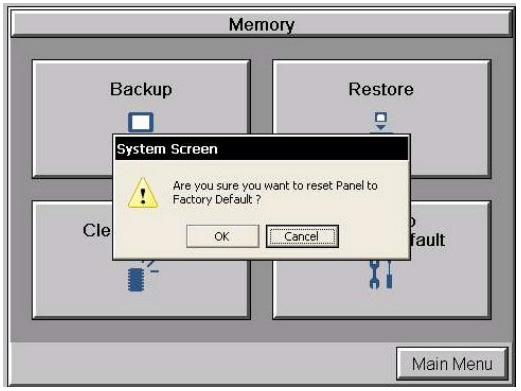
The warning message shown here will be displayed if the clearing process fails.

"Clear Failed."

Press the **OK** button to return to the **Clear Memory** screen and try again.

If the selected memory still fails to clear, then refer to **Chapter 8: Troubleshooting** for additional help.

Memory – Reset to Factory Default



After pressing the **Reset to Factory Default** button from the **Memory Menu**, the message box shown will be displayed.

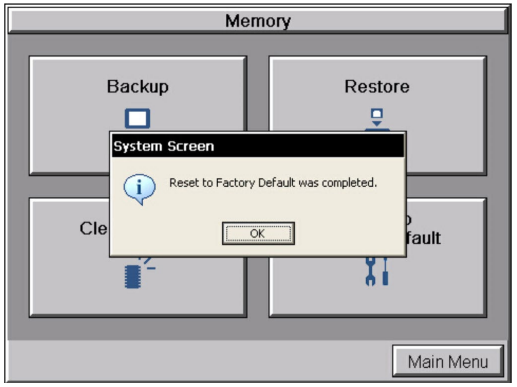
Resetting to the Factory Defaults produces the following actions:

1.) The project file is cleared.

2.) The log, recipe & WAV files are cleared.

4.) The IP address is set to DHCP.

WARNING: As a precaution, it is recommended to create a backup file to an SD card or USB storage device using the Memory Backup function before resetting to factory defaults.



The message shown here is displayed once the **Factory Default** values have been stored into the system memory.

Press **OK** to continue.

PLC COMMUNICATIONS

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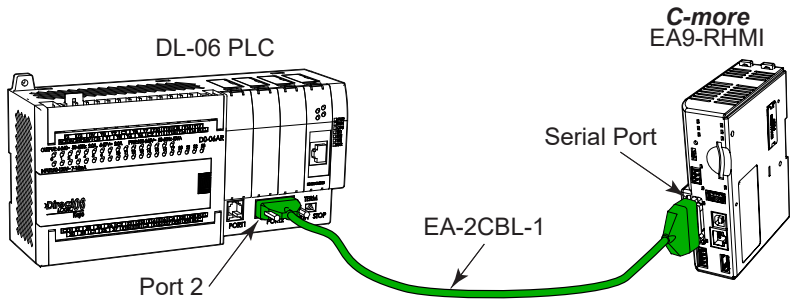
Introduction

The ***C-more*** family of HMIs are capable of communicating with a wide variety of Programmable Logic Controllers. ***C-more*** is capable of communicating over RS232, RS422 and RS485 serial networks as well as Ethernet networks. It communicates with all AutomationDirect PLC's utilizing various protocols. ***C-more*** also communicates with other brands of PLCs by their different protocols. The table on the next page lists all of the various PLCs and protocols that can be configured. The page after the protocol table lists the various serial communication cables that are available to purchase. The rest of this chapter is devoted to showing the pin-to-pin connections of all the available cables plus wiring diagrams that the users can refer to in order to construct their own cables, along with wiring diagrams of cables that are not available for purchase. To simplify RS422/RS485 wiring schemes, we have included wiring diagrams showing connections for available terminal connectors such as our ZIPLink Communication Adapter Module, p/n ZL-CMA15, used for example with our DL-06 and D2-260 PLCs.

If you have difficulty determining whether the particular PLC and/or protocol you are using will work with the ***C-more*** series of HMIs, please contact our technical support group at 770-844-4200

*Direct*LOGIC PLCs Password Protection

NOTE: *Many* ***Direct****Logic PLCs support multi-level password protection of the ladder program. This allows password protection while not locking the communication port to an operator interface. The multilevel password can be invoked by creating a password with an upper case "A" followed by seven numeric characters (e.g. A1234567). Please refer to the specific PLC user manual for further details.*



PLC Protocols

PLC Protocol Table			
Model			**Protocols**
AutomationDirect	Productivity Series		Productivity Serial
			Productivity Ethernet
	Do-more (BRX)	All	Do-more Serial
			Do-more Ethernet
	CLICK	All	CLICK Serial
		C0-1x series	CLICK Ethernet
	CLICK PLUS	C2-01CPU-x, C2-03CPU-x, All with C2-DCM	CLICK Serial
		All	CLICK Ethernet
	DL05/DL06	all	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		H0-ECOM/H0-ECOM100	***Direct*** LOGIC Ethernet
	DL105	all	K-Sequence
	DL205	D2-230	K-Sequence
		D2-240	K-Sequence
			Direct NET
		D2-250/D2-250-1/D2-260/D2-262	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		D2-240/D2-250-1/D2-260 Using DCM	***Direct*** NET
			Modbus (Koyo addressing)
		H2-ECOM/H2-ECOM100	***Direct*** LOGIC Ethernet
	DL305	D3-330/330P (Requires the use of a Data Communications Unit)	***Direct*** NET
		D3-340	***Direct*** NET
		D3-350	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D3-350 DCM	***Direct*** NET
			Modbus (Koyo addressing)
	DL405	D4-430	K-Sequence
			Direct NET
		D4-440	K-Sequence
			Direct NET
		D4-450/D4-454	K-Sequence
			Direct NET
			Modbus (Koyo addressing)
		All with DCM	***Direct***NET
			Modbus (Koyo addressing)
		H4-ECOM/H4-ECOM100	***Direct*** LOGIC Ethernet
	H2-WinPLC (Think & Do) Live V5.2 or later and Studio any version		Think & Do Modbus RTU (serial port)
	H2-WinPLC (Think & Do) Live V5.5.1 or later and Studio V7.2.1 or later		Think & Do Modbus TCP/IP (Ethernet port)
	GS Drives		GS Drives Serial
			GS Drives TCP/IP (GS-EDRV)
	SOLO Temperature Controllers (models with serial communications)		SOLO Temperature Controller

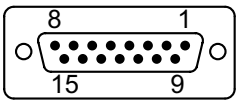
PLC Protocols (cont'd)

PLC Protocol Table (cont'd)		
Model		**Protocols**
Allen-Bradley	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-01/02/03	DH485/AIC/AIC+
	MicroLogix 1000, 1100, 1200, 1400 and 1500	DF1 Half Duplex; DF1 Full Duplex
	SLC 5-03/04/05	
	ControlLogix™, CompactLogix™, FlexLogix™	
	PLC-5	DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Tag Based	DF1 Half Duplex; DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Generic I/O Messaging	EtherNet/IP Server
	ControlLogix, CompactLogix, FlexLogix - Tag Based	EtherNet/IP Client
	MicroLogix 1100, 1400 and SLC 5/05, via native Ethernet port	
	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-03/04/05, all via ENI adapter	
	Micro 800 Series	Modbus RTU
		Modbus TCP
	Micro 800 Series - Tag Based	DF1 Full Duplex
		EtherNet/IP Client
GE	90/30, 90/70, Micro 90, VersaMax Micro	SNPX
	90/30, Rx3i	SRTP Ethernet
Mitsubishi	FX Series	FX Direct
	Q02, Q02H, Q06H, Q12H, Q25H	Q CPU
	Q, QnA Serial	QnA Serial
	Q, QnA Ethernet	QnA Ethernet
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx	Modbus RTU
	Other devices using Modicon Modbus addressing	Modbus RTU
		TUModbus TCP/IP
Omron	C200 Adapter, C500	Host Link
	CJ1/CS1 Serial	FINS
	CJ1/CS1 Ethernet	
Siemens	S7-200 CPU, RS-485 Serial	PPI
	S7-200 CPU, S7-300 CPU, S7-400, S7-1200 CPU Ethernet	Ethernet ISO over TCP

PLC Communication Cables & Wiring Diagrams

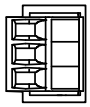
Cable Description	Cable Part Number
Communication cable, 15-pin D-shell male to 6-pin RJ12, 9.8ft/3m cable length. For use with ***C-more*** or ***C-more*** Micro panel and AutomationDirect PLCs with RJ12 ports.	**EA-2CBL**
Communication cable, 15-pin D-shell male to 15-pin D-sub HD15 male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a DL06, D2-250(-1), D2-260 or D2-262 (bottom port) CPU.	**EA-2CBL-1**
Communication cable, 15-pin D-shell male to 6-pin RJ11, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a D3-340 CPU top or bottom port.	**EA-3CBL**
Communication cable, 15-pin D-shell male to 15-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a DL405 (top port) CPU.	**EA-4CBL-1**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a D2-DCM, D3-232-DCU, D3-350 (bottom port) or DL405 (bottom port) CPU.	**EA-4CBL-2**
Communication cable, 15-pin D-shell male to 8-pin mini DIN male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley Micrologix CPU.	**EA-MLOGIX-CBL**
Communication cable, 15-pin D-shell male to 9-pin D-shell female, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley SLC 5/03, 5/04 or 5/05 CPU with DF-1 port.	**EA-SLC-232-CBL**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley PLC-5 CPU with a DF1 port.	**EA-PLC5-232-CBL**
Communication cable, 15-pin D-shell male to 6-pin RJ45, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Allen-Bradley SLC 5/01, 5/02 or 5/03 CPU with a DH485 port cable.	**EA-DH485-CBL**
Communication cable, 15-pin D-shell male to 15-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro and GE Fanuc Series 90/30 or 90/70 serial port.	**EA-90-30-CBL**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a Mitsubishi FX Series CPU.	**EA-MITSU-CBL**
Communication cable, 15-pin D-shell male to 8-pin mini DIN male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and a Mitsubishi FX Series CPU.	**EA-MITSU-CBL-1**
Communication cable, 15-pin D-shell male to 25-pin D-shell male, 3m/9.8ft cable length. For use with ***C-more*** or ***C-more*** Micro panel and an Omron C200 or C500 CPU.	**EA-OMRON-CBL**

Port1



D-Sub 15-pin female

***Port2**



RS-485 Serial Communications

***NOTE:** All cables for connections at Port 2 are user constructed. Refer to the specifications of the connected device port to construct the cable properly. The connector for Port2, EA9-3TB , is included with your **C-more** panel.*

Cables from *AutomationDirect* (cont'd)

Part No. EA-2CBL

Part No. EA-2CBL-1

Part No. EA-4CBL-1

Part No. EA-4CBL-2

Part No. EA-3CBL

Part No. EA-MLOGIX-CBL

Part No. EA-SLC-232-CBL

Part No. EA-PLC5-232-CBL

Part No. EA-DH485-CBL

Part No. EA-90-30-CBL

Part No. EA-MITSU-CBL

Part No. EA-MITSU-CBL-1

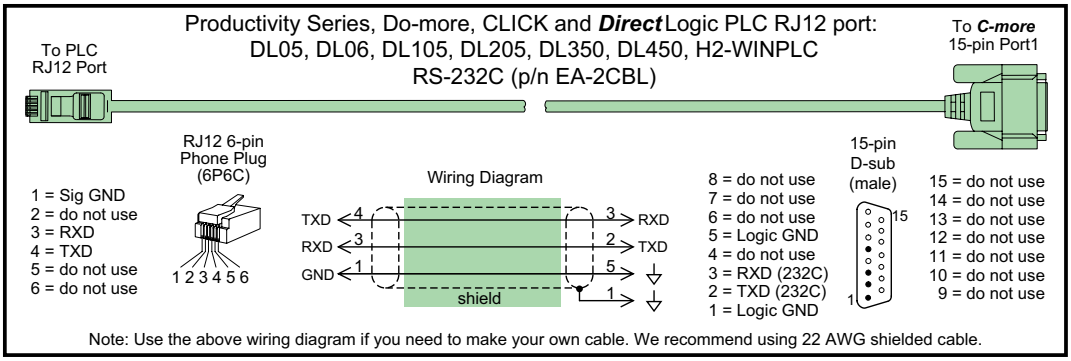
Part No. EA-OMRON-CBL

PLC Communication Cables & Wiring Diagrams (cont'd)

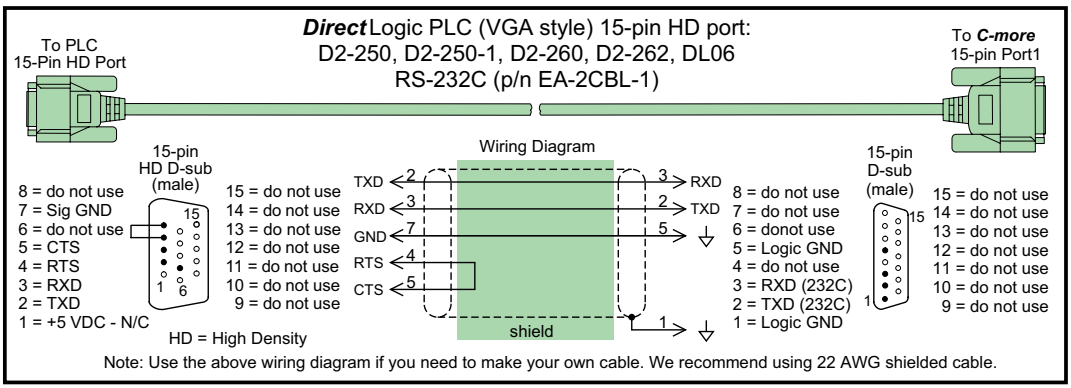
The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the ***C-more*** HMIs and various PLC controllers. Part numbers are included with the **pre-made cables** that can be purchased from ***AutomationDirect***. The information presented will allow users to construct their own cables if so desired.

AutomationDirect PLCs RS-232C Serial

EA-2CBL

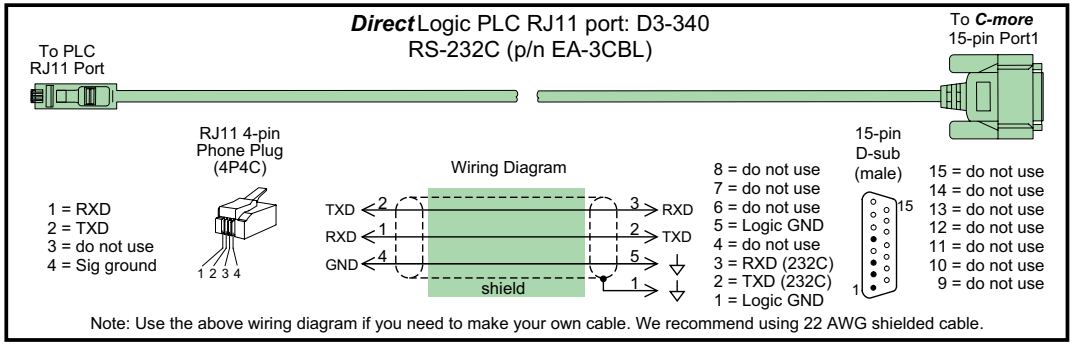


EA-2CBL-1



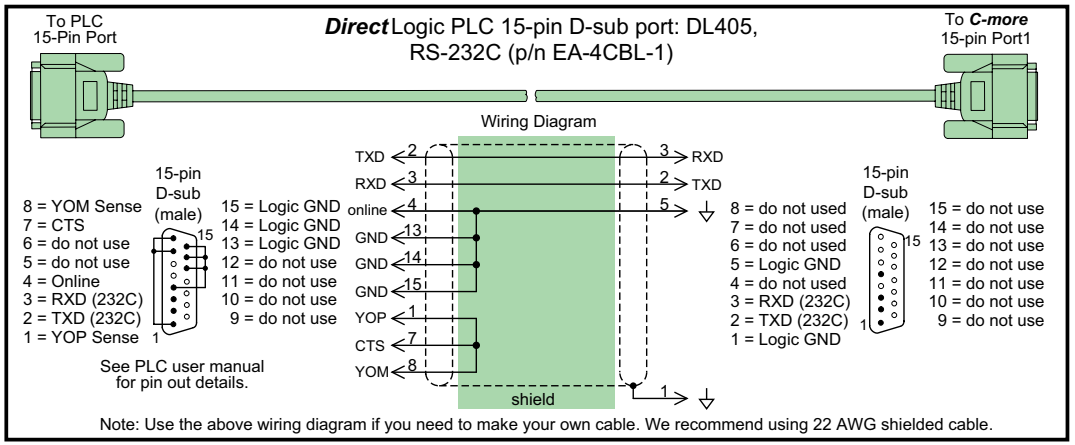
AutomationDirect PLCs RS-232C Serial (cont'd)

EA-3CBL



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

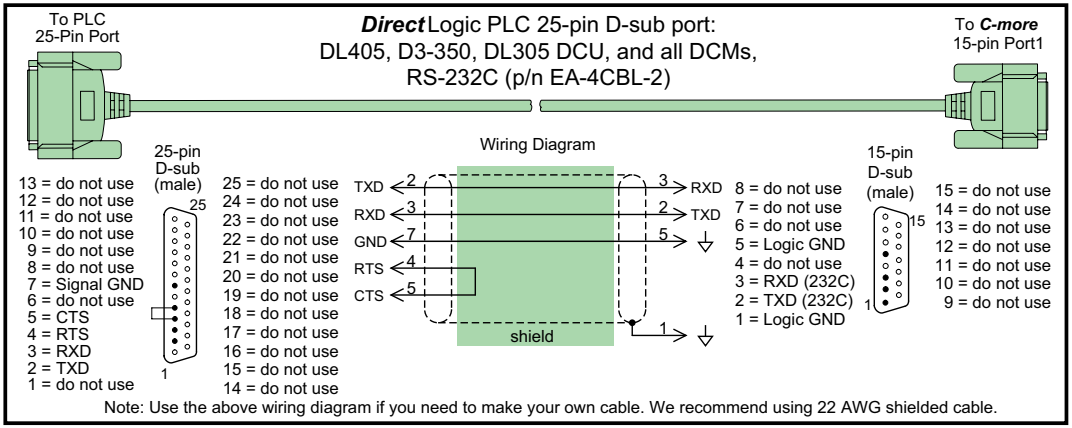
EA-4CBL-1



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

AutomationDirect PLCs RS-232C Serial (cont'd)

EA-4CBL-2

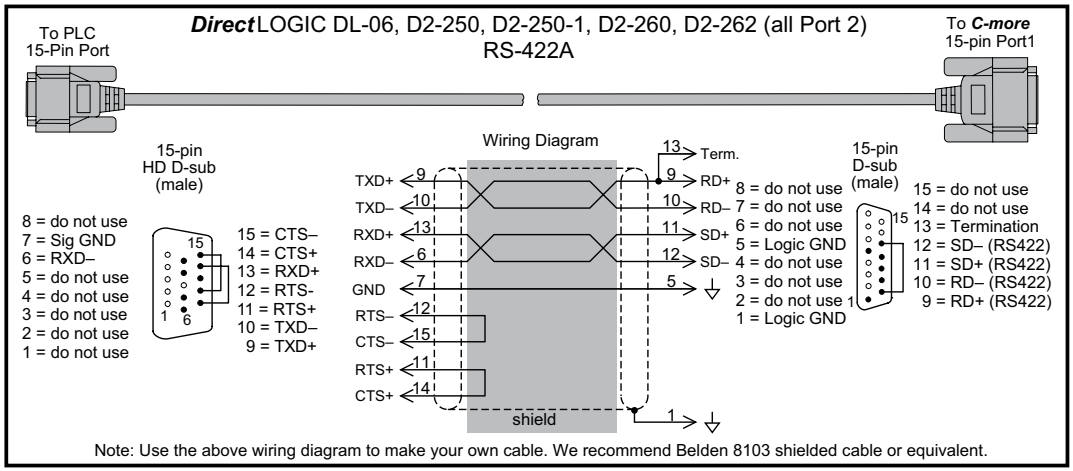


Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

AutomationDirect PLCs RS-422A/RS-485A

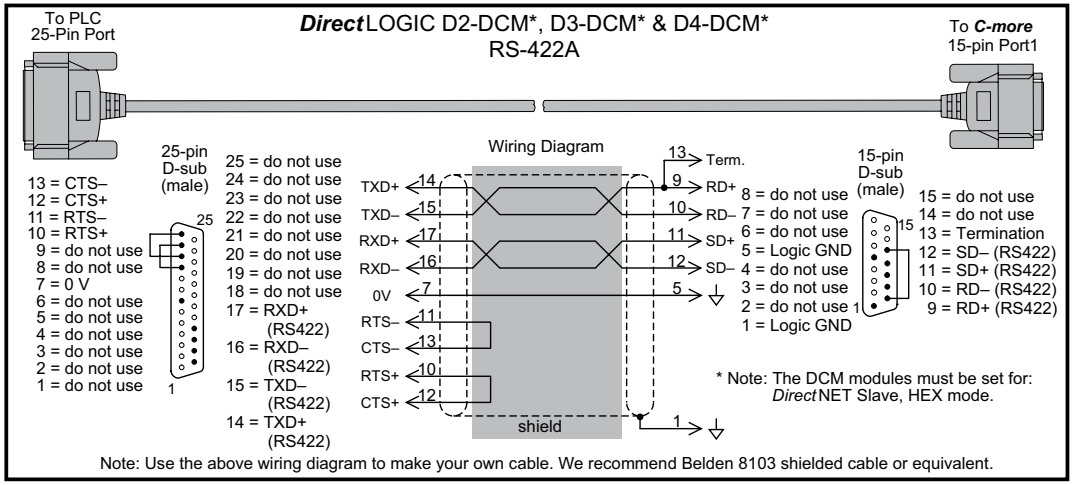
When using the RS-422A/RS-485A capabilities of the ***C-more*** 15-pin PLC communications Port1, the termination resistor is placed between the **RXD–** and **RXD+** terminals on the PLC side of the connection between the HMI and PLC. The Termination Resistor value is based on the characteristic impedance of the cable being used. To enable the built-in 120 Ohm Termination Resistor, jumper pin **13** to pin **9 (RXD+)** on the ***C-more*** 15-pin PLC communications Port1.

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

User Constructed

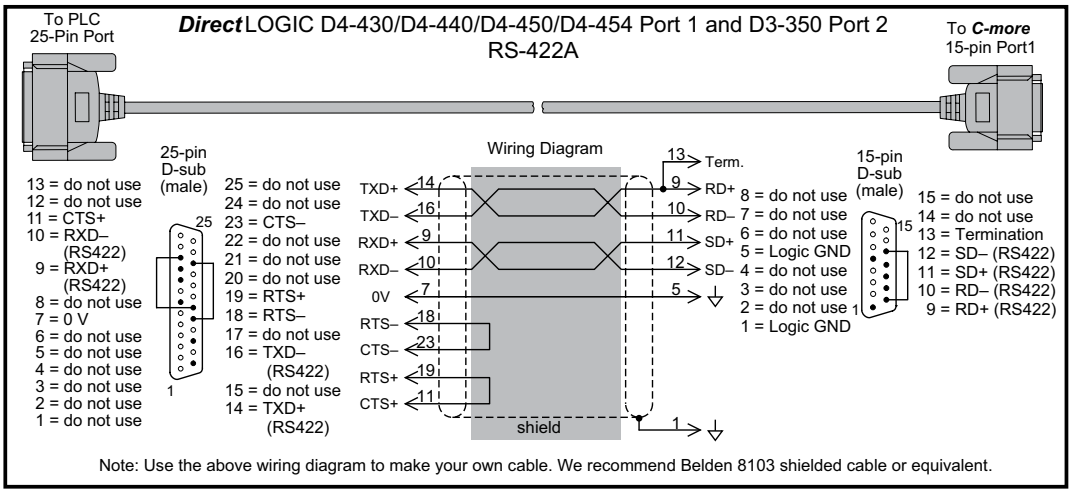


Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

NOTE: *The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

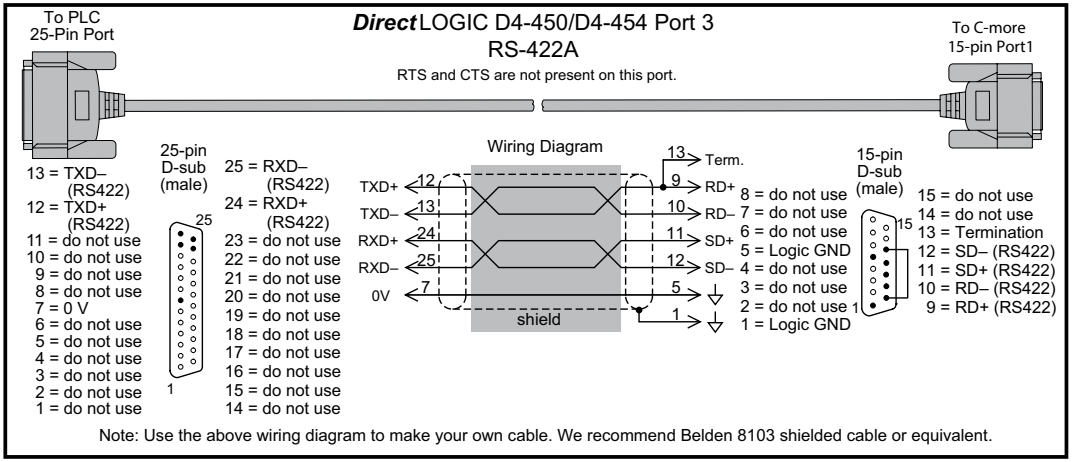
AutomationDirect PLCs RS-422A/RS-485A (cont'd)

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

User Constructed

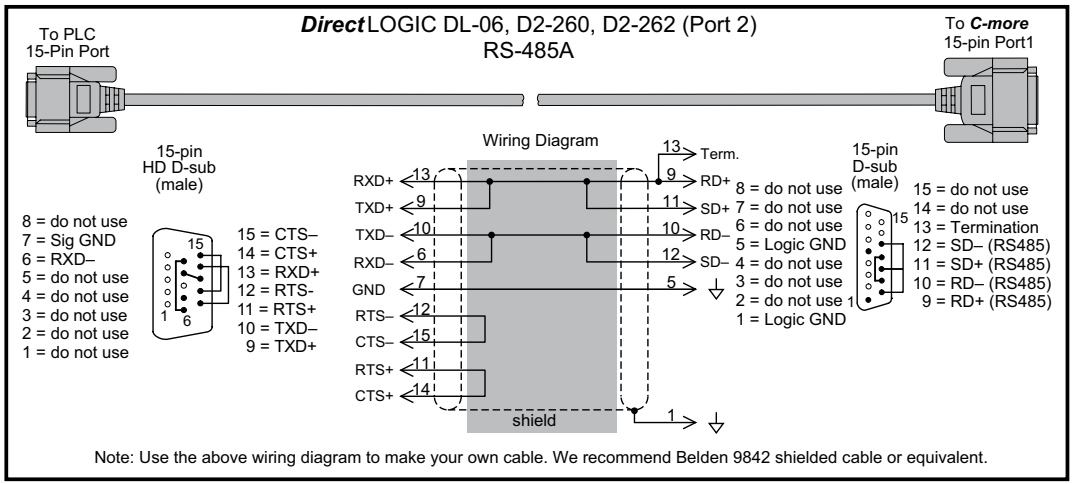


Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

NOTE: *The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

AutomationDirect PLCs RS-422A/RS-485A (cont'd)

User Constructed



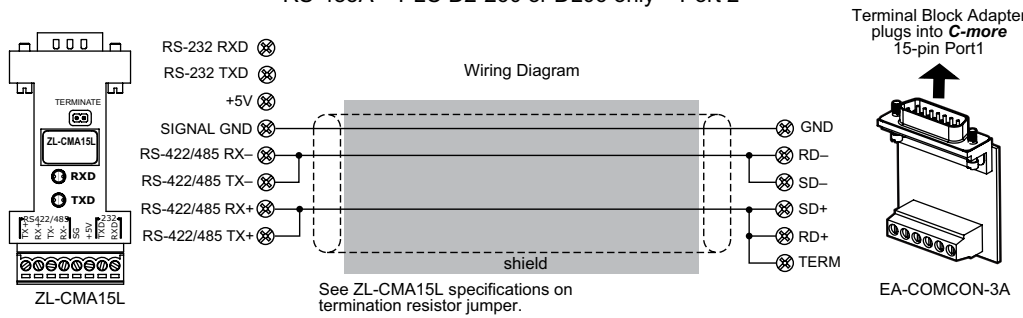
Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.

NOTE: *The RS-485 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

AutomationDirect PLCs RS-422A/RS-485A (cont'd)

User Constructed

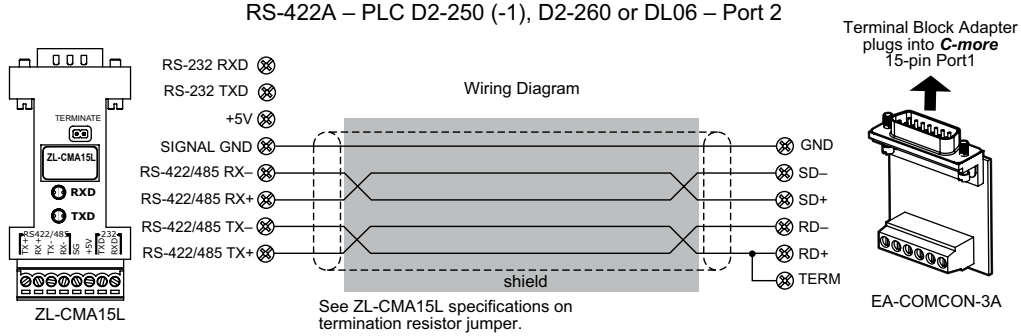
***Direct*LOGIC** ZIPLink ZL-CMA15L Adapter Module to EA-COMCON-3A Terminal Block Adapter
RS-485A – PLC D2-260 or DL06 only – Port 2



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

User Constructed

***Direct*LOGIC** ZIPLink ZL-CMA15L Adapter Module to EA-COMCON-3A Terminal Block Adapter
RS-422A – PLC D2-250 (-1), D2-260 or DL06 – Port 2



Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.

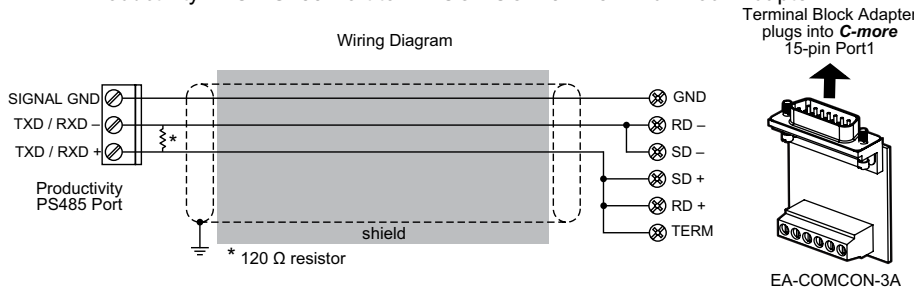
***NOTE:** The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

*** NOTE:** EA-COMCON-3 will install only on EA9-T6CL, EA9-T6CL-R, EA9-T7CL and EA9-T7CL-R panels*

AutomationDirect PLCs RS-422A/RS-485A (cont'd)

User Constructed

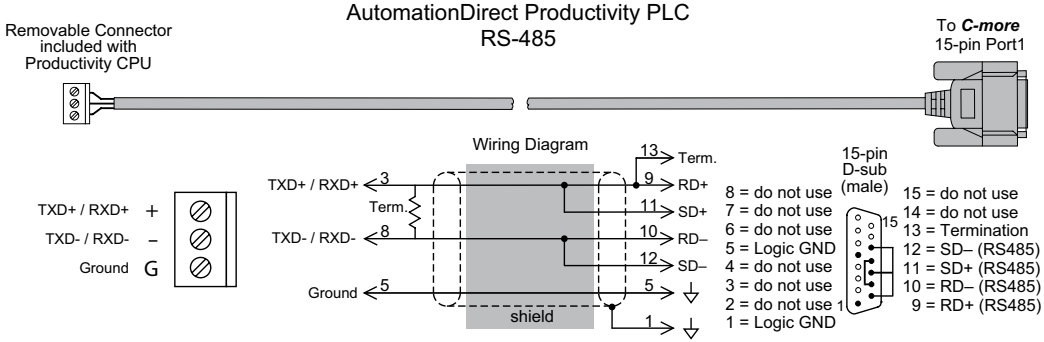
Productivity PLC RS485 Port to EA-COMCON-3A Terminal Block Adapter



Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.

User Constructed

AutomationDirect Productivity PLC
RS-485

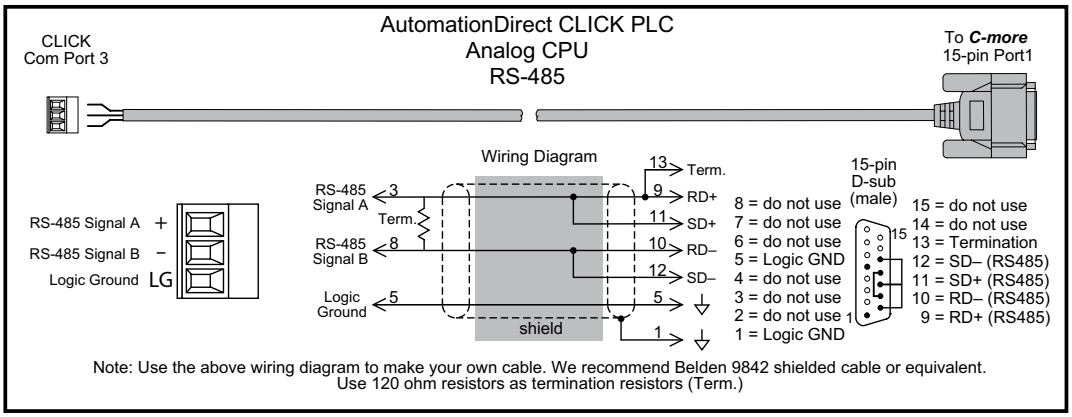


Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.
Use 120 ohm resistors as termination resistors (Term.)

NOTE: *The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

AutomationDirect PLCs RS-422A/RS-485A (cont'd)

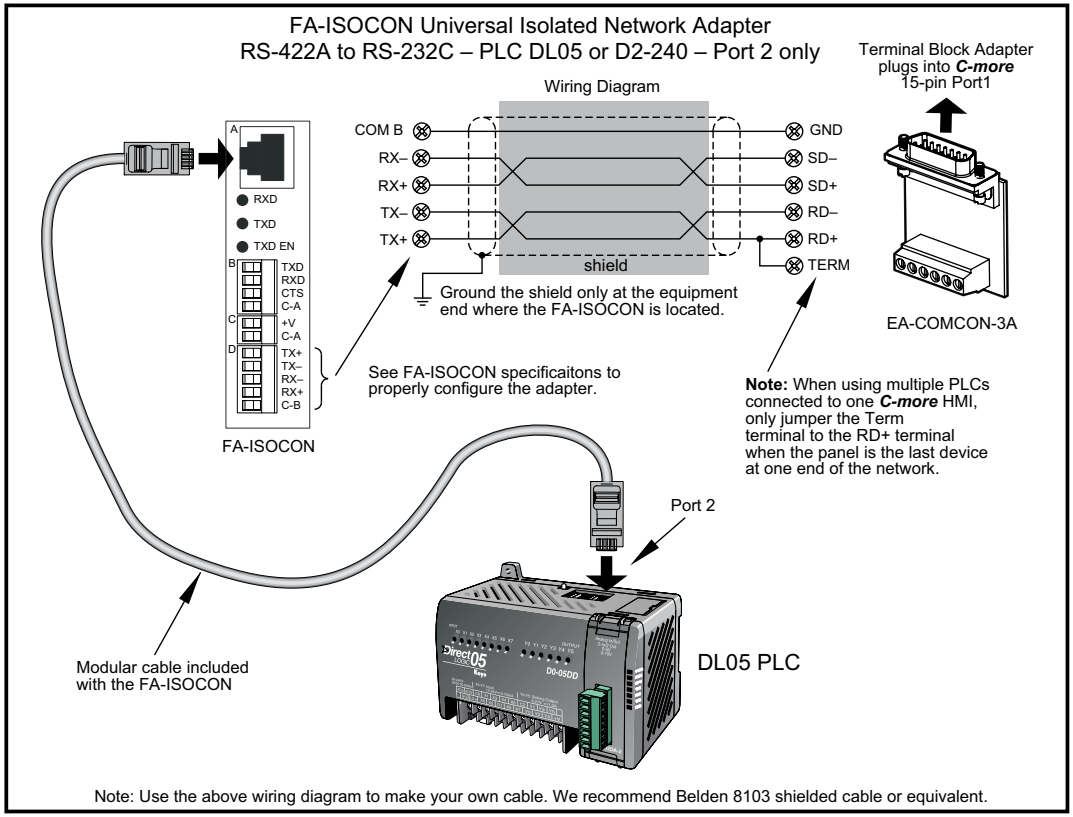
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.
Use 120 ohm resistors as termination resistors (Term.)

NOTE: *The RS-485 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to an HMI. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to an HMI.*

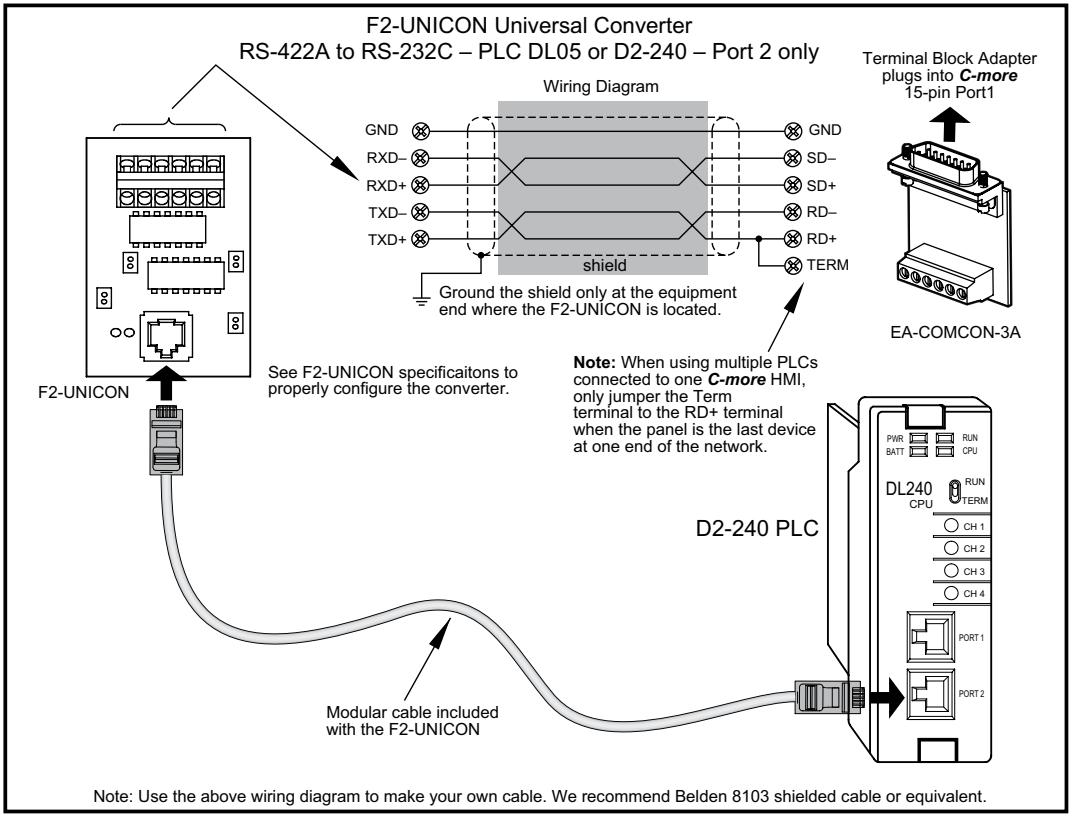
*Direct*LOGIC Universal Isolated Network Adapter, p/n FA-ISOCON:



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

*** NOTE:** *EA-COMCON-3 will install only on EA9-T6CL, EA9-T6CL-R, EA9-T7CL and EA9-T7CL-R panels*

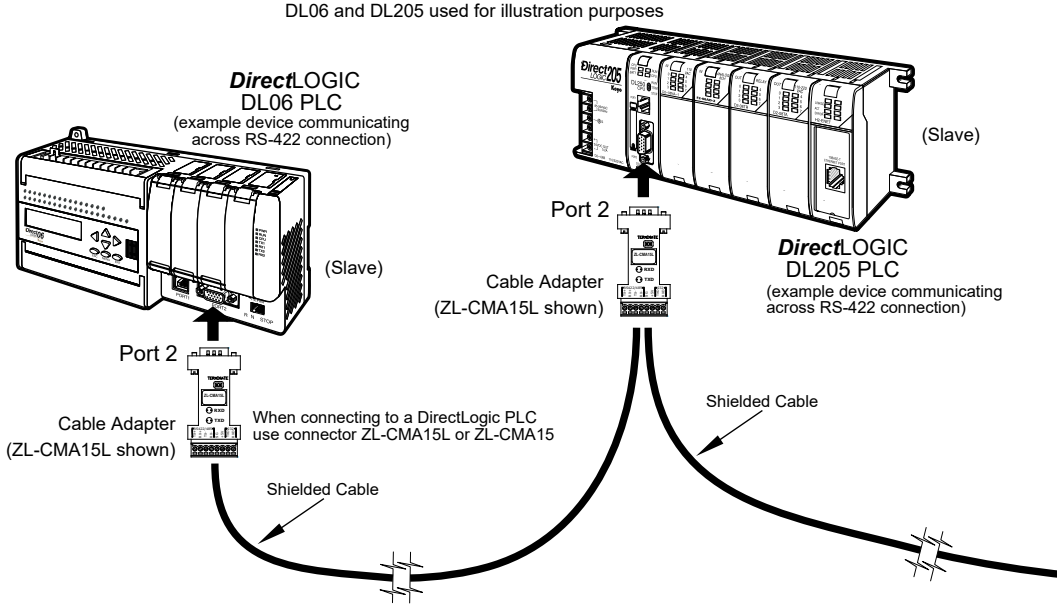
*Direct*LOGIC Universal Converter, p/n F2-UNICON:



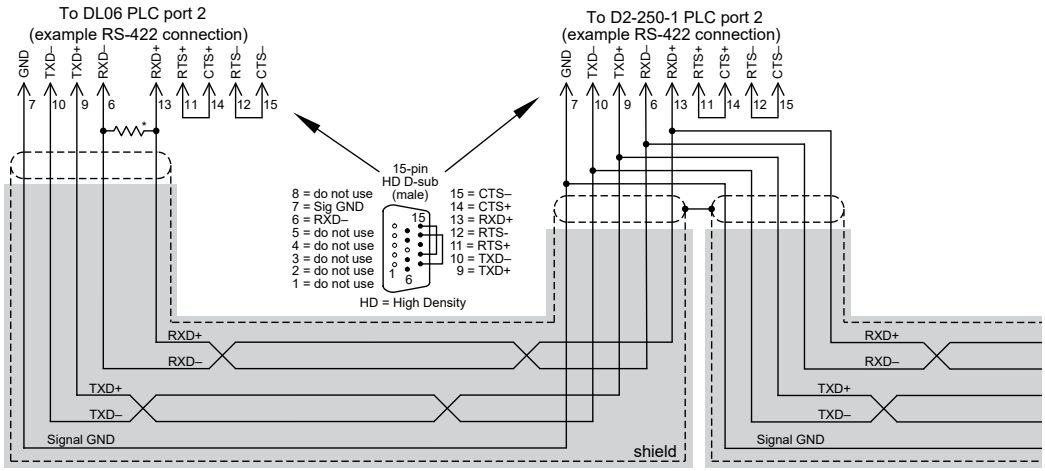
* ***NOTE:*** *EA-COMCON-3 will install only on EA9-T6CL, EA9-T6CL-R, EA9-T7CL and EA9-T7CL-R panels*

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples

DL06 and DL205 used for illustration purposes



Notes: 1. We recommend Belden 8103 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



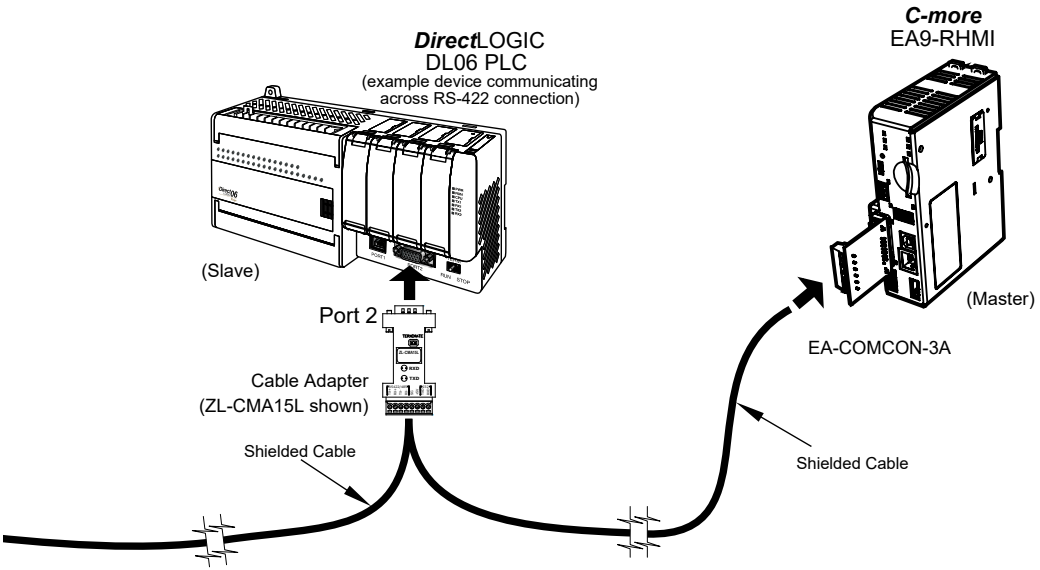
* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-422 Multi-Drop Wiring Diagram

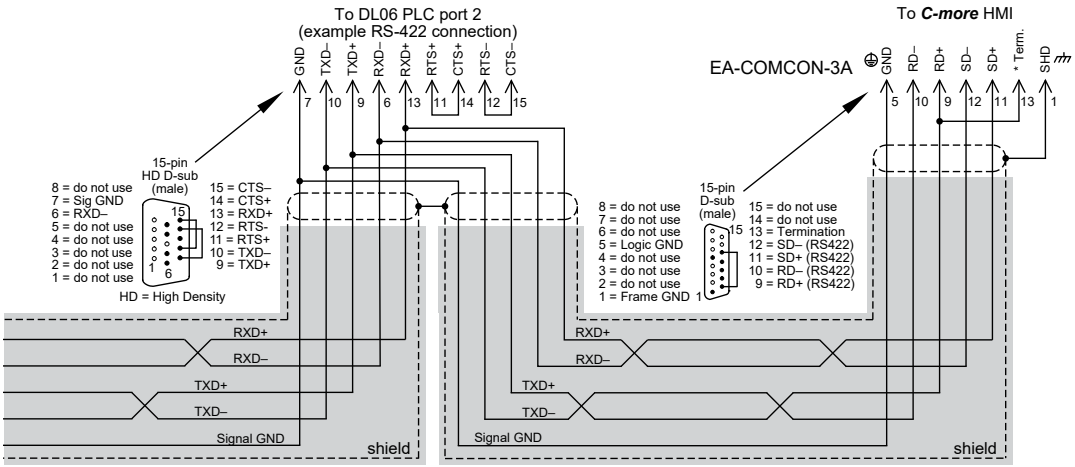
using DirectLogic pin numbers to illustrate

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)

DL06 and DL205 used for illustration purposes



Notes: 1. We recommend Belden 8103 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



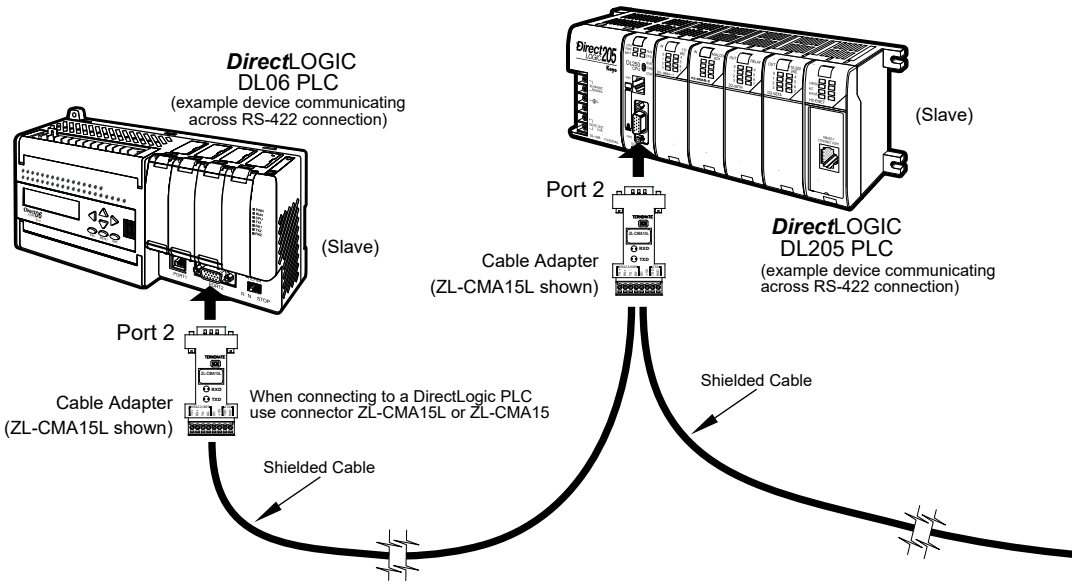
Typical RS-422 Multi-Drop Wiring Diagram (cont-d)

using DirectLogic pin numbers to illustrate

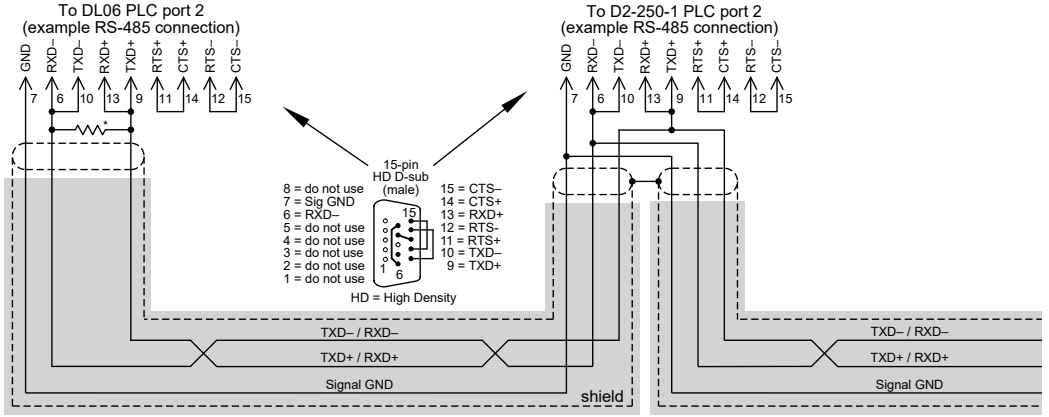
* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the ***C-more*** HMI 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)

DL06 and DL205 used for illustration purposes



Notes: 1. We recommend Belden 9842 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



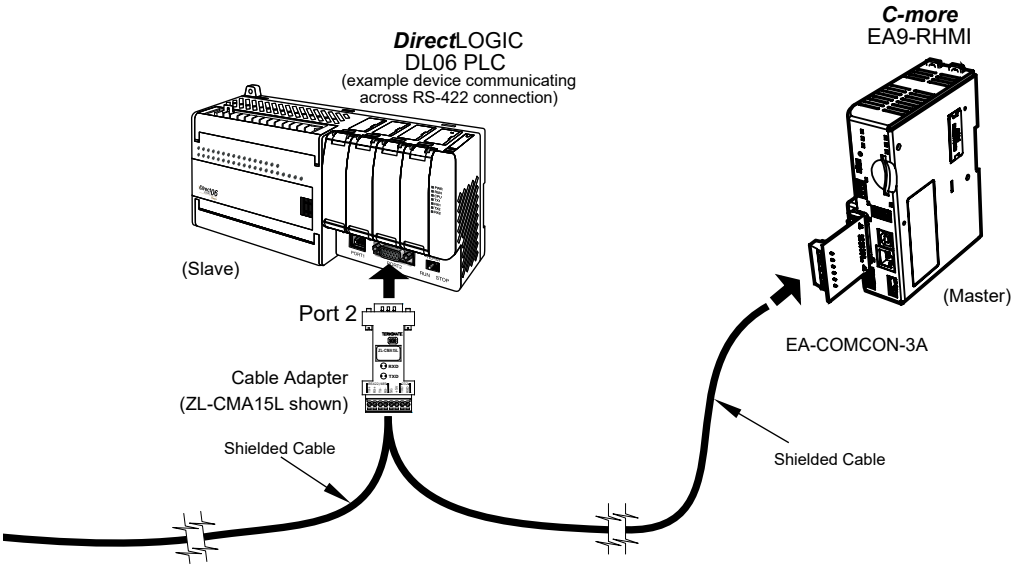
* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-485 Multi-Drop Wiring Diagram

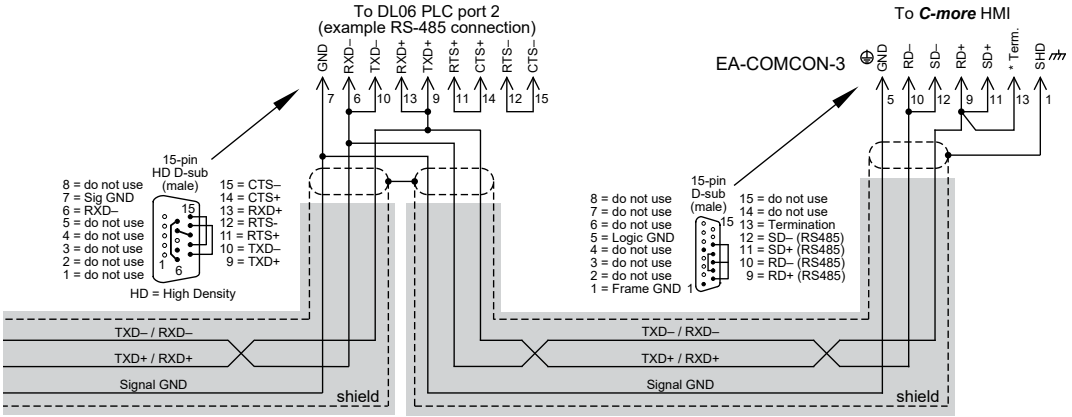
using DirectLogic pin numbers to illustrate

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)

DL06 and DL205 used for illustration purposes



Notes: 1. We recommend Belden 9842 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



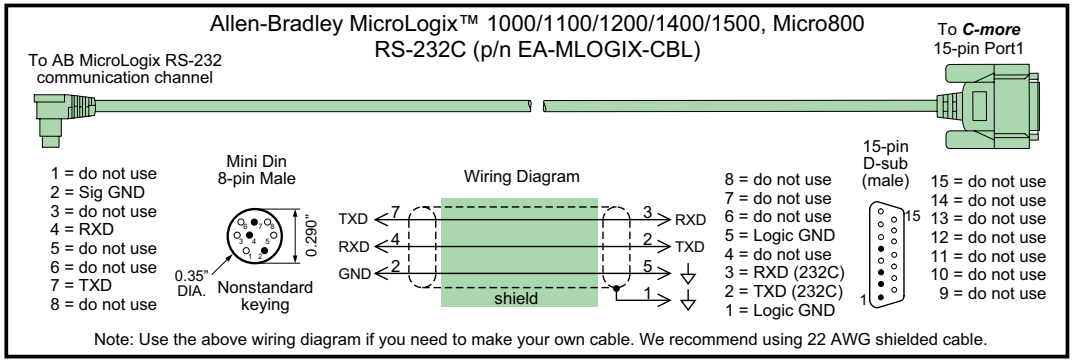
Typical RS-485 Multi-Drop Wiring Diagram (cont-d)

using DirectLogic pin numbers to illustrate

* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the ***C-more*** HMI 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

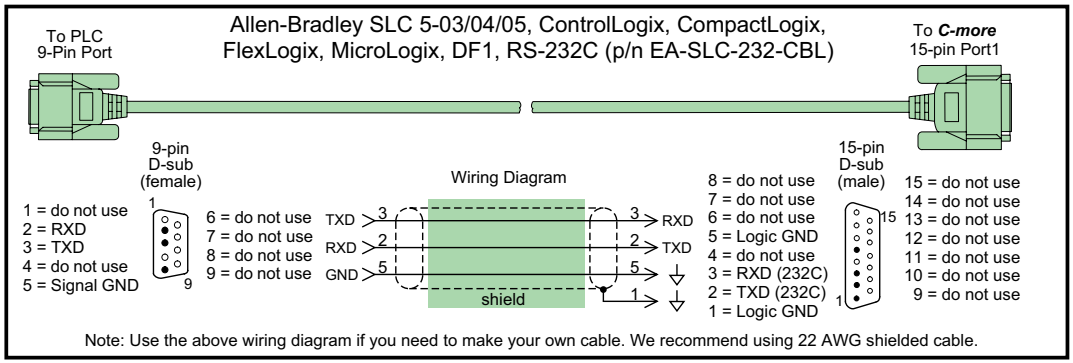
Allen-Bradley

EA-MLOGIX-CBL



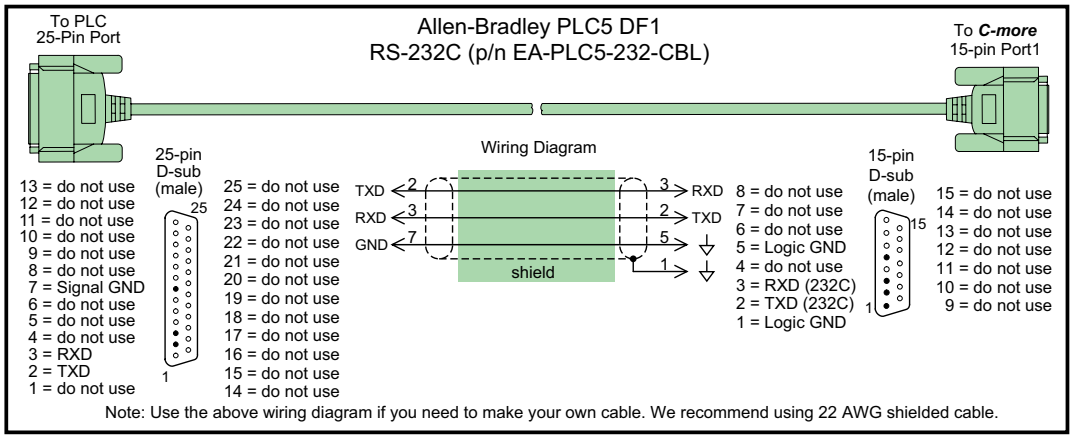
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

EA-SLC-232-CBL



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

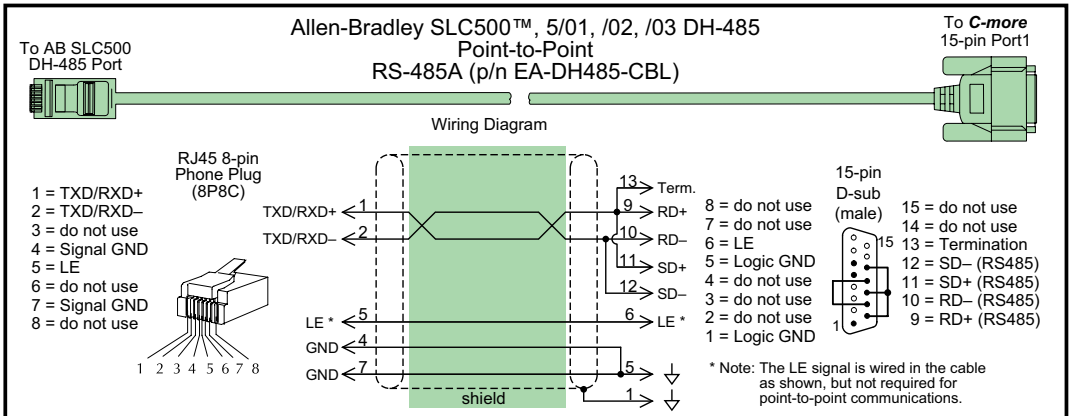
EA-PLC5-232-CBL



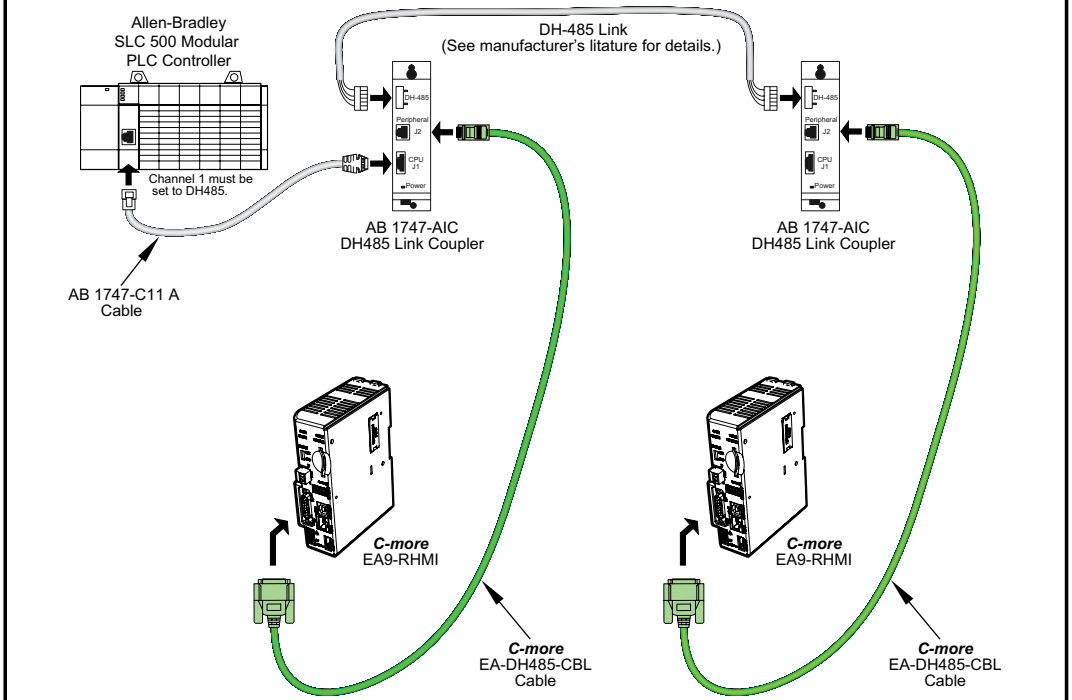
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

Allen-Bradley (cont'd)

EA-DH485-CBL



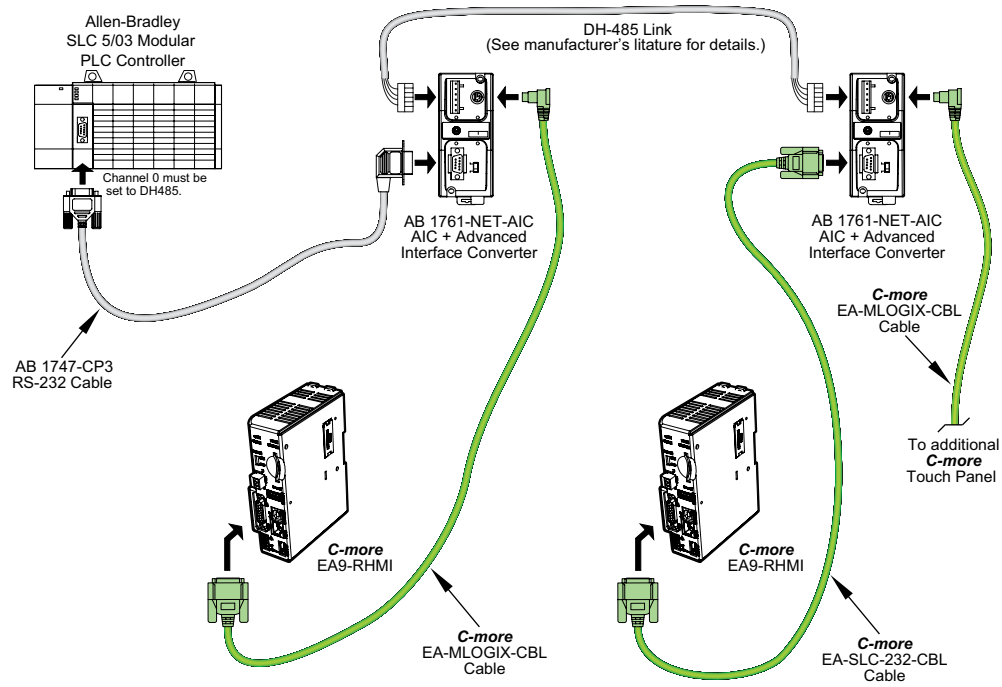
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 9842 shielded cable or equivalent.



Note: The above diagram shows connecting multiple ***C-more*** HMIs to an Allen-Bradley DH485/AIC network using the AB DH485 Link Coupler, p/n 1747-AIC. Select the "Allen-Bradly DH485/AIC SLC500 MircroLogix" driver in the ***C-more*** Programming Software when starting the project. Also, set the AB channel configuration for DH485.

Allen-Bradley (cont'd)

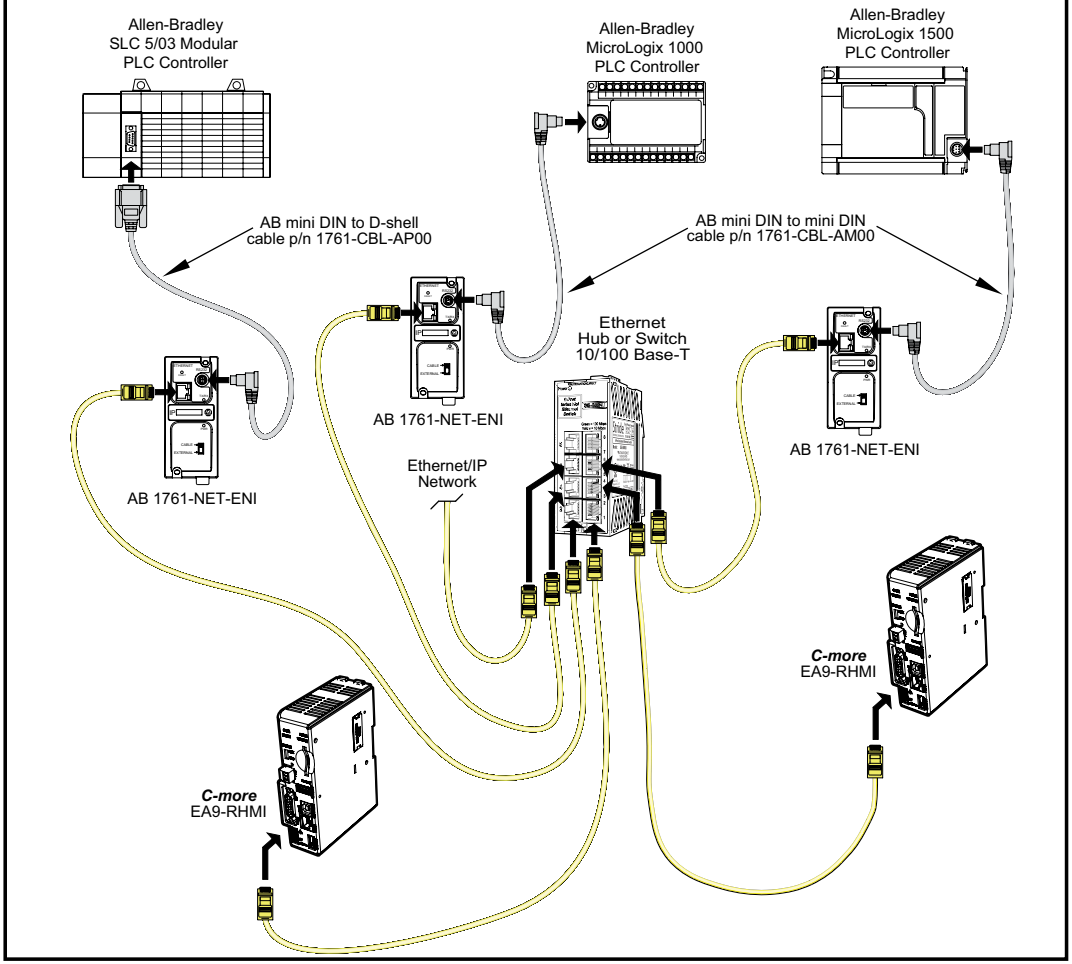
Allen-Bradley SLC500™ 5/03 DH-485/AIC to Multiple ***C-more*** EA9-RHMI
(using ***C-more*** cables p/n EA-MLOGIX-CBL, EA-SLC-232-CBL)



Note: The above diagram shows connecting multiple ***C-more*** touch HMIs to an Allen-Bradley DH485/AIC network using the AB AIC+ Advanced Interface Converter, p/n 1761-NET-AIC. Select the "Allen-Bradly DH485/AIC SLC500 MircroLogix" driver in the ***C-more*** Programming Software when starting the project. Also, set the AB channel configuration for DH485.

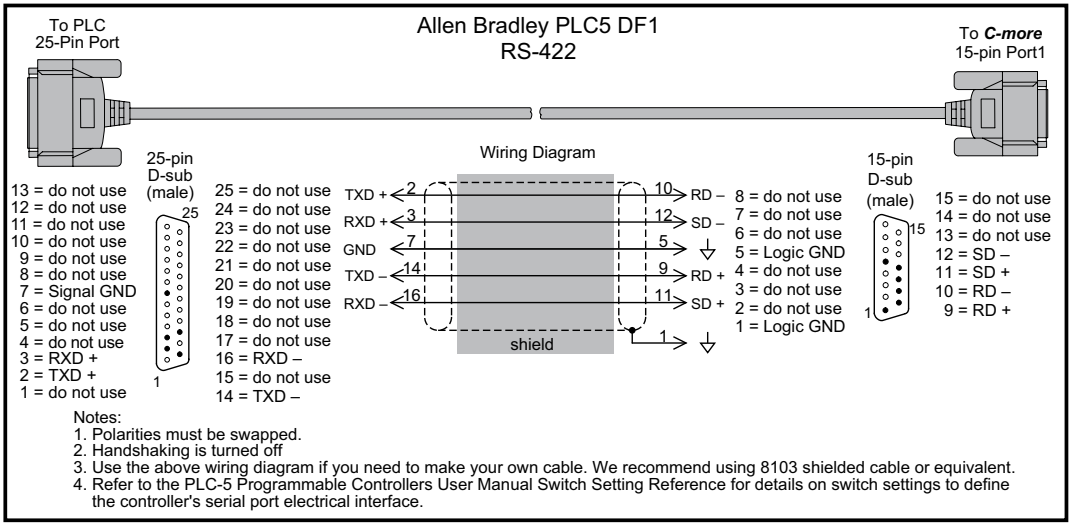
Allen-Bradley (cont'd)

Multiple Allen-Bradley PLCs connected to multiple ***C-more*** EA9-RHMI
(using AB Ethernet Network Interface p/n 761-NET-ENI with EtherNet/IP protocol)



Allen-Bradley (cont'd)

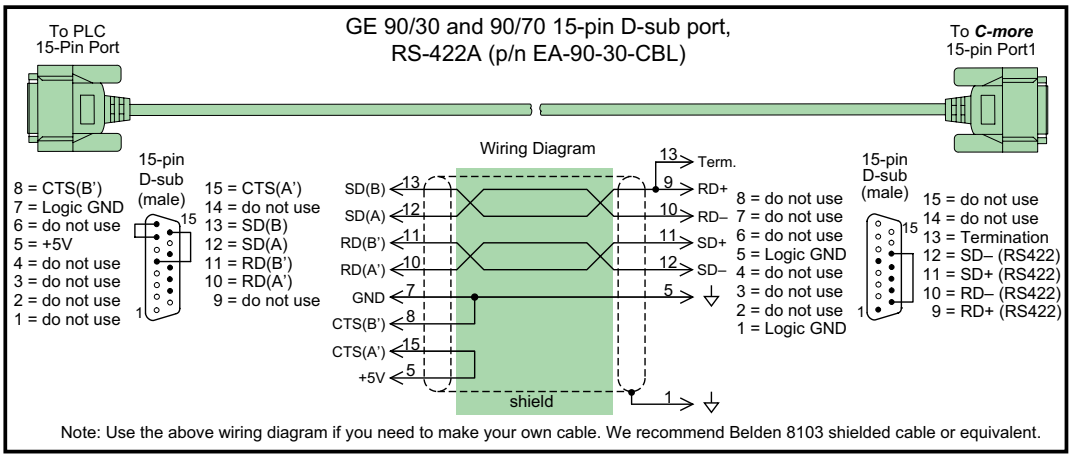
User Constructed



Notes:
1. Polarities must be swapped.
2. Handshaking is turned off
3. Use the above wiring diagram if you need to make your own cable. We recommend using 8103 shielded cable or equivalent.
4. Refer to the PLC-5 Programmable Controllers User Manual Switch Setting Reference for details on switch settings to define the controller's serial port electrical interface.

GE

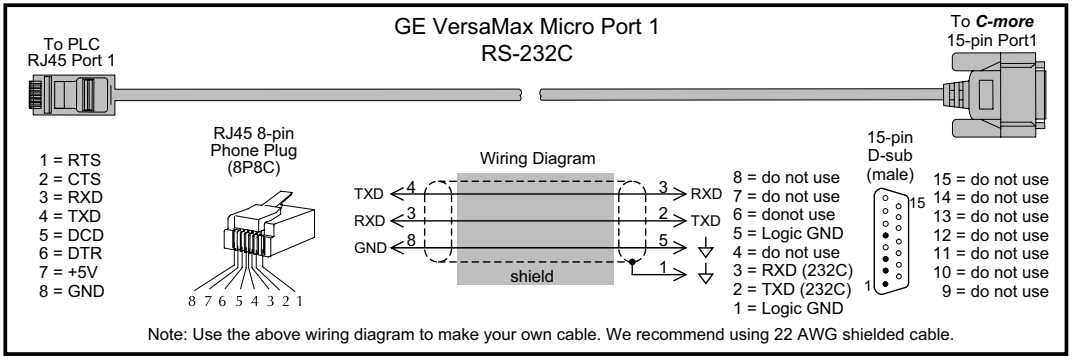
EA-90-30-CBL



Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

GE VersaMax Micro

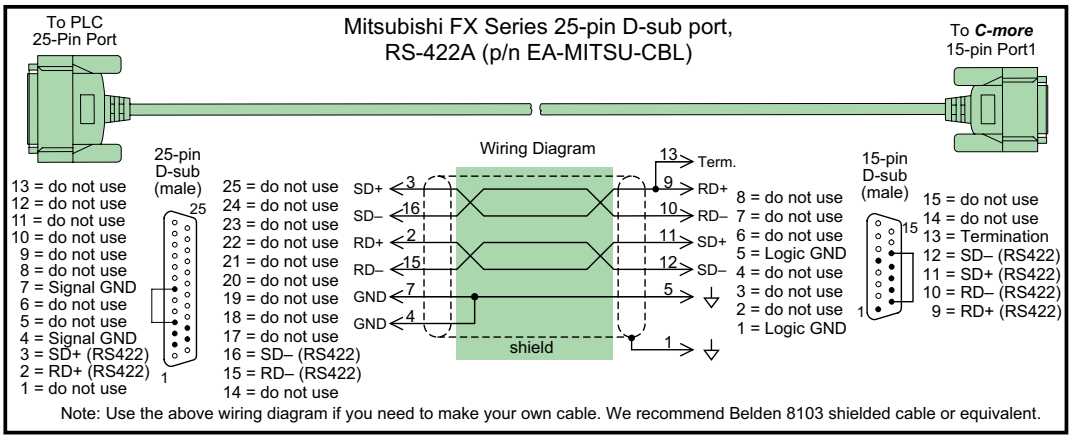
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

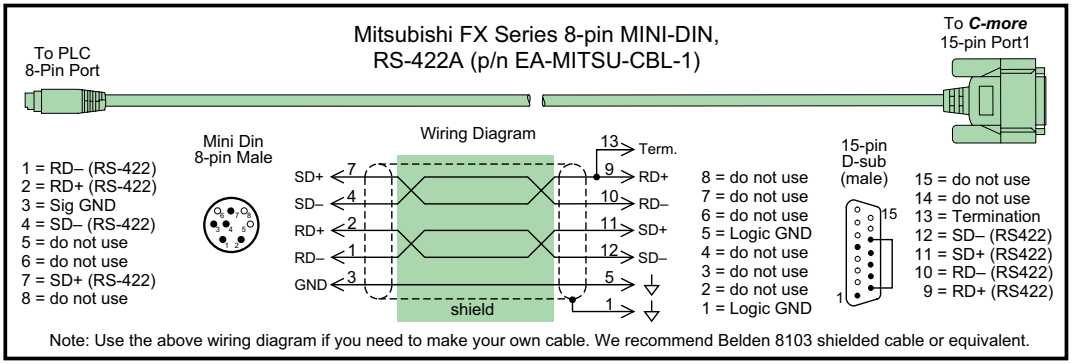
Mitsubishi

EA-MITSU-CBL



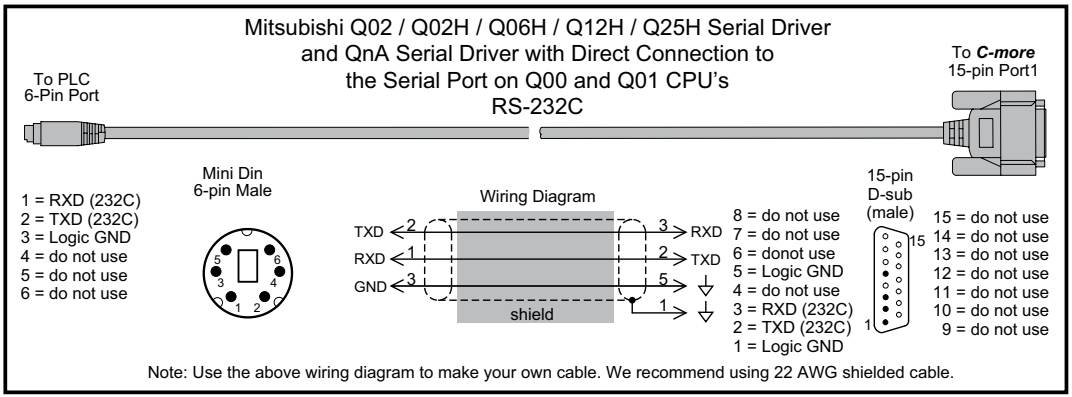
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

EA-MITSU-CBL-1



Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

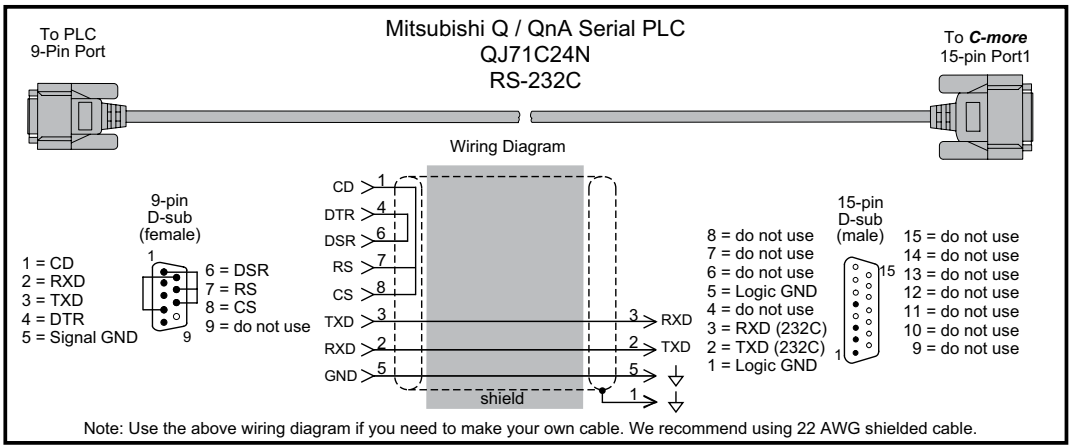
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Mitsubishi (cont'd)

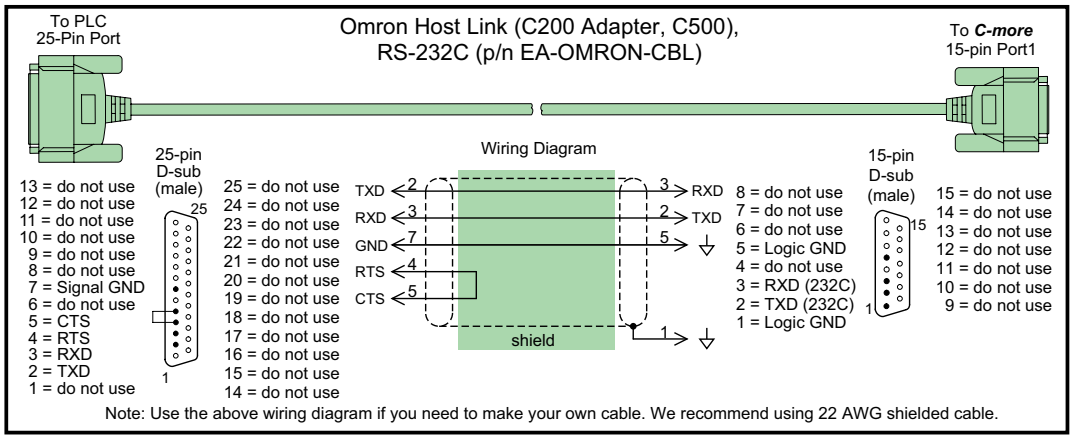
User Constructed



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

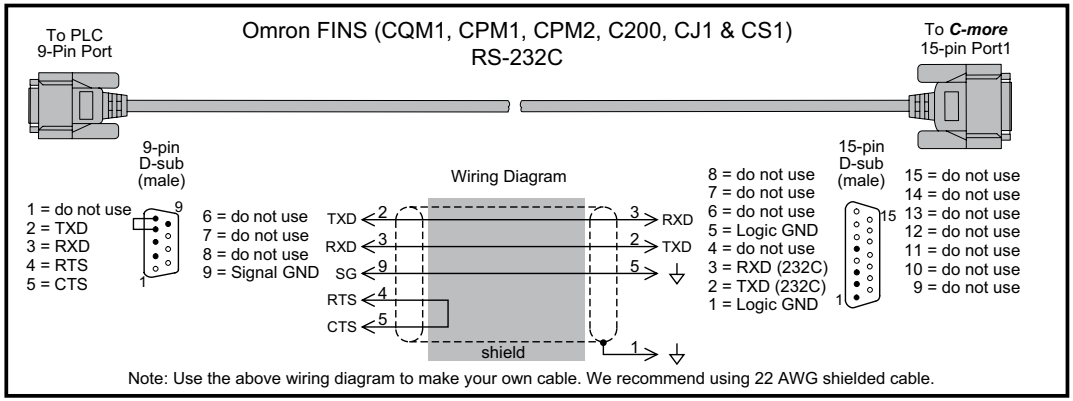
Omron

EA-OMRON-CBL



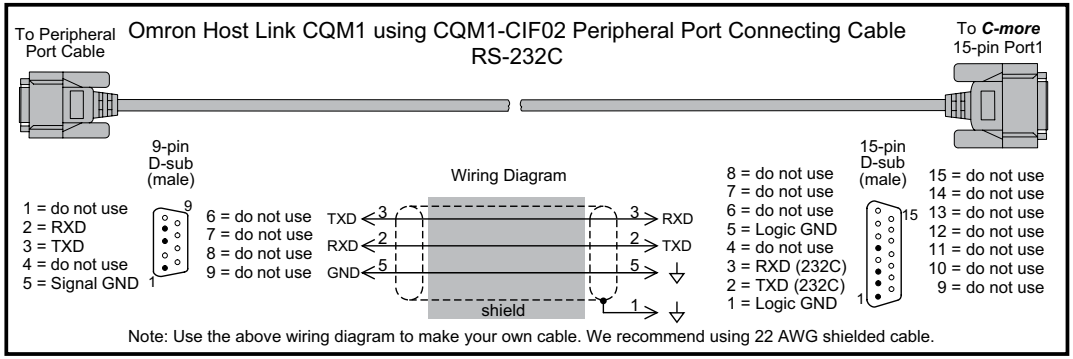
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

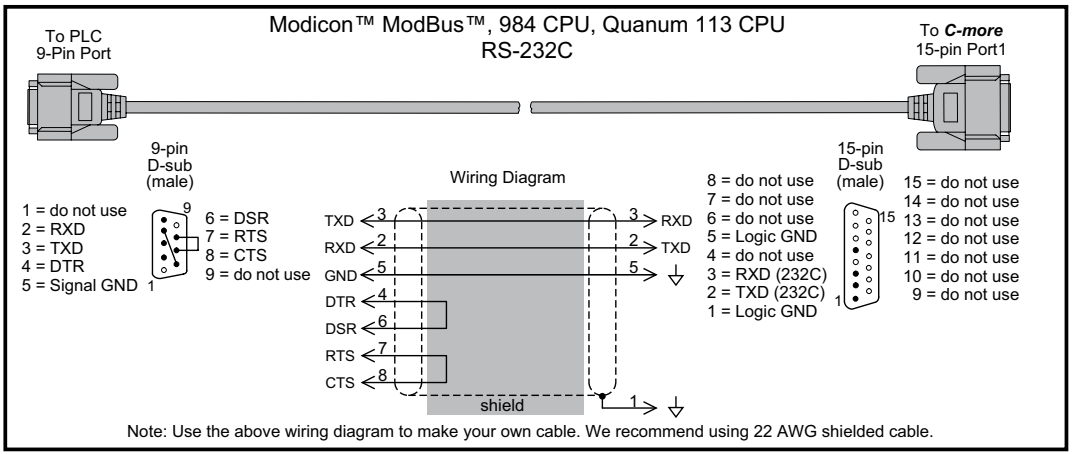
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon Modbus RS-232

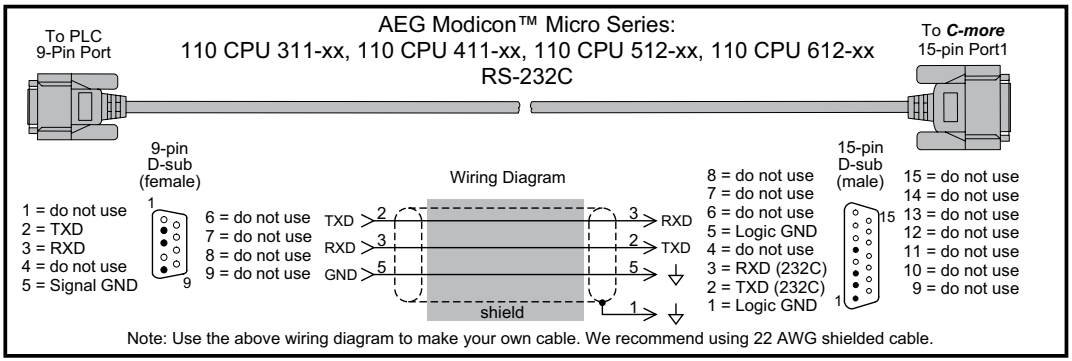
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon Micro Series

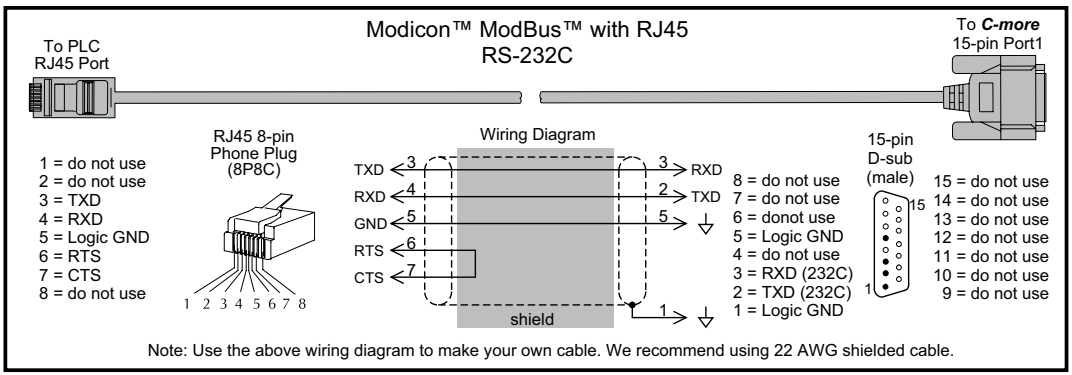
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon Modbus with RJ45

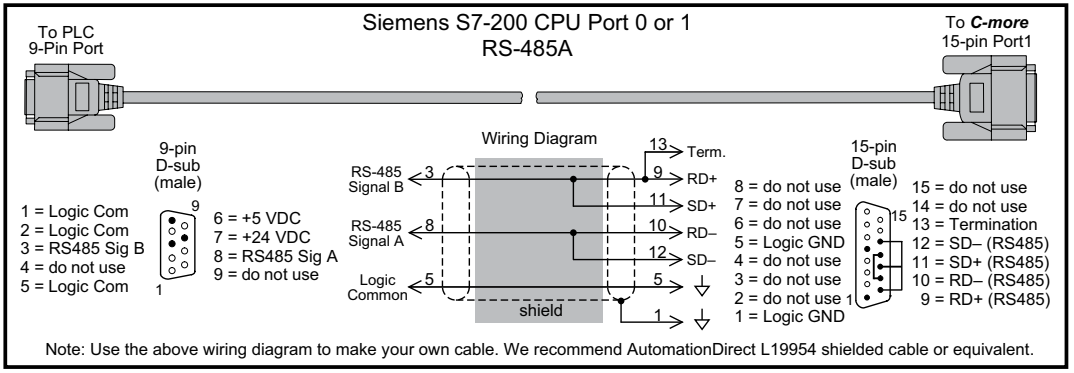
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Siemens

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend AutomationDirect L19954 shielded cable or equivalent.

MAINTENANCE

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Check Operating Voltage 7-2
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Check Physical Conditions 7-3
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Maintenance

Although the ***C-more*** HMIs require very little maintenance, setting up a routine maintenance schedule will ensure the longevity of the product in your application.

The following are some suggestions of items to include in a preventive maintenance list or schedule. Most of these items should be scheduled quarterly or semi-annually.

Project Backup

- During routine preventive maintenance is a good time to make sure that there is an up-to-date backup of the application project. Although the ***C-more*** HMI has the ability to upload the complete project from a panel through the programming software, insurance is warranted just in case the worse case scenario happens and the entire HMI is destroyed.

Check Operating Environment

- Make sure the HMI is operating in the proper temperature range: 0 to 50°C (32 to 122°F).
- Make sure the HMI is operating within the specified humidity range: (5-95% RH, non-condensing).
- Make sure the operating environment is free of corrosive gasses.

Check Operating Voltage

- Check the input voltage that is powering the HMI to make sure it is within the appropriate range.

DC: 12-24 VDC

Check Status Indicators

- During routine maintenance is a good time to take a quick look at the status indicators on the front of the HMI. The Power LED (PWR) indicator should be on, and there should be activity on the TxD and RxD LED indicators when connected serially to a PLC or control device. Check the status of the CPU LED and compare it to the chart shown in the illustration below. Any indication of the CPU LED other than a solid green shows there is a possible problem, and the condition needs to be corrected.

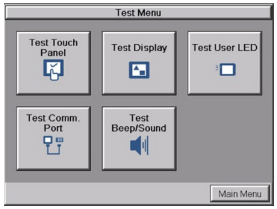
Refer to **Chapter 4 - Installation and Wiring**, ***C-more*** **LED Status Indicators** for more information.

Check Physical Conditions

- Check to make sure that none of the cooling vents around the HMI are clogged with dust or debris. Also make sure that there is clearance around the HMI as shown in **Chapter 4: Installation and Wiring.**

Run Tests under System Setup Screens

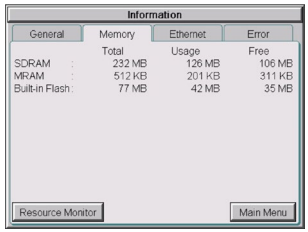
- Use the HMI's System Setup Screens to test the communication ports and beeper. See **Chapter 5: System Setup Screens** for additional details for the **Test Menu.**



Test Comm. Port - used to test the functionality of the 15-pin PLC communication serial port, the 3-wire terminal block RS-485 port, the RJ12 RS-232 port and the Ethernet port. A loop-back connector can be fabricated and used on the serial ports to test the RS-232 or RS-422/485 communications for the TxD and RxD signals and also the RTS and CTS signals if applicable. The **Test Comm. Port** setup screens and **Chapter 5** show pin-outs for the RS-232 and RS-422/485 loop-back connectors. The Ethernet connection can also be tested for communications if it is at least connected to an Ethernet switch. If the HMI is connected to a PLC, then an inquiry test can also be done to test the communications between the panel and the PLC. Press the Cancel button when finished to return to the **Test Menu** screen.

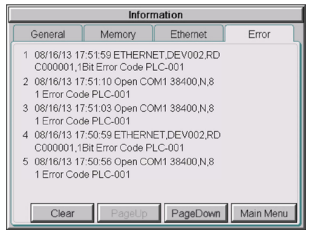
Check Memory Usage

- A good time to check and record the HMI's memory usage for future reference is during a routine maintenance schedule. The various memory devices being used by the panel are listed under the tab. This includes internal memory as well as any external memory device such as a USB pen drive or SD card memory. If no external memory device is inserted, none will show up on the list.



- The memory usage can be viewed by use of the panel's **System Setup Screen's Main Menu**, and then selecting the **Information** button then the **Memory** tab. See **Chapter 5: System Setup Screens** for additional details on using the **Memory** tab.

Check Error Log



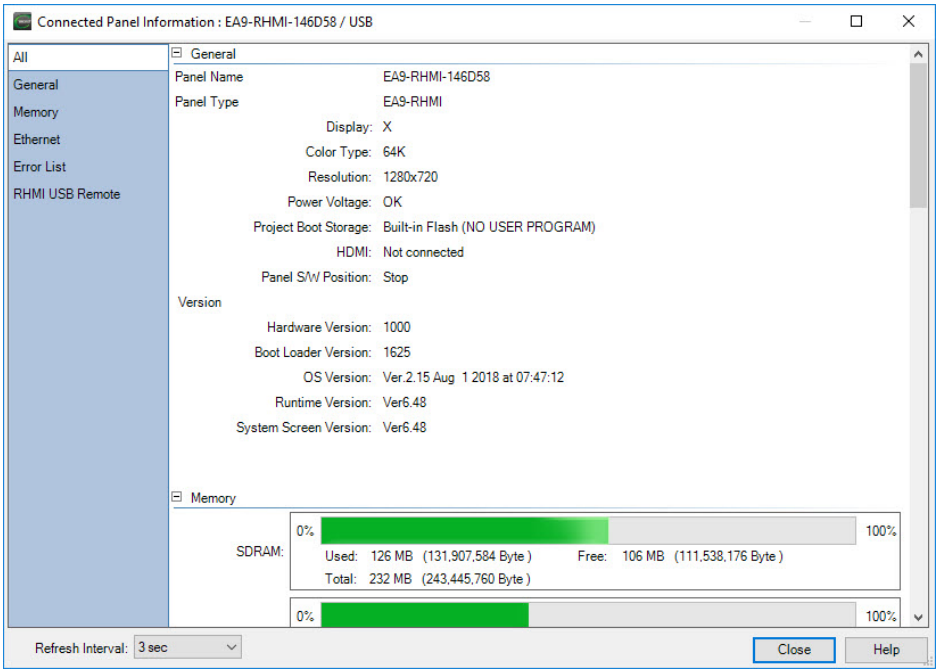
- Another good practice is to review the HMI's **Error Log**. The log can be viewed by use of the panel's **System Setup Screen's Main Menu**, and then selecting the **Information** button. Look under the **Error** tab. See **Chapter 5: System Setup Screens** for additional details on using the **Error** tab, **Appendix A: PLC Protocol Error Codes** for a list of the error codes as they relate to the specific PLC that is being used with a description of the error, and **Appendix B: HMI Runtime Errors** for a list of errors that may occur when the panel is in operation.

Check Project Functionality

- During routine maintenance is a good time to check the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application. As a starting point, you may want to run through all the screens to make sure they are accessible.
- If there are any trouble-shooting procedures built into the HMI application, now is a good time to also check these aids.

Checks from *C-more* Programming Software

- If you have a PC available with the ***C-more*** programming software, EA9-PGMSW, installed, and the PC is connected to the HMI, there are checks you can make to the status of the HMI by using the **Panel Information...** feature located under the **Main Menu** heading **Panel**. This includes the following:
  - Connected panel details
  - Memory availability and usage
  - Revisions



- Other functions that can be accessed from the programming software directly to the HMI include **DisplayScreen, Reboot, AdjustClock, MemoryClear,** and **Update Firmware**. Additional information concerning these functions can be found in the ***C-more*** programming software online help file.

Notes:

Troubleshooting

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The following topics are some of the more likely problems that may be encountered during the installation and operation of your ***C-more*** HMI. We have made some suggestions on what to check in order to correct the problem. Please start with the troubleshooting flow chart that covers the more common problems encountered by other users.

Common Problems

The troubleshooting flow chart shown on the following page is based on the more common problems fielded by our technical support team. Then, if you are having problems, please start with the flow chart and follow the suggestions listed. and if you still need help, call our tech support team @ 770-844-4200. In addition to having ready the information suggested in the flow chart, please have the following available:

1) ***C-more*** HMI part number including serial number with date code.

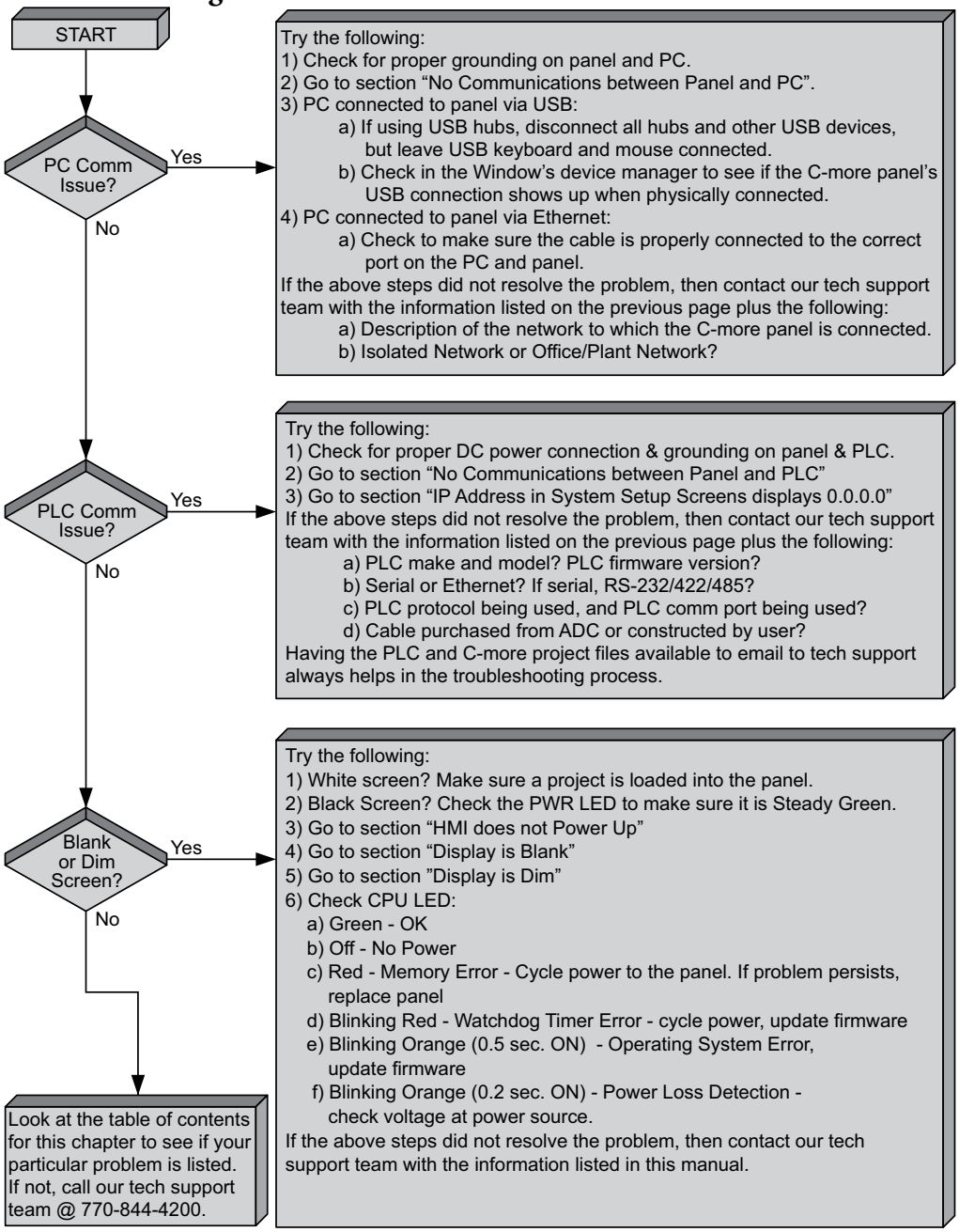
2) Programming software version that you are currently using. For example: Version 5.20. Having the software version number will allow our tech support team member to assess whether there are similar problems that have been reported when using the same version of the software. The programming software version can be found by clicking on **"About C-more Programming Software..."** selection under the **Help** pull down menu in the software. Also, it is always a good practice to visit the **Software/Firmware Downloads** area under the Tech Support section of the ***AutomationDirect*** website and check to see if you are using the latest version of the programming software. If you aren't using the latest software version, we suggest that you upgrade to see if this resolves your problem.

NOTE: *The **"About C-more Programming Software..."** dialog box will show a Firmware version. This is the current firmware version that is included with the programming software and does not reflect what firmware is actually loaded on your **C-more** HMI. See the following for details on how to check the firmware version.*

3) Firmware version of the ***C-more*** HMI. For example: V5.20. The firmware version can be checked by using the **System Setup Screens**, going to the **Information** menu under the **Main Menu**, and looking under the **General** tab for **Firmware: -Runtime**. The firmware version can also be checked by using the programming software, while connected to the panel, and clicking on the **Panel Information** selection under the Panel pulldown menu. As with the programming software version, it is important for our tech support associates to know which firmware version you are using so they can check on any known problems. As with the programming software, we strongly suggest that the firmware be updated to the latest version. Check for the latest version and download from the **Software/Firmware Downloads** area of the ***AutomationDirect*** website.

It is also helpful to have a copy of your project file for our tech support associates to use in troubleshooting a problem, so please be prepared to forward a copy of your project if it is requested.

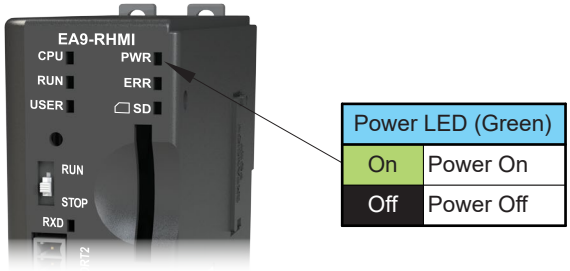
Troubleshooting Flow Chart



HMI Does Not Power Up

1.) Check the status indicators on the front of the panel to see if the **Power LED (Green)** indicator is on. Refer to the diagram below. If the **Power LED (Green)** indicator is on and the panel was observed showing "Initializing..." during power up, but the display is now blank, go to the next troubleshooting tip, **Display is Blank.**

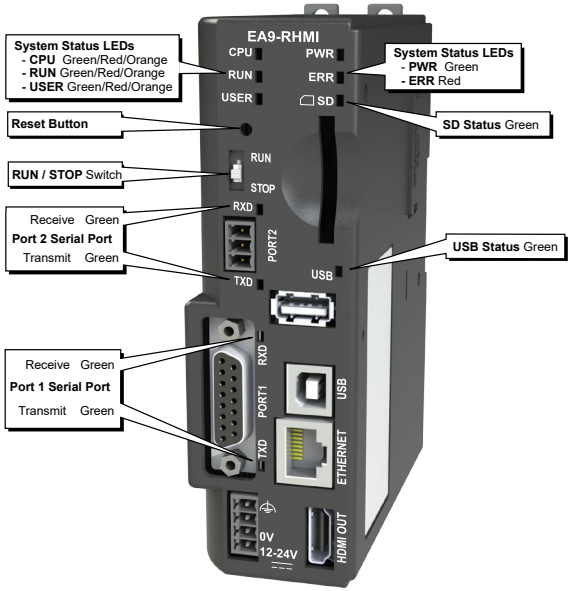
2.) If the **Power LED (Green)** indicator is off and the panel is being powered with a 12 or 24VDC power source, use a voltmeter to check the incoming DC voltage level. If the incoming DC voltage is zero, check any fusing that may be in the circuit. If the fuse is open, determine cause and replace. If the DC voltage level is out of range, the DC power source needs to be corrected or replaced.



C-more LED Status Indicators

The status indicators will show activity whether the serial communications is wired for RS-232 or RS-422/485.

Electrical noise, pulse generating wiring and/or improper grounding can also cause problems with communications. Refer to the **Electrical Noise Problems** section later in this chapter for additional help.



System Status LEDs				
	LED / State	CPU	RUN	ERR
Status	Loading OS	Blinking Green (0.5s)	OFF	OFF
	CPU Running Normal	Green	–	OFF
	Project Loaded and Running	–	Green	–
	No User Project	–	Orange	–
	Password Required	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Errors	Power Loss Detection	Blinking Orange (0.2s)	–	–
	Memory Error	Red	OFF	Red
	OS Error	Blinking Orange (0.5s)	OFF	Red
	Watch Dog Time Out	Blinking Red (0.5s)	–	Red
	No Log Storage Found	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
	General Error*	–	Red (0.5s)	Blinking Red (0.5s)
	Warning*	–	Blinking Orange (0.5s)	Blinking Red (0.5s)
Mode	Recovery Mode	Blinking Orange (0.5s)	OFF	OFF
	Safe Mode	Orange	OFF	Red

**Note - See Chapter 8 - Troubleshooting for General Error and Warning explanations.*

General Errors and Warnings

There are multiple causes for general errors and warnings. To get specific information for a general error and warning, connect the EA9-RHMI to a PC via USB. See Chapter 5 - System Setup Screens, Using RHMI USB Remote for more information.

General Errors

- This file is not in a recognizable format
- Unsupported file version
- Not enough buffer memory
- Not enough memory to show all data points for trends
- Error in reading the file
- Multiple projects found in panel

Warnings

- MRAM memory check sum error
- ***C-more*** runtime has detected corrupt data
- RUN --> STOP w/ Password
- Boot in STOP w/ Password
- No log storage found. *Note* - Data will not be logged if 'Ignore' is pressed.
- **WARNING** - The panel will stop
- Memory device is write protected

EA9-RHMI Beep

Beep Functions	
Function	***Beep Pattern***
Boot	1-long, 2-short
Boot Error*	3-long
HDMI Connected	3-short
Reset to Factory Defaults	14 short beeps progressively closer together followed by 1-long beep.
Blink Screen	5-long

Boot Errors

Multiple Projects
Write Protected SD Card
System Screen (RUN/STOP switch in STOP position)
Password Protected

Display is Blank

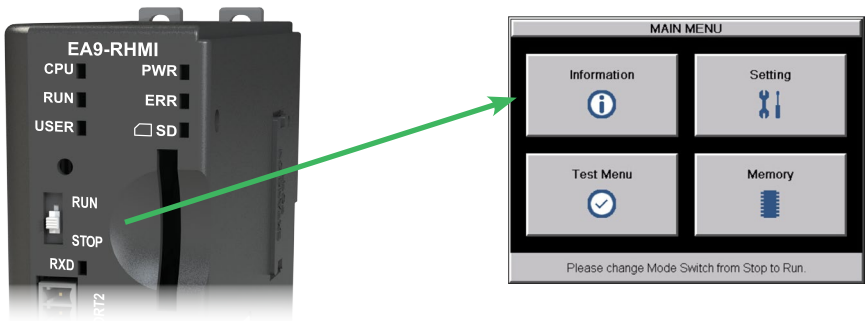
1.) Touch the screen to make sure the panel is not in the **Screen Saver** mode.

- The **Screen Saver** will be turned off and the panel screen will display:
  - If a **PLC Address** is configured to control the **Screen Saver** and changes from **On** to **Off.**
  - When a connected touchscreen panel is touched.
  - When the screen is clicked by **Remote Access.**
  - When the **Alarm Event** of the **Event Manager** occurs. (Only when the **Display** setting of the **Alarm Event** is checked).
  - When there is a screen change by the **PLC**.
  - When an **Error** such as a **Communication Error** occurs.

2.) If the panel is not in **Screen Saver** mode, check the LED status indicators on the front of the unit. Refer to **Chapter 4 - Installation and Wiring**, ***C-more*** **LED Status Indicators** for more information.

- Make sure the **CPU** status **LED (Green, Orange, Red)** is a **steady Green**.
- If the **CPU** status **LED** is **blinking Orange (ON for 0.2 sec)**, then the supply voltage is below 12VDC
- A **blinking Orange CPU (ON for 0.5 sec)** status LED indicates that the operating system could not be found. Reload the firmware to the HMI. If this does not resolve the problem, the panel must be replaced.

3.) There is always the remote possibility that a project has been transferred to the HMI that includes a screen that uses a black background and has no objects placed on the screen. To check for this possibility, access the **Main Menu** of the HMI **System Setup Screens** by moving the RUN / STOP switch to the STOP position. If the **System Setup Screen's Main Menu** is displayed, then most likely an empty black background screen is being displayed.



No User Program

If a connected display is displaying the message “No User Program” after it has powered up, then either:

– the built-in Flash memory does not contain a recognized project, or

– an SD memory card is plugged into the SD1 slot, the project is set to boot from SD1 and there is no project on the SD memory card. Turn the power off, remove the SD memory card and turn the power back on.

Keep in mind that on power up, the HMI will read the project into the SDRAM memory from the location designated in the **Project Storage/Boot Location** setting in the in the ***C-more*** Software. This will either be the Built-in Flash memory or an SD memory card in the SD1 slot. If the location designated has no project, the upon power up or reboot NO USER PROGRAM will be displayed even if a project resides in the other location.

Touch Screen Does Not Work

Make sure you're using a monitor with a compatible touch screen.

The ***C-more*** EA9-RHMI supports both ELO Resistive and SAW touch screens and EETI eGalax Resistive touch screens starting with firmware version 6.53. EETI eGalax single-touch pCap touch screens are supported with firmware version 6.70.

NOTE: *Check with the monitor manufacturer to make sure the monitor you purchase uses one of the drivers listed below.*

Capactive, single or multi-touch touch screens are not supported

The manufacturers and models that have been tested at the time of firmware version 6.70 release are:

EA9-RHMI Compatible Touch Screen Monitors				
Manufacturer / Distributor	**Models**	**Driver**	**Minimum Firmware Version**	**Support Website**
AutomationDirect	Atlas	ELO	6.53	https://automationdirect.com
Hope Industrial Systems	All Resistive Touch Screen Models	ELO	6.53	https://www.hopeindustrial.com
ELO	All Resistive and SAW Touch Screen Models	ELO	6.53	https://www.elotouch.com
Advantech	IDS-3215R-40XGA1E Touch Screen Monitor	eGalax - Resistive	6.53	https://www.advantech.com
Tru-Vu	VMTR-15C-24 Touch Screen Monitor	eGalax - Resistive	6.53	https://tru-vumonitors.com
Dynics	FX15PTUMAD Touch Screen	eGalax - Resistive	6.53	https://www.dynics.com
Tru-Vu	ZBMT-18.5-R	eGalax - pCap	6.70	https://tru-vumonitors.com
Advantech	FPM-221W-P4AE	eGalax - pCap	6.70	https://www.advantech.com

Touch Screen Calibration is Inverted

If the cursor moves to the opposite side of a connected touch screen when it is touched, the touch screen will need to be calibrated using a USB mouse. Follow these steps for proper calibration.

1.) Move the EA9-RHMI RUN/STOP switch to STOP to access the System Screen.

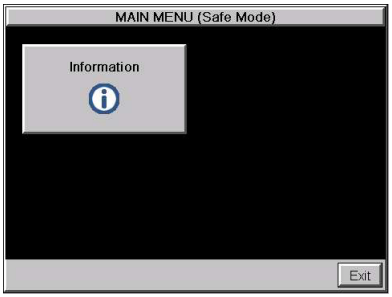
2.) Connect a USB mouse to the USB port on the EA9-RHMI. The cursor should follow the mouse movement.

3.) Use the mouse to access the Calibration screen. From the Main Menu select Settings, Adust Touch Panel and Start Calibration.

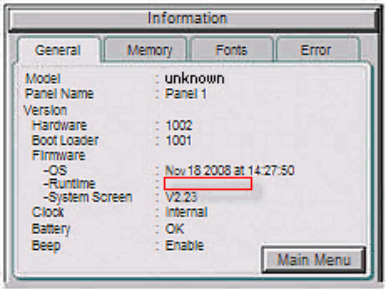
4.) From the Calibration screen, use your finger, not the mouse to touch each calibration crosshair as they appear. Once all three points are touched, select Accept, Redo or Cancel.

Firmware Recovery Tool

If the panel power is interrupted during a firmware update, the firmware and/or operating system in the panel may become corrupt. The panel may be recoverable using a recovery utility that installs when the ***C-more*** Programming Software is installed. If the firmware is corrupt, but the operating system is still intact, the CPU Status LED will be Orange and the Error Status LED will be Red. If a monitor is connected, the screen below will open when power is reapplied to the panel. This is called Safe Mode



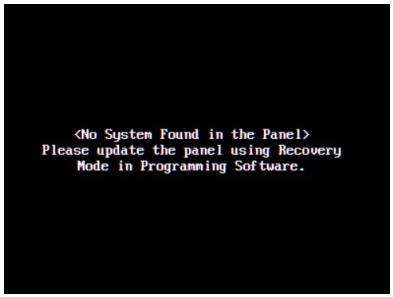
Press the Information button and the Information Screen shown below will display. Notice that the runtime version is blank.



To recover, start the firmware update again making sure that there is a constant clean power supply.

No System Found

If the operating system is corrupt, the CPU status LED will blink 0.5 seconds on and 0.5 seconds off. The RUN and ERR status LEDs will be off. A connected screen will display **No System Found**.

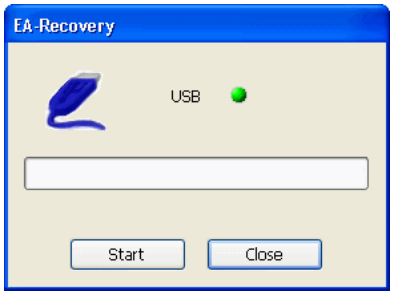


To recover the panel's Operating System:

1. Connect the Panel to your PC with the USB programming cable. (Any standard USB printer cable will also work.)
2. Close the ***C-more*** Programming Software.
3. Cycle the power on the panel.
4. From the Windows Start Menu select:

   Start Menu > AutomationDirect > ***C-more*** EA9 Series Recovery Tool

The window shown below will open.



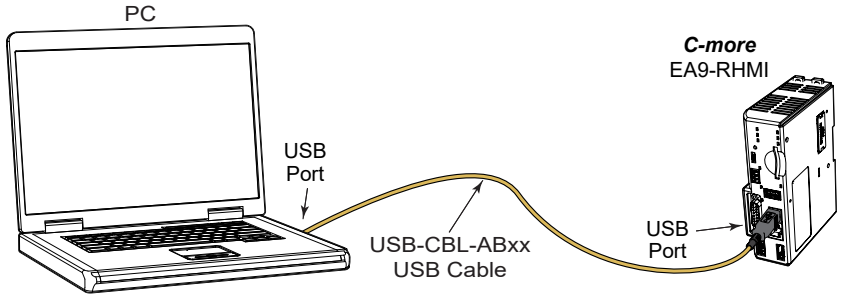
NOTE: *If the USB Icon is blinking and the USB light is Red, this indicates that there is a communication problem to the panel. Check that the USB cable is properly connected and make sure there is communication to the panel.*

5. Select Start and the Operating System will be loaded to the panel.

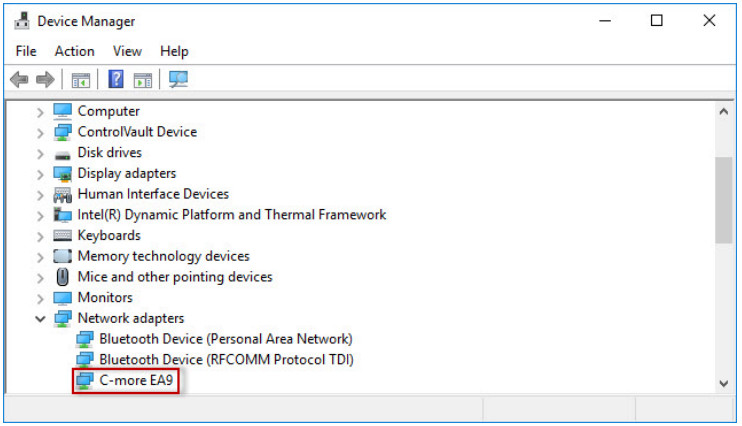
No Communications Between Panel and PC (Personal Computer) via USB

The ***C-more*** HMI is programmed using the ***C-more*** Programming Software, EA9-PGMSW. The developed project is transferred from the PC to the HMI by either a USB or an Ethernet connection between the two. (Ethernet available on full feature units only.)

If using USB, then a USB type AB programming cable, such as p/n USB-CBL-AB15, should be used to make a connection between the panel's USB Port, Type B and a USB port on the PC. The ***C-more*** Programming Software will install a USB driver on the PC during the software installation.

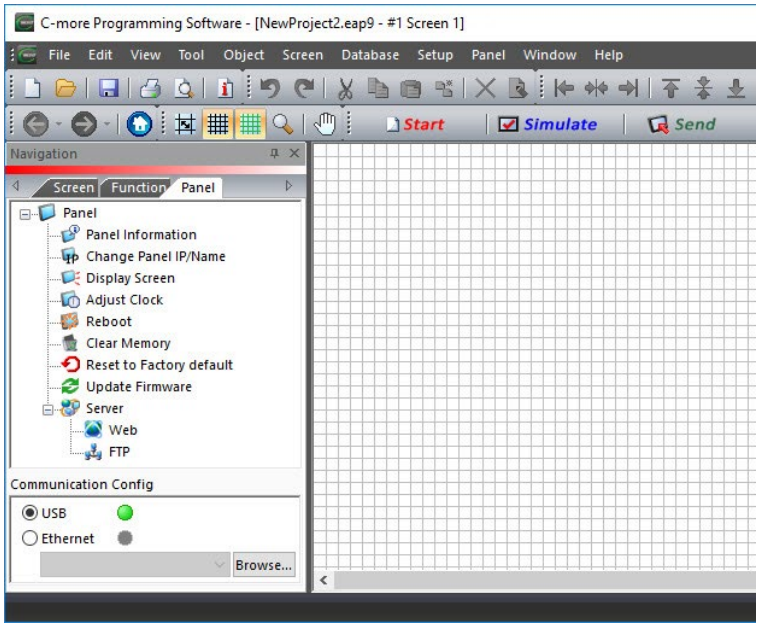


If the USB connection to the panel is recognized by the PC, you will hear the Windows device-recognized-sound when the powered panel is connected to the PC. The driver will appear in the Windows Device Manager under Network adapters as **C-more EA9**.



No Communications Between Panel and PC (Personal Computer) via USB (cont'd)

The ***C-more*** software will then identify the USB connection with a green indicator.

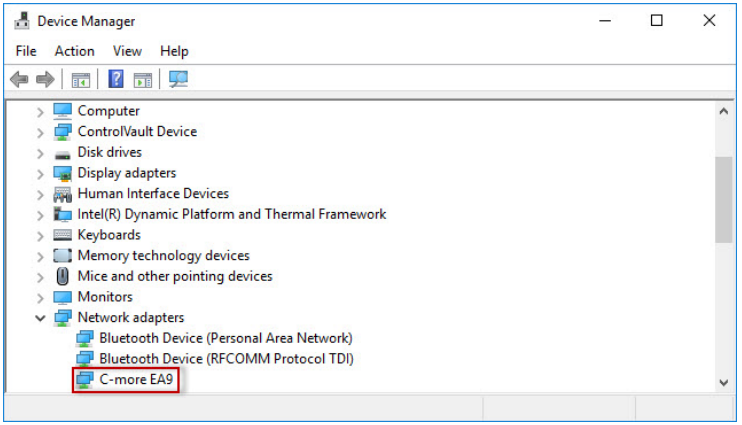


This Communication indicator appears on the Panel tab in the Navigation window and in the Project Transfer or Read from Panel windows.

USB Driver Troubleshooting

Check the USB driver using Windows Device Manager:

With the ***C-more*** panel connected to the PC, on the PC, open **Control Panel--> System -->Hardware tab --> Device manager**. Next expand "Network adapters".
The ***C-more*** driver is named **C-more EA9** as shown below:



If the ***C-more*** programming software Communication Config dialog USB indicator is red, and the driver does not appear in Device Manager,

1) Unplug both ends of the cable and replug them in.
2) If that does not establish communication, plug into a different USB port on the PC.
3) If there are any USB hubs or other devices being used, temporarily eliminate them to see if this solves the problem.
4) Reinstall the ***C-more*** HMI USB driver.

USB Driver Troubleshooting (cont'd)

The ***C-more*** USB driver installation utility is bundled with the ***C-more*** software installation files. If you have a ***C-more*** software USB, the file is in the root, called **EA9USBDriver.exe**.

If you downloaded the software, when you extracted the files, the **EA9USBDriver.exe** was extracted to the location you chose. First, close the ***C-more*** software and disconnect the USB cable from the PC. Then, browse to **EA9USBDriver.exe** and run it.

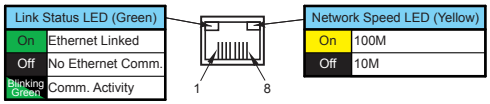
Plug the USB cable into the PC and the *C-more* panel.

The Found New Hardware Wizard will prompt you to search for the driver. Select "No not this time" and click **Next**. Select "Install the Software automatically (Recommended)" and click **Next**. Click **Continue Anyway** in the Windows Logo warning popup. Click **Finish**.

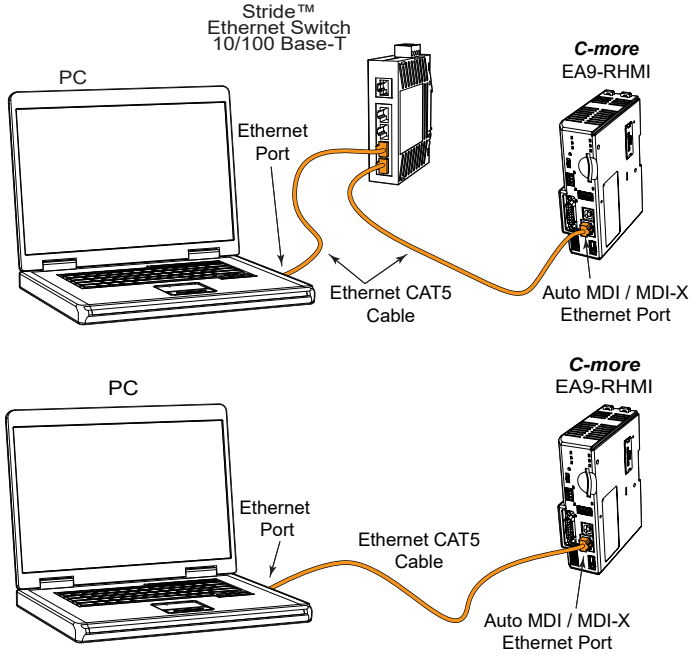
Open the project in the ***C-more*** software. The Communication Config (and Transfer Project) USB indicator should be green.

No Communications Between Panel and PC (Personal Computer) via Ethernet

When using an **Ethernet** connection to communicate between the HMI and the PC and the communications does not seem to be working, the first area to check is the Ethernet status indicators located next to the **10/100 Base-T Ethernet Port** on the rear of the panel. The **Link Status LED** must be displaying a steady or blinking green.



If using **Ethernet**, there are two basic ways to make the connection. You can use an **Ethernet** cable to make a direct connection between the HMI and PC or use an **Ethernet** cable from the HMI to a switch and then to the PC.



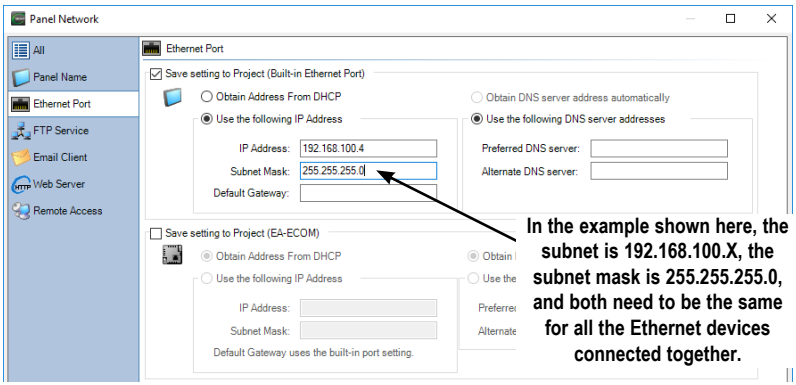
Use the ***C-more*** programming software to check the status of the **Ethernet** communications. From the **Navigation** window, select the **Panel** tab. At the bottom of the **Panel** tab is the **Communication Config** dialog box. Select the **Browse** button. If the connection is working the panel will be listed in the online link list. Select the panel and then select OK. If the **Ethernet** communications to the panel is working, then there should be a "green" indicator next to the **Ethernet** selection. There should also be an **IP Address** shown in the browse box below the **Ethernet** selection. If the **Ethernet** radio button is "red", then you will need to check your **Ethernet** cables and connections or **Browse** for the panel.

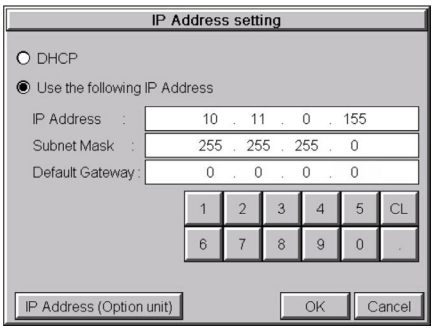
No Communications between Panel and PC (Personal Computer) (cont'd)

There can also be a conflict with another Ethernet connection that may be using the same **IP Address**. You may want to check the setup both in the HMI and also in your PC. As a starting point, it is best to start with an assigned IP Address and Subnet mask, mainly to eliminate IP addressing conflicts. Use the ***C-more*** programming software and open the **Panel Network** dialog box under the **Main Menu's Setup** drop down menu. Click on **Ethernet Port** to display the dialog box used to set up the HMI's **Ethernet** port.

Another cause of an Ethernet communications problem is the HMI doesn't show up in the node list, which can be caused by the PC having a firewall.

The figure below shows the **Panel Network** dialog box with the **Ethernet** port window opened. The **Save settings to Project** check box is checked, and we are using the **Use the following IP Address** selection by checking its radio button. **The subnet example (192.168.100.X) and the subnet mask example (255.255.255.0) must be the same for both the panel and the PC.** See the ***C-more*** programming software on-line help for additional details regarding the **Panel Network**.



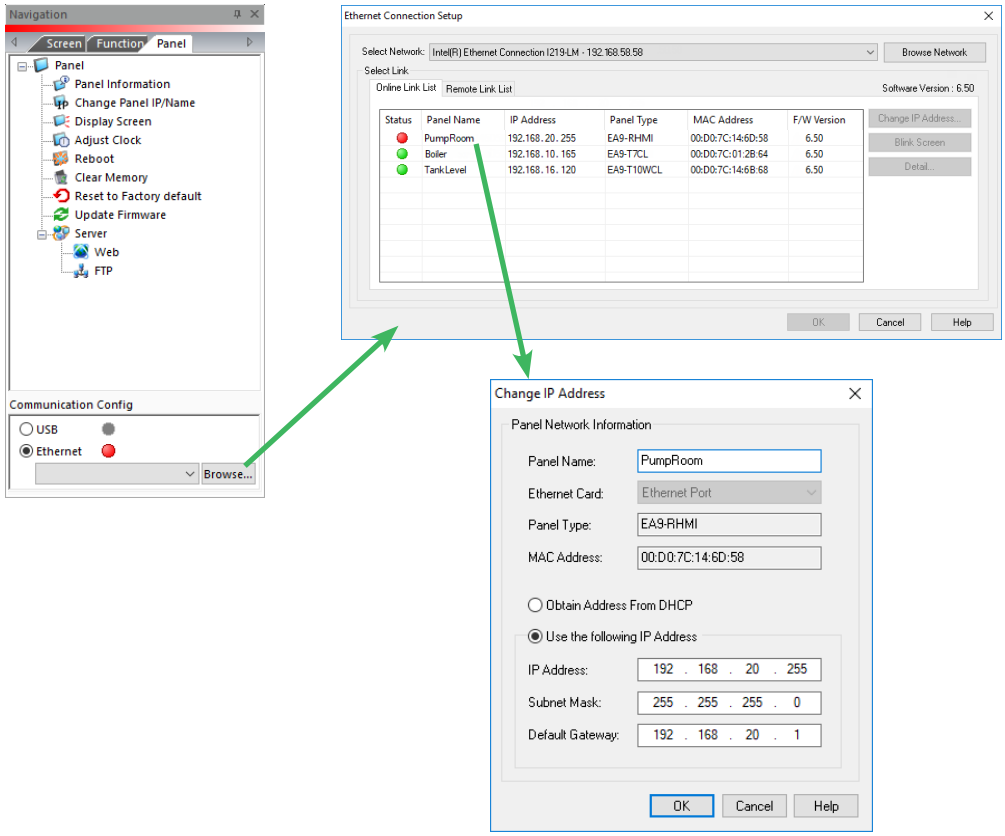


The **IP Address** assigned to the HMI can also be checked or edited by using the system setup screens built into the HMI. See **Chapter 5: System Setup Screens** for additional information.

The figure to the left shows a different example of the panel's **System Setup Screens' Ethernet Port** dialog box for configuring the **Ethernet** port. Again, make sure the subnet (10.11.0.x) and subnet mask (255.255.255.0) is the same for both the panel and the PC.

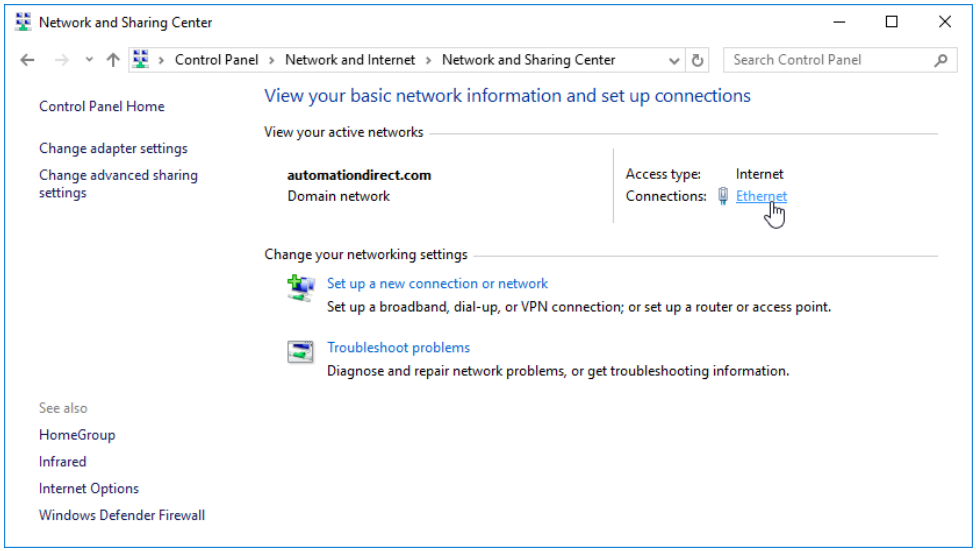
No Communications between Panel and PC (Personal Computer) (cont'd)

Another option for accessing the **IP Address** assigned to the HMI is to use the ***C-more*** Programming Software. Open the **Navigation** window's **Panel** tab and click on the **Browse** button under the **Communication** window at the bottom. This will open the **Ethernet Connection Setup** window. The **Online Link List** tab will show all of the connected panels. If none are shown, try clicking the **Browse Network** button to search for attached devices. Double click on the **Panel Name** you want to access. This will bring up the **Change IP Address** window. In this window changes can be made to the panel's name, IP address, subnet mask, and default gateway.



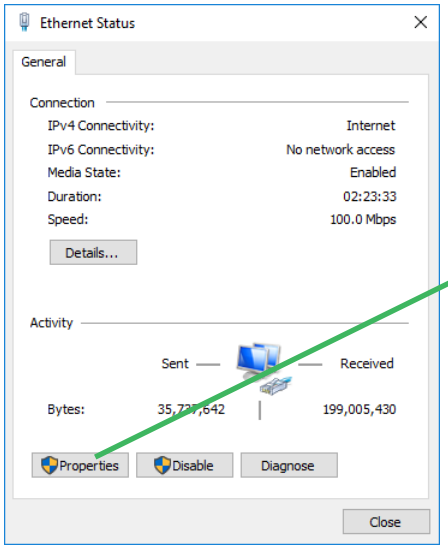
No Communications between Panel and PC (Personal Computer) (cont'd)

Check the **IP Address** setting of the PC by opening the Windows operating system's **Control Panel**. Select **Network and Internet** and then **Network and Sharing Center**. Click on **Ethernet** as shown below.

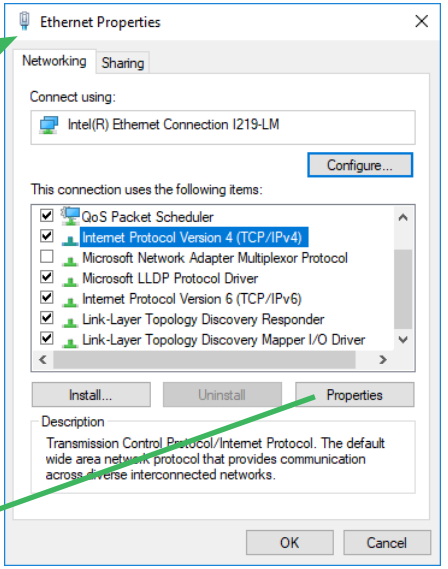


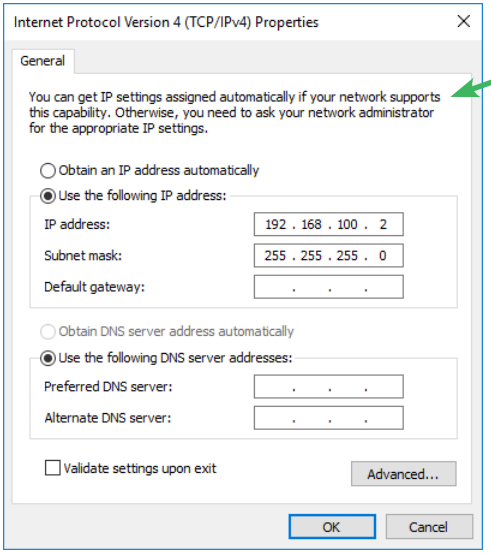
The Ethernet Status dialog will open. Select **Properties** and choose the appropriate **Internet Protocol** in the connections list. Select **Properties.** The **Internet Protocol Properties** window will open. Make sure the **Subnet Mask** is set the same for both the HMI and PC and also make sure that the **IP Addresses** do not conflict.

No Communications between Panel and PC (Personal Computer) (cont'd)



NOTE: *If a DHCP Server is being used to obtain the* ***IP Address*** *for the PC, there are ways to identify the* ***IP Address.*** *For example, if using* ***Windows 10,*** *open a* ***Command Prompt (Run > CMD)*** *and type* ***IPCONFIG /ALL.*** *A list of all Ethernet assignments for the PC will be shown.*

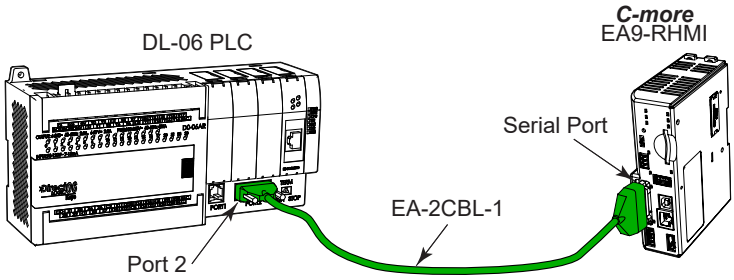




No Communications Between Panel and PLC

The communications between the ***C-more*** HMI and designated PLC or controlling device can be accomplished by either a serial connection or by an **Ethernet** connection to the HMI's **10/100 Base-T Ethernet Port**. The EA9-RHMI includes a 15-pin RS-232/422/485 port and a 3-wire RS-485 connection.

1.) If the HMI and PLC are connected serially and communications seemed to have stopped working, then first check the **TxD** and **RxD** status indicators on the front of the HMI at the connected port for activity.



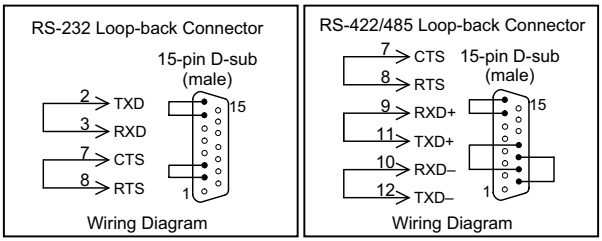
If there is no activity on one or both the **TxD** and **RxD** status indicators, then it should be suspected that either:

- serial comm port settings are incorrect
- the cable is bad and needs to be replaced
- the serial port on the panel is defective
- the PLC serial port is bad
- No TxD also can indicate no tags being polled on device

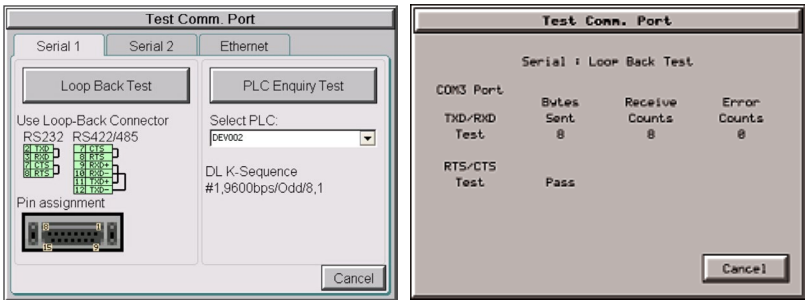
No Communications between Panel and PLC (cont'd)

The serial ports on the ***C-more*** HMI can be tested using the HMI's system setup screens. Access the ***Main Menu*** of the HMI's system setup screens, press the **Test Menu** button, then press the **Test Comm. Port** button and select the appropriate port tab. You will need to fabricate a **Loop Back Connector** for the type of serial connection that is being used in your application, either RS-232 or RS-422/485, per the wiring diagrams shown below. Plug the loop back connector into the panel's 15-pin PLC serial communications port and then press the **Loop Back Test** button to run the test. See **Chapter 5: System Setup Screens** for additional information.

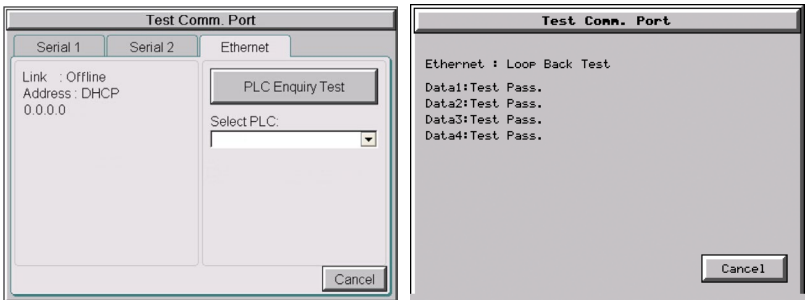
Loop back connector wiring diagrams:



System setup screens **Test Comm. Port** dialog boxes:



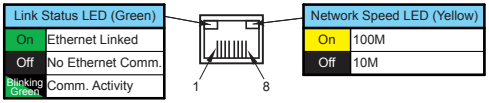
The **PLC Enquiry Test** can also be performed to determine if the **Ethernet** communication is working correctly between the panel and designated PLC.



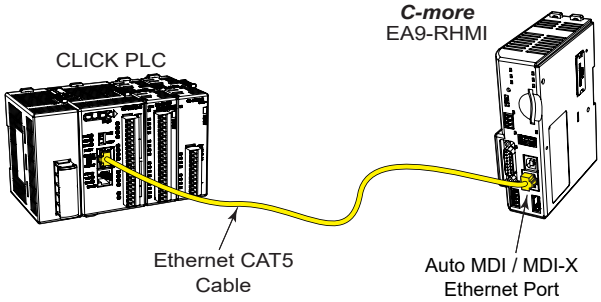
NOTE: *The EA9-RHMI does not have a Serial 3 Port.*

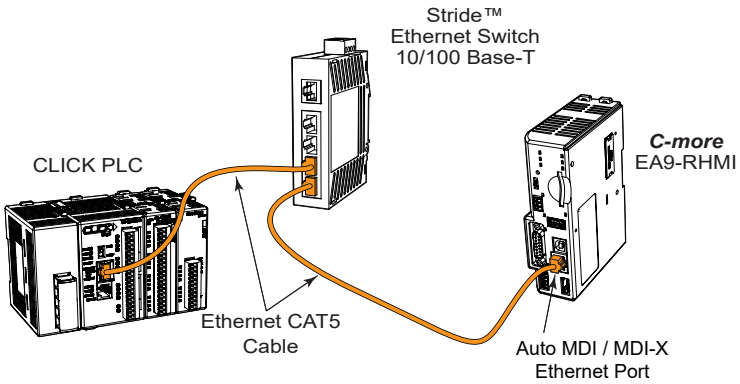
No Communications between Panel and PLC (cont'd)

2.) If using an **Ethernet** connection between the HMI and the PLC, and there is a problem with the communications, the first area to check is the **Ethernet** status indicators located next to the **10/100 Base-T Ethernet Port** (shown below) on the HMI.



There are two basic ways to make the connection. You can connect directly from the HMI to the PLC or connect from the HMI to a switch that is also connected to the PLC.

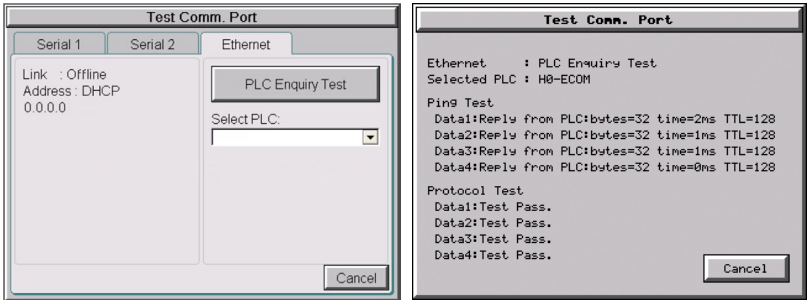




Check the status indicators that may be included with the **Ethernet** communications module or device that is part of the PLC. Refer to the PLC's Ethernet user manual for further troubleshooting information.

No Communications Between Panel and PLC (cont'd)

The Ethernet port on the ***C-more*** HMI can be tested by using the HMI's system setup screens. Access the **Main Menu** of the panel's system setup screens, press the **Test Menu** button and then press the **Test Comm. Port** button. Select the **Ethernet** tab in the **Test Comm. Port** dialog box, make sure the Ethernet port is connected to an Ethernet switch or other Ethernet communications device select a PLC from the drop down selection box, and then press the **PLC Enquiry** button to run the test. See **Chapter 5: System Setup Screens** for additional information.



If a PC running the ***C-more*** programming software is connected to the **Ethernet** network that is also connected to both the HMI and PLC, then certain functions in the software, such as the **Main Menu's Setup** drop down selection for **Panel Manager** or **Panel Network** and the **Main Menu's Panel** drop down selection for **Panel Information**, can be used to help troubleshoot problems with the HMI's communications and operation. See the ***C-more*** programming software's on-line help for additional information.

IP Address in System Setup Screens Displays 0.0.0.0

NOTE: *If entering an* ***IP Address*** *for the* ***C-more*** *HMI using the* ***System Setup Screens,*** *and the IP Address keeps displaying 0.0.0.0, even after entering an IP address, the panel is not functionally connected to an active network. Either the cable, hub, or switch is bad. The entered* ***IP Address*** *is stored in the panel's memory but won't show up until a good connection is established. Keep in mind that if in the* ***C-more*** *programming software's* ***Panel Network*** *dialog box, under* ***Ethernet Port****, you have checked the* ***Save settings to Project*** *check box and have entered an* ***IP Address*** *of 0.0.0.0, then anytime the project is transferred to the panel, the panel's* ***IP Address*** *will be overwritten with the entered address.*

Difficulty Connecting to the Panel over the Internet (Web Server and Remote Access Features)

1) Refer to the software help file topics **Panel Network** and **Remote Access Setup** for information on configuring the Remote Access accounts, the Web Server Function and the panel IP Attributes.
2) In the Ethernet Port window, if DHCP is selected for assigning the IP address, verify the currect address of the panel. The IP address assigned by DHCP may change over time.
3) Note that the Web Server Function must be enabled in the Web Server window before the Remote Access Server Function can be accessed on the panel.
4) Verify that the correct TCP ports have been opened and forwarded on the router controlling access to the network where the ***C-more*** panel resides.
5) If two ***C-more*** HMIs are on a network behind a firewall and they have the same **Remote Access port number**, the router will use the first entry in the Port Forwarding setup that it encounters. The same ***C-more*** HMI will always come up even if the two HMIs have two different Web Server Port numbers.
6) When entering the URL in Internet Explorer to connect the ***C-more*** web server using a port number other than the default (80), be sure to use the full URL text including the prefix "http://". The URL should be http://xxx.xxx.xxx.xxx:aaaaa where xxx.xxx.xxx.xxx is the IP address of the HMI and aaaaa is the port number configured in the Web Server window of the Panel Network setting.

PLC Protocol Error Codes

The ***C-more*** HMI includes built-in PLC communication protocol diagnostics that monitor the exchange of data between the panel and the PLC. The diagnostics look for the proper exchange of data, correct handshaking signals, addressing errors, incorrect data bytes, wrong packet format, etc. The diagnostics also monitor and report any of the errors that the designated PLC would normally generate if there is a problem with the PLC's communications. Each brand of PLC has its own unique set of diagnostic errors that are typically communicated over the PLC's communications port. The PLC generated errors are interpreted by the ***C-more*** software. See the PLC manufacturer's user manuals for additional details on the designated PLC's errors.

If a ***C-more*** communications error does occur, the error message will be displayed in the upper left of the ***C-more*** screen and the **Error Code** is recorded in the panel's error log. If a PLC error occurs, the PLC error code number will appear across the top of the screen and the PLC error message may not be included in some cases. The error log can be viewed using the system setup screens. See **Chapter 5: System Setup Screens** under the **Information** window to bring up the Error tab which includes a description of the logged data.

A detailed list and description of the various PLC protocol errors can be found in **Appendix A: PLC Protocol Error Codes**.

PLC Protocol Error Codes example:

Error Codes for *Direct* Logic – K-Sequence		
Error Code	**Error Message**	**Description**
PLC-001	PLC Communication Timeout (for single PLC) %Device% PLC Communication Timeout (for multiple PLCs, such as RS-422/485)	A timeout occurred after sending a request to the PLC %Device%. %Device% indicates the device name, such as DEV001. Example error message for multiple PLCs: DEV001 PLC Communication Timeout
PLC-002	NAK received from PLC	A negative acknowledgement (NAK) control code has been generated during a read/write request.
PLC-004	STX is not found	A Start of Text (STX) control code was not found in the data packet received from the PLC.

HMI Runtime Errors

The ***C-more*** HMI includes built-in diagnostics that check for proper operation of the panel when it is running a project that has been transferred to its memory. Faults detected while the panel is running will produce a "Runtime" error. These errors are displayed in the upper left of the panel's display and are also recorded in the panel's error log. The error log can be viewed using the system setup screens. See **Chapter 5: System Setup Screens** under the **Information** window to bring up the **Error** tab which includes a description of the logged data.

A detailed list and description of the various HMI runtime errors can be found in **Appendix B: HMI Runtime Errors**.

HMI Runtime Errors example:

No.	Error Log Code	Error Message Located at upper left of screen	Error Message Tag	Tag Error Code Value	System Screen Info > Error	Cause
Log Error						
1	RTE-001	Log Failed. Not enough Memory Space in %Device%	SYS ERR ERRORCODE	2001	MM/DD/YY HH/MM/SS Error Code RTE-001	The size of the destination memory is not large enough to store the data.
2	RTE-002	Log Failed. %Device% cannot be found	SYS ERR ERRORCODE	2002	MM/DD/YY HH/MM/SS Error Code RTE-002	No device available or the device is defective.

Panel Constantly Displays "Initializing" when Powering Up

If the HMI constantly displays a message reading "Initializing" while powering up, then check the following possible causes.

1) ***C-more*** supports USB 1.1 and 2.0 memory devices. Ensure that the USB device is 1.1 or 2.0 or backward compatible to support version 2.0
2) The project that is loaded into the panel's internal SDRAM memory is corrupted. Either use the ***C-more*** programming software to clear the panel's memory and re-transfer the project to the HMI or move the RUN /STOP switch to the STOP position. Select the **Memory** menu and use either **Clear Memory** or **Set to Factory Default** to clear the panel's memory and re-transfer the project to the HMI. (see Chapter 5 - System Setup Screens)
3) An SD memory card has been plugged into an SD card slot and the SD card either has no project stored on it or the project is corrupted. Remove the SD memory card from the SD card slot and either load the project to the panel's built-in Flash memory, re-format the SD card using the SD formatter available from SDcard.org, or try a different SD memory card.

NOTE: *In the Error Log you may find the error RTE-500 - Check Sum Error, which is defined as "Memory in the panel has been corrupted by power loss, etc." If this is the case, try cycling power to the panel, re-transfer the project to the panel, and re-transfer the firmware, etc. in sequential steps to try to correct the problem.*

Data Not Logging Problems

If the data log is missing entries, or a Runtime Error for the Log Errors as shown in **Appendix B: HMI Runtime Errors** is seen, then check the following possible causes.

1) Check that the memory devices that were selected for **Data Storage** under the ***C-more*** programming software's **Main Menu - Setup** drop down - **Panel Manager** dialog box are plugged into their proper locations. Alarms, messages and screen captures can be independently selected to be saved to either a USB pen drive plugged into the USB Port - Type A, or an SD card plugged into the SD Card Slot.
2) Ensure that the SD card has been formatted with the SD formatter provided by SDcard.org.
3) The memory device could be bad. If possible, check it by plugging it into a PC that has the ability to access the memory device. Also, not all USB devices are compatible with the ***C-more*** HMIs. Try using the ***AutomationDirect*** USB Pen Drive, p/n USB-FLASH. Check **System Screen, Memory** for the presence of the USB device inserted.

Electrical Noise Problems

Noise is one of the most difficult problems to diagnose. Electrical noise can enter a system in many different ways which fall into one of two categories, conducted or radiated. It may be difficult to determine how the noise is entering the system, but the corrective actions for either of the types of noise problems are similar.

- Conducted noise is when the electrical interference is introduced into the system by way of an attached wire, panel connection, etc. It may enter through a power supply connection, the communication ground connection, or the chassis ground connection.
- Radiated noise is when the electrical interference is introduced into the system without a direct electrical connection, much in the same manner as radio waves.

While electrical noise cannot be eliminated, it can be reduced to a level that will not affect the system.

- **Most noise problems result from improper grounding of the system. A good earth ground can be the single most effective way to correct noise problems.** If a ground is not available, install a ground rod as close to the system as possible. Ensure all ground wires are single point grounds and are not daisy chained from one device to another. Ground metal enclosures around the system. A loose wire can act as a large antenna, introducing noise into the system. Therefore, tighten all connections in your system. Loose ground wires are more susceptible to noise than the other wires in your system. Review **Chapter 4: Installation & Wiring** if you have questions regarding how to ground the HMI.
- Electrical noise can enter the system through the power source for the HMI. Installing a properly wired isolation transformer (neutral grounded) for all AC sources can help the problem, but only if it is wired correctly. DC sources should be well-grounded good quality supplies.
- Never run communication cables or low-voltage power wiring close to high voltage wiring or pulse generating wiring that controls such devices as solenoids, servos, VFDs, etc.

Touch Screen Not Working

The EA9-RHMI is compatible with ELO™ Single Touch Resistive/SAW and EETI eGalax Single Touch Resistive and single-touch Protective Capacitive touch screen drivers.

Check with the manufacturer of the touch screen monitor about what touch screen drivers are supported by the touch screen. See page 8-9 for a list of compatible monitors and manufacturers.

Chapter 9
Replacement Parts

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Replacement Parts Overview

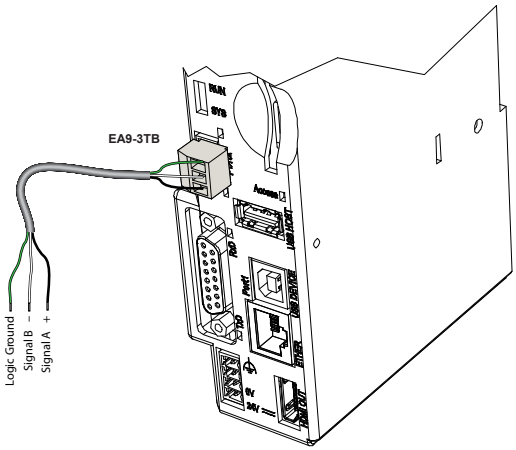
Part Number		Description
EA9-3TB		***C-more*** pluggable terminal block, replacement, 3-pole. Package of 2. For use with 3-wire RS485 communications port on ***C-more*** EA9 series panels.
C0-4TB		CLICK terminal blocks, replacement, 4-pole. Package of 2. For use with CLICK PLCs and ***C-more*** EA9-RHMI.

3-wire Communications Terminal Block – EA9-3TB

C-more EA9 series 3-wire communications terminal block replacement. One (1) terminal block is supplied with each HMI. Two (2) connectors are supplied when ordered as a replacement part.

Tightening Torque	
Cable torque	Minimum 1.95 lb-in (0.22 Nm)

NOTE: *Use 60/75 °C copper conductors only, 24-12 AWG*



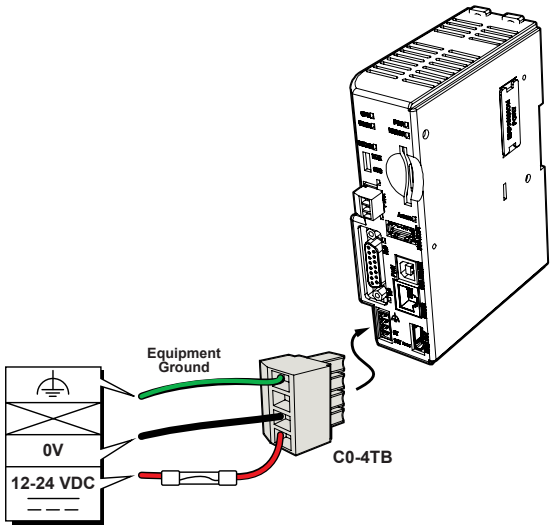
9

DC Power Connector Replacement – C0-4TB

EA9-RHMI 4-position DC power connector terminal block replacement. One (1) DC Power Connector is supplied with each HMI. Two (2) connectors are supplied when ordered as a replacement part.

Tightening Torque	
Power supply cable torque	32-35 oz-in (0.22- 0.25Nm)

NOTE: *Use 60/75 °C copper conductors only, 24-12 AWG*



HMI and PLC Error Code Tables

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Introduction

The ***C-more*** family of HMIs are capable of communicating with a wide variety of Programmable Logic Controllers. ***C-more*** can communicate over RS232, RS422 and RS485 serial networks as well as Ethernet networks. It communicates with all AutomationDirect PLCs utilizing various protocols. ***C-more*** also communicates with other brands of PLCs by using their different protocols. For a complete list of PLCs and protocols, see **Chapter 6 - PLC Communications**.

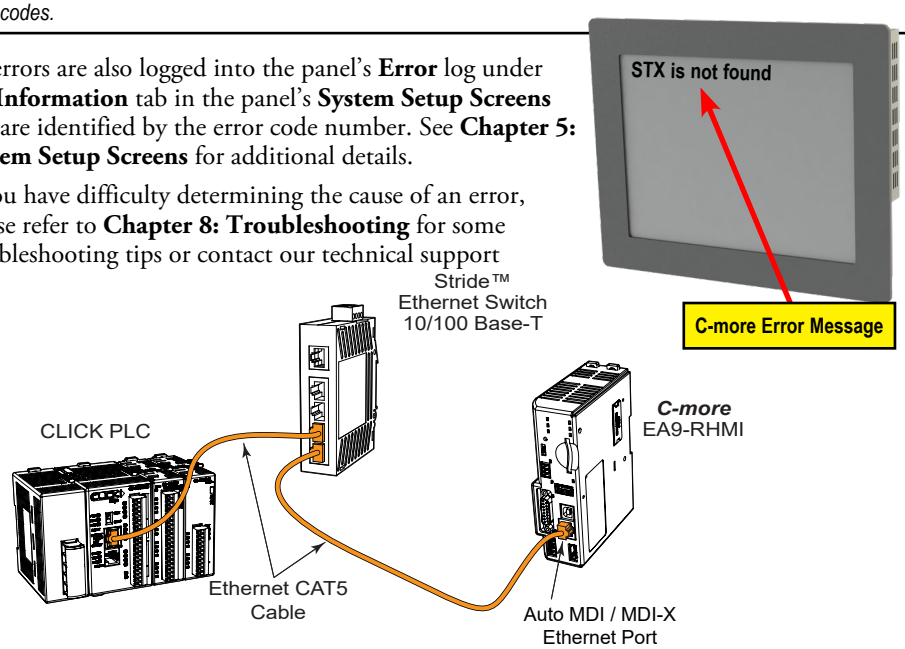
As with any network communications, errors will occur. To make it easier for the user to identify the cause of an error, we have provided an error code table for all of the possible errors that ***C-more*** can detect.

If a ***C-more*** communications error does occur, the error message will appear across the top of the screen. The ***C-more*** HMI also monitors for any errors that are generated by the various PLCs that are connected to it. If any of the PLC generated errors are detected, they are displayed across the top of the panel's display embedded as a hexadecimal value in error code P499's message. An explanation of how the specific PLC error is identified in the panel error code P499 is shown preceding each specific manufacturer's PLC error tables. How the hexadecimal error code value is interrupted is slightly different among different manufacturers, so it is important to check the explanation at the beginning of each manufacturer's tables.

NOTE: *These PLC error codes are provided by the manufacturer of the related PLC and are subject to change by the PLC manufacturer. Please refer to the manufacturer's documentation for a more complete and up-to-date list of error codes.*

All errors are also logged into the panel's **Error** log under the **Information** tab in the panel's **System Setup Screens** and are identified by the error code number. See **Chapter 5: System Setup Screens** for additional details.

If you have difficulty determining the cause of an error, please refer to **Chapter 8: Troubleshooting** for some troubleshooting tips or contact our technical support



C-more HMI Error Code Table

The following table includes all of the error codes and error messages that the panel will display if the listed cause is detected. All of these errors involve problems that could result with the panel communicating with the connected PLC. Be aware that not all of the panel errors are used with each type of PLC that can be connected to the panel.

C-more HMI Error Code Table		
Error Code	**Error Message**	**Cause**
PLC-001	PLC Communication Timeout (for single PLC) %Device% PLC Communication Timeout (for multiple PLCs, such as RS-422/485)	A timeout occurred after sending a request to the PLC %Device%. %Device% indicates the device name, such as DEV001. Example error message for multiple PLCs: DEV001 PLC Communication Timeout.
PLC-002	NAK received from PLC	A negative acknowledgement (NAK) control code has been generated during a read/write request.
PLC-003	EOT received from PLC	An End of Transmission (EOT) control code is sent by the PLC in response to a Read/Write/SetBit request..
PLC-004	STX is not found	A Start of Text (STX) control code was not found in the data packet received from the PLC.
PLC-005	ETX or ETB is not found	Neither an End of Text (ETX) nor an End of Transmission Block (ETB) control code was found in the data packet received from the PLC.
PLC-006	LRC does not match	There was an incorrect Longitudinal Redundancy Check (LRC) control code in the communications packet received from the PLC. This is an indication that the data in the packet is corrupted.
PLC-007	CRC does not match	There was an incorrect Cyclic Redundancy Check (CRC) control code in the communications packet received from the PLC. This is an indication that the data in the packet is corrupted.
PLC-008	Address does not match	The address value returned in the data packet from the PLC is incorrect.
PLC-009	Different function code received from PLC	The function code returned in the data packet from the PLC is incorrect.
PLC-010	Data size does not match	There is an incorrect number of bytes found in the data packet returned from the PLC.
PLC-011	Invalid value in function code	There is an invalid value in the function code.
PLC-012	Invalid command sent to PLC	There was an invalid command sent to the PLC that wasn't recognized by the PLC.
PLC-013	ENQ received from PLC	If the data packet does not include a negative acknowledgement (NAK - 0x15 value) in the defined packet field, then an enquiry (ENQ) control code error will be displayed.
PLC-014	Transaction ID does not match	This error will be displayed if after checking the Transaction ID Bytes in the data packet, there is no match to what was requested.
PLC-015	%Device% No device found	A PLC device designated as %Device% could not be found.
PLC-016	Data byte communication error	0 byte of data is received
PLC-017	Out of address range	The HMI requested a file number larger than 255.
PLC-018	Panel communication timeout	The server panel did not respond when using the Panel Pass Through.
PLC-019	Found in parity error by hardware	An error has been detected in the PLC memory.
PLC-020	Can't open serial port	Cannot open the Serial Port. If this error shows on the panel, it indicates a hardware problem.
PLC-021	PLC number does not match	The PLC number does not match the PLC number configured.
PLC-022	Can't reset DCB	Unable to reset the data communication bit.
PLC-023	Cable not connected properly	Communication cable incorrectly installed.

(***C-more*** HMI Error Code Table continued on the next page)

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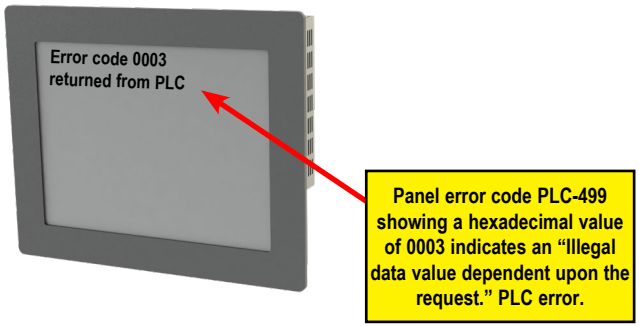
C-more HMI Error Code Table (cont'd)

C-more HMI Error Code Table (cont'd)		
Error Code	**Error Message**	**Cause**
PLC-024	Cannot detect other devices on network	The panel is not communicating with other devices on the network.
PLC-025	Panel not in polling list	
PLC-026	PLC connection timeout	A timeout occured after sending a request to the PLC.
PLC-027	Memory type incorrect	
PLC-028	PLC failed to respond	The PLC failed to respond after sending a request to the PLC.
PLC-029	MemVer ERR HMI x PLCy	When connected to a Do-more PLC the PLC memory version must match the ***C-more*** project PLC memory version. Make sure that the PLC project does not write into the memory version address.
PLC-495	Omron Ethernet Error	An error code specific to Omron Ethernet with a value of XXXX has been returned from the PLC. See the explanation for error code PLC-495 preceding the Omron CS/CJ FINS Ethernet error code tables.
PLC-496	Error code 0xaaaaaaaa returned from PLC	Allen-Bradley EtherNET/IP specific. Encapsulation Error. See the explanation for error code PLC-496 preceding the Allen-Bradley EtherNet/IP error code tables.
PLC-497	Error code 0xaaaaaaaa returned from PLC	Allen-Bradley EtherNET/IP specific. CIP Error. See the explanation for error code PLC-497 preceding the Allen-Bradley EtherNet/IP error code tables.
PLC-498	Error code 0xaaaaaaaa returned from PLC	Allen-Bradley EtherNET/IP specific. Service Packet Error. See the explanation for error code PLC-498 preceding the Allen-Bradley EtherNet/IP error code tables.
PLC-499	Error code XXXX returned from PLC	An error code with a value of XXXX has been returned from the PLC. See the explanation for error code PLC-499 below for Direct LOGIC and preceding each set of PLC error code tables that use this error code.
PLC-500	Cannot write to Serial Port	Data cannot write to the Serial port. Data was sent to the PLC via the Serial Port. If this error shows on the Panel, it indicates a hardware problem.
PLC-700	Not enough buffer memory	There was an error while allocating memory for the read buffer. When this error is displayed, a memory leak may have occurred.
PLC-701	Access to inaccessible PLC memory	Request to inaccessible memory from the HMI layer to the PLC protocol layer. This error is an indication that there is a problem in the HMI layer.
PLC-702	Cannot access by different function code	A Read/Write/SetBit request has been sent to an invalid memory area. This error is an indication that there is a problem in the HMI layer.
PLC-703	Write request to PLC Read Only Memory	A PLC Write request was made to the PLC's Read-Only memory area.This error is an indication that there is a problem in the HMI layer or the PLC protocol layer.
PLC-704	Bad device-access	No device (PLC) exists in the server panel or the device name does not match between the server and client when using the Panel Pass Through.
PLC-705	Protocol does not match	The protocol for the device does Not match between the server and client when using the panel pass through.

*Direct*LOGIC – Panel Error Code PLC-499 Explanation

The PLC-499 error code is used to show any errors that are generated by the connected PLC. The PLC-499 error message includes a four digit hexadecimal value embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the ***Direct***LOGIC communication protocol are represented by a hexadecimal value as shown in the following message example.

Direct LOGIC Error Code PLC-499 Message Example:



*Direct*LOGIC K-Sequence Protocol – PLC Error Code Table

The following table lists the errors that can be generated by the ***Direct***LOGIC PLC when using the K-Sequence protocol.

PLC Error Codes for *Direct* Logic – K-Sequence	
Panel Error Code PLC-499 Hex Value	**Description**
01F8	Error setting value.
020D	Error in key mode - Set switch on PLC CPU to "Term"
021C	Password protected.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

*Direct*LOGIC *Direct*NET Protocol – PLC Error Codes

Only errors as listed in the HMI Error Code Table shown on page A-3 can occur when using the ***Direct***LOGIC ***Direct***NET protocol. There are no PLC generated errors.

DirectLOGIC error code tables continued on the next page.

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Modbus Protocols Error Code P499 Explanation

The following table lists the errors that can be generated by the Modbus protocols:

AutomationDirect CLICK

AutomationDirect *Direct*LOGIC - Modbus (Koyo)

Modicon Modbus RTU

Entivity Modbus RTU

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Error Codes Modbus Protocols		
Panel Error Code P499 Hex Value	**Name**	**Meaning**
0x0001	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is unconfigured and is being asked to return registered values.
0x0002	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server (or slave). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers, the PDU addresses the first register as 0 and the last one as 99. If a request is submitted with a starting register address of 96 and a quantity of registers of 4, then the request will successfully operate (address-wise at least) on registers 96, 97, 98, 99. If a request is submitted with a starting register of 96 and a quantity of registers of 5, then the request will fail with Exception code 0x02 "Illegal Data Address" since it attempts to operate on registers 96, 97, 98, 99 and 100 and there is no register with address 100.
0x0003	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the Modbus protocol is unaware of the significance of any particular value of any particular register.
0x0004	SLAVE DEVICE FAILURE	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.

*Direct*LOGIC ECOM Protocol – PLC Error Codes

Only errors as listed in the HMI Error Code Table shown previously in this Appendix can occur when using the ***Direct***LOGIC ECOM protocol. There are no PLC generated errors.

Productivity Error Code P499

*NOTE: The following errors can be generated from the designated PLC, are monitored by the **C-more** HMI, and are are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Error Codes for Productivity	
Panel Error Code P499 Hex Value	**Meaning**
0x0001	The function code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is unconfigured and is being asked to return registered values.
0x0002	Address out of range. Check to make sure that the ***C-more*** tag and System ID match the Productivity Programming Software Tag Name and System ID. The project file in the Productivity system and the imported CSV into ***C-more*** must be in sync with each other.
0x0003	A value contained in the query data field is not an allowable value for the server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the Modbus protocol is unaware of the significance of any particular value of any particular register.
0x0004	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.

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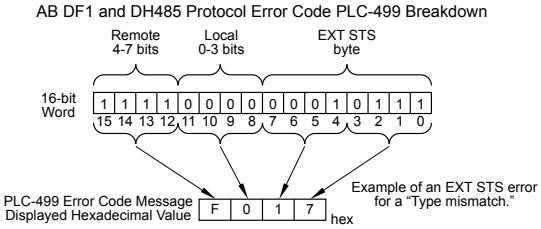
AutomationDirect Do-More Error Codes

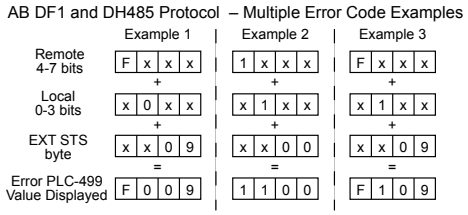
PLC Errors for Do-more		
Error Code	**Description**	**Resolution**
0x01	Unknown Command	Should only occur if message has been corrupted or protocol version is mismatched. Check versions and update appropriately. If versions are correct, check cabling, routing and switches for bad packets.
0x02	Out of Sessions	Too many devices connected to the CPU. Reduce number of devices connected.
0x03	Illegal Operation	Occurs when permission level is not sufficient for the operation performed by the panel. Increase the permission level to correct the problem.
0x04	Invalid Session	Session number does not match for sending device. Re-establish connection by power cycling or sending updated project.
0x05	Out of Range	Invalid address exists. Ensure that address range is expanded and load configuration to the CPU.
0x06	Invalid Argument	Occurs when message cannot be parsed correctly. Could occur from noise or faulty wiring.
0x07	Program Update Active	Wait until program update is complete.
0x08	No Token	Occurs when client attempts to update the project without first acquiring the program update token.
0x09	Program Update Inhibited	Occurs when client attempts to update the project while ST21 is true. This allows the customer to programmatically prevent the project from being updated.
0x0A	System Configuration Update Active	Wait until System Configuration update is complete to continue communications.
0x0B	Invalid Mode	Ensure that the switch on the CPU is in Term mode.
0x0C	Mode Change Active	Occurs when a PLC mode change is attempted while a mode change is in progress. In some cases it takes several scans for a mode change.
0x0D	Mode Locked	Occurs when mode change is attempted and keyswitch is not in Term.
0x0E	Invalid Password	Enter Do-more password in Password field of ***C-more*** Panel Manager for this device.
0x0F	Resource Locked	Occurs when trying to update a tag that is forced. Force must be removed in order to update the tag.
0x010	Doc Update Active	Occurs when someone attempts to access the documentation file while it is being written back to ROM.
0x011	Invalid Driver	Occurs when attempting to read driver data from a driver that doesn't exist.
0x012	Invalid Driver Data	Occurs when attempting to read a driver data type that isn't valid.
0x013	Shared RAM write failed	Occurs when attempting to read or write to a module's shared RAM and it fails. Usually occurs when the module has gone bad.

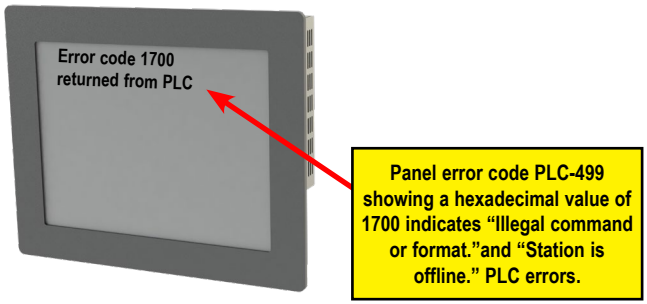
Allen-Bradley – Panel Error Code PLC-499 Explanation

The PLC-499 error code is used to show any errors that are generated by the connected PLC. The PLC-499 error message includes a four digit hexadecimal value embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the Allen-Bradley DF1 and DH485 communication protocols are represented by a hexadecimal value as shown in the following diagram. Please note that the error code is broken down into three sections. It is possible for more than one type of PLC error to be displayed in this value.

Allen-Bradley Error Code PLC-499 Message Example:







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Allen-Bradley DF1 & DH485 Protocols – PLC Error Code Tables

The following PLC error code tables cover possible errors that are detected by the panel from Allen-Bradley PLCs using the DF1 and DH485 protocols. DF1 includes full and half duplex communications for the MicroLogix 1000, 1100. 1200, 1400, 1500, SLC 5/03, /04, /05, ControlLogix, CompactLogix and FlexLogix, and full duplex communications for the PLC5. DH485 includes all MicroLogix and SLC500 PLC's and any communication connection using an Allen-Bradley AIC device using the DH485 protocol.

***NOTE:** The following errors can be generated from the designated PLC, are monitored by the **C-more** HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Errors for Allen-Bradley DF1 and DH485 Protocols, Local STS Errors (0-3 bits)	
Panel Error Code PLC-499 Hex Value	**Description**
0x0	Success; no error.
0x1	DST node is out of buffer space.
0x2	Cannot guarantee delivery; link layer. (The remote node specified does not ACK command.)
0x3	Duplicate token holder detected.
0x4	Local port is disconnected.
0x5	Application layer timed out waiting for response.
0x6	Duplicate node detected.
0x7	Station is offline.
0x8	Hardware fault.

PLC Errors for Allen-Bradley DF1 and DH485 Protocols, Remote STS Errors (4-7 bits)	
Panel Error Code PLC-499 Hex Value	**Description**
0x0	Success; no error.
0x10	Illegal command or format.
0x20	Host has a problem and will not communicate.
0x30	Remote node host is missing, disconnected, or shut down.
0x40	Host could not complete function due to hardware fault.
0x50	Addressing problem or memory protect rungs.
0x60	Function not allowed due to command protection selection.
0x70	Processor is in Program Mode.
0x80	Compatibility mode file missing or communication zone problem.
0x90	Remote node cannot buffer command.
0xA0	Wait ACK (1775 KA buffer full).
0xB0	Remote node problem due to download.
0xC0	Wait ACK (1775 KA buffer full).
0xD0	not used
0xE0	not used
0xF0	Error code in the EXT STS byte. See the error code table on the next page.

(PLC generated error codes for the Allen-Bradley DF1 protocol continued on the next page)

Allen-Bradley DF1 & DH485 Protocols – PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley DF1 and DH485 Protocols, EXT STS Command Code for F0 Command	
Panel Error Code PLC-499 Hex Value	**Description**
0x0	not used
0x1	A field has an illegal value.
0x2	Fewer levels specified in address than minimum for any address.
0x3	More levels specified in address than system supports.
0x4	Symbol not found.
0x5	Symbol is of improper format.
0x6	Address does not point to something usable.
0x7	File is wrong size.
0x8	Cannot complete request; situation has changed since start of the command.
0x9	Data or file size is too large.
0xA	Transaction size plus word address is too large.
0xB	Access denied; improper privilege.
0xC	Condition cannot be generated; resource is not available.
0xD	Condition already exists; resource is readily available.
0xE	Command cannot be executed.
0xF	Histogram overflow.
0x10	No access.
0x11	Illegal data type.
0x12	Invalid parameter or invalid data.
0x13	Address reference exists to deleted area.
0x14	Command execution failure for unknown reason; possible PLC 3 histogram overflow.
0x15	Data conversion error.
0x16	Scanner not able to communicate with 1771 rack adapter.
0x17	Type mismatch.
0x18	1771 module response was not valid.
0x19	Duplicated label.
0x22	Remote rack fault.
0x23	Timeout.
0x24	Unknown error.
0x1A	File is open; another node owns it.
0x1B	Another node is the program owner.
0x1C	Disk File is write protectid or otherwise unavailable
0x1D	Disk File is being used by another application. Update not performed (offline only).
0x1E	Data table element protection violation.
0x1F	Temporary internal problem.

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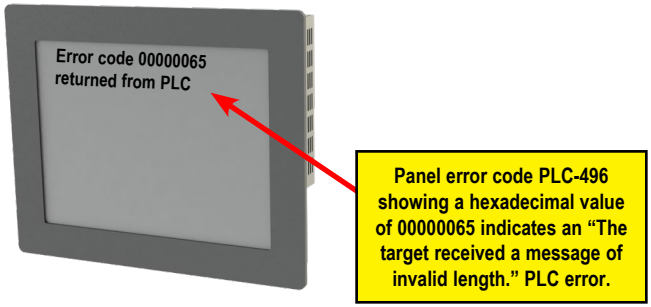
Allen-Bradley EtherNet/IP Protocol – Panel Error Code PLC-496, 497 and 498 Explanation

The PLC-496, PLC-497, and PLC-498 error codes are used to show any errors that are generated by the connected PLC. These error messages include an eight digit hexadecimal value displayed embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the Allen-Bradley EtherNet/IP communication protocol is represented by a hexadecimal value as shown in the following message example.

Allen-Bradley Error Code PLC-496, 497, 498 Message Example:



Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables ControlLogix, CompactLogix, and FlexLogix

The following PLC error code tables cover possible errors that are detected by the panel from Allen-Bradley PLCs using the EtherNet/IP protocol. This includes all ControlLogix, CompactLogix and FlexLogix PLCs.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-496 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Errors for Allen-Bradley EtherNet/IP Protocol –Encapsulation Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-496 Hex Value	**Description**
0x00000001	The sender issued an invalid or unsupported encapsulation command.
0x00000002	Insufficient memory resources in the receiver to handle the command. You can get this error if the 1761-NET-ENI cannot connect to the PLC serially.
0x00000003	Poorly formed or incorrect data in the data portion of the encapsulation message.
0x00000004 - 0x00000063	Reserved for legacy (Rockwell Automation).
0x00000064	An orginator used an invalid session handle when sending an encapsulation message to the target.
0x00000065	The target received a message of invalid length.
0x00000066 - 0x00000068	Reserved for legacy (Rockwell Automation).
0x00000069	Unsupported encapsulation protocol revision.
0x0000006a - 0x0000ffff	Reserved for future expansion.

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010100	Connection Manager: Connection in Use or Duplicate Forward Open.
0x010103	Connection Manager: Transport Class and Trigger combination not supported.
0x010106	Connection Manager: Ownership Conflict.
0x010107	Connection Manager: Connection not found at target application.
0x010108	Connection Manager: Invalid connection type (problem with type or priority).
0x010109	Connection Manager: Invalid connection size.
0x010110	Connection Manager: Device not configured.
0x010111	Connection Manager: RPI not supported. Could also be problem with inactivity timeout.
0x010113	Connection Manager: Connection Manager cannot support any more connections.
0x010114	Connection Manager: Either the vendor ID or the Product Code in the key segment did not match the device.
0x010115	Connection Manager: Product Type in the key segment did not match the device.
0x010116	Connection Manager: Major or minor revision information in the key segment did not match the device.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

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Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables ControlLogix, CompactLogix, & FlexLogix (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010117	Connection Manager: Invalid connection point.
0x010118	Connection Manager: Invalid configuration format.
0x010119	Connection Manager: Connection request fails since there is no controlling connection currently open.
0x01011a	Connection Manager: Target application cannot support any more connections.
0x01011b	Connection Manager: RPI is smaller than the Production Inhibit Time.
0x010203	Connection Manager: Connection cannot be closed since the connection has timed out.
0x010204	Connection Manager: Unconnected Send timed out waiting for a response.
0x010205	Connection Manager: Parameter error in Unconnected Send service.
0x010206	Connection Manager: Message too large for Unconnected message service.
0x010207	Connection Manager: Unconnected acknowledge without reply.
0x010301	Connection Manager: No buffer memory available.
0x010302	Connection Manager: Network Bandwidth not available for data.
0x010303	Connection Manager: No Tag filters available.
0x010304	Connection Manager: Not configured to send real-time data.
0x010311	Connection Manager: Port specified in Port segment not available.
0x010312	Connection Manager: Link address specified in port segment not available.
0x010315	Connection Manager: Invalid segment type or segment value in path.
0x010316	Connection Manager: Path and Connection not equal in close.
0x010317	Connection Manager: Ether Segment not present or Encoded Value in Network Segment is invalid.
0x010318	Connection Manager: Link address to self invalid.
0x010319	Connection Manager: Resources on Secondary unavailable.
0x01031a	Connection Manager: Connection already established.
0x01031b	Connection Manager: Direct connection already established.
0x01031c	Connection Manager: Miscellaneous.
0x01031d	Connection Manager: Redundant connection mismatch.
0x01031e	Connection Manager: No more consumer resources available in the producing module.
0x01031f	Connection Manager: No connection resources exist for target path.
0x010320 - 0x0107ff	Connection Manager: Vendor specific.
0x020000	Resource unavailable: Connection Manager resources are unavailable to handle service request.
0x030000	Invalid parameter value.
0x040000	Path segment error: The path segment identifier or the segment syntax was not understood by the processing node.
0x050000	Path destination unknown: The path is referencing an object class, instance or structure element that is not known or is not contained in the processing node.
0x060000	Partial transfer: Only part of the expected data was transferred.
0x070000	Connection lost: The messaging connection was lost.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables ControlLogix, CompactLogix, & FlexLogix (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x080000	Service not supported: The requested service was not implemented or was not defined for this Object Class/ Instance.
0x090000	Invalid attribute value: Invalid attribute data detected.
0x0a0000	Attribute list error: An attribute in the Get_Attribute_List or Set_Attribute_List response has a non-zero status.
0x0b0000	Already in requested mode/state: The object is already in the mode/state being requested by the service.
0x0c0000	Object state conflict: The object cannot perform the requested service in its current mode/state.
0x0d0000	Object already exists: The requested instance of object to be created already exists.
0x0e0000	Attribute not settable: A request to modify non-modifiable attribute was received.
0x0f0000	Privilege violation: A permission/privilege check failed.
0x100000	Device state conflict: The device's current mode/state prohibits the execution of the requested service.
0x110000	Reply data too large: The data to be transmitted in the response buffer is larger than the allocated response buffer.
0x120000	Fragmentation of a primitive value: The service specified an operation that is going to fragment a primitive data value - for example, trying to send a 2 byte value to a REAL data type (4 byte).
0x130000	Not enough data: The service did not supply enough data to perform the specified operation.
0x140000	Attribute not supported: The attribute specified in the request is not supported.
0x150000	Too much data: The service supplied more data than was expected.
0x160000	Object does not exist: The object specified does not exist in the device.
0x170000	Service fragmentation sequence not in progress: The fragmentation sequence for this service is not currently active for this data.
0x180000	No stored attribute data: The attribute data of this object was no saved prior to the requested service.
0x190000	Store operation failure: The attribute data of this object was not saved due to a failure during the attempt.
0x1a0000	Routing failure, request packet too large: The service request packet was too large for transmission on a network in the path to the destination.
0x1b0000	Routing failure, response packet too large: The service reponse packet was too large for transmission on a network in the path from the destination.
0x1c0000	Missing attribute list entry data: The service did not supply an attribute in a list of attributes that was needed by the service to perform the requested behavior.
0x1d0000	Invalid attribute value list: The service is returning the list of attributes supplied with status information for those attributes that were invalid.
0x1e0000	Embedded service error: See Service Packet error list (PLC-498 Error codes) later in this appendix
0x1f0000	Vendor specific error: A vendor specific error has been encountered. This occurs when none of the specified errors relate to the error in the device.
0x200000	Invalid parameter: A parameter associated with the request was invalid. This code is used when a parameter does meet the requirements defined in an Application Object specification.
0x210000	Write-once value or medium already written: An attempt was made to write to a write-once-medium that has already been written or to modify a value that cannot be change once established.
0x220000	Invalid Reply Received: An invalid reply is received (example: service code sent doesn't match service code received).

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

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Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables ControlLogix, CompactLogix, & FlexLogix (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x230000	Reserved by CIP for future extensions.
0x240000	Reserved by CIP for future extensions.
0x250000	Key failure in path: The key segment was included as the first segment in the path does not match the destination module. The object specific status shall indicate which part of the key check failed.
0x260000	Path Size Invalid: The size of the path which was sent with the Service Request is either not large enough to allow the Request to be routed to an object or too much routing data was included.
0x270000	Unexpected attribute in list: An attempt was made to set an attribute that is not able to be set at this time.
0x280000	Invalid Member ID: The Member ID specified in the request does not exist in the specified Class/Instance/Attribute.
0x290000	Member not settable: A request to modify a non-modifiable member was received.
0x2a0000	Group 2 only server general failure: This error code may only be reported by DeviceNet group 2 only servers with 4K or less code space and only in place of Service not supported, Attribute not supported and Attribute not settable.
0x2b0000 - 0xcf0000	Reserved by CIP for future extensions.
0xd00000 - 0xff0000	Reserved for Object Class and service errors: This range of error codes is to be used to indicate Object Class specific errors. Use of this range should only be used when errors in this table don't accurately reflect the error encountered.

PLC Errors for Allen-Bradley EtherNet/IP Protocol – Service Packet Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-498 Hex Value	**Description**
0x040000	This general status codes that the tag name could not be deciphered. This could mean that the tag name was entered incorrectly or does not exist in the PLC.
0x050000	The particular item referenced (usually instance) could not be found.
0x060000	The amount of data requested would not fit into the response buffer. Partial data transfer has occurred.
0x0a0000	An error has occurred trying to process one of the attributes.
0x130000	Not enough command data/parameters were supplied in the command to execute the service requested.
0x1c0000	An insufficient number of attributes were provided compared to the attribute count.
0x260000	The tag name length specified did not match what was in the message.
0xff0521	You have tried to access beyond the end of the data object.
0xff0721	The abbreviated type does not match the data type of the data object.
0xff0421	The beginning offset was beyond the end of the template.

Allen-Bradley – Micro800 Serial and EtherNet/IP Tag Based PLC Error Code Tables

The following PLC error code tables cover possible errors that are detected by the panel from Allen-Bradley Micro800 PLCs using the tag based serial or EtherNet/IP protocols.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-496 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Errors for Allen-Bradley EtherNet/IP Protocol –Encapsulation Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-496 Hex Value	**Description**
0x00000001	The sender issued an invalid or unsupported encapsulation command.
0x00000002	Insufficient memory resources in the receiver to handle the command. You can get this error if the 1761-NET-ENI cannot connect to the PLC serially.
0x00000003	Poorly formed or incorrect data in the data portion of the encapsulation message.
0x00000004 - 0x00000063	Reserved for legacy (Rockwell Automation).
0x00000064	An orginator used an invalid session handle when sending an encapsulation message to the target.
0x00000065	The target received a message of invalid length.
0x00000066 - 0x00000068	Reserved for legacy (Rockwell Automation).
0x00000069	Unsupported encapsulation protocol revision.
0x0000006a - 0x0000ffff	Reserved for future expansion.

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010100	Connection Manager: Connection in Use or Duplicate Forward Open.
0x010103	Connection Manager: Transport Class and Trigger combination not supported.
0x010106	Connection Manager: Ownership Conflict.
0x010107	Connection Manager: Connection not found at target application.
0x010108	Connection Manager: Invalid connection type (problem with type or priority).
0x010109	Connection Manager: Invalid connection size.
0x010110	Connection Manager: Device not configured.
0x010111	Connection Manager: RPI not supported. Could also be problem with inactivity timeout.
0x010113	Connection Manager: Connection Manager cannot support any more connections.
0x010114	Connection Manager: Either the vendor ID or the Product Code in the key segment did not match the device.
0x010115	Connection Manager: Product Type in the key segment did not match the device.
0x010116	Connection Manager: Major or minor revision information in the key segment did not match the device.

(PLC generated error codes for the Allen-Bradley Micro800 Serial and EtherNet/IP Tag Based PLC continued on the next page)

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Allen-Bradley – Micro800 Serial and EtherNet/IP Tag Based PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010117	Connection Manager: Invalid connection point.
0x010118	Connection Manager: Invalid configuration format.
0x010119	Connection Manager: Connection request fails since there is no controlling connection currently open.
0x01011a	Connection Manager: Target application cannot support any more connections.
0x01011b	Connection Manager: RPI is smaller than the Production Inhibit Time.
0x010203	Connection Manager: Connection cannot be closed since the connection has timed out.
0x010204	Connection Manager: Unconnected Send timed out waiting for a response.
0x010205	Connection Manager: Parameter error in Unconnected Send service.
0x010206	Connection Manager: Message too large for Unconnected message service.
0x010207	Connection Manager: Unconnected acknowledge without reply.
0x010301	Connection Manager: No buffer memory available.
0x010302	Connection Manager: Network Bandwidth not available for data.
0x010303	Connection Manager: No Tag filters available.
0x010304	Connection Manager: Not configured to send real-time data.
0x010311	Connection Manager: Port specified in Port segment not available.
0x010312	Connection Manager: Link address specified in port segment not available.
0x010315	Connection Manager: Invalid segment type or segment value in path.
0x010316	Connection Manager: Path and Connection not equal in close.
0x010317	Connection Manager: Ether Segment not present or Encoded Value in Network Segment is invalid.
0x010318	Connection Manager: Link address to self invalid.
0x010319	Connection Manager: Resources on Secondary unavailable.
0x01031a	Connection Manager: Connection already established.
0x01031b	Connection Manager: Direct connection already established.
0x01031c	Connection Manager: Miscellaneous.
0x01031d	Connection Manager: Redundant connection mismatch.
0x01031e	Connection Manager: No more consumer resources available in the producing module.
0x01031f	Connection Manager: No connection resources exist for target path.
0x010320 - 0x0107ff	Connection Manager: Vendor specific.
0x020000	Resource unavailable: Connection Manager resources are unavailable to handle service request.
0x030000	Invalid parameter value.
0x040000	Path segment error: The path segment identifier or the segment syntax was not understood by the processing node.
0x050000	Path destination unknown: The path is referencing an object class, instance or structure element that is not known or is not contained in the processing node.
0x060000	Partial transfer: Only part of the expected data was transferred.
0x070000	Connection lost: The messaging connection was lost.

(PLC generated error codes for the Allen-Bradley Micro800 Serial and EtherNet/IP Tag Based PLC continued on the next page)

Allen-Bradley – Micro800 Serial and EtherNet/IP Tag Based PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x080000	Service not supported: The requested service was not implemented or was not defined for this Object Class/ Instance.
0x090000	Invalid attribute value: Invalid attribute data detected.
0x0a0000	Attribute list error: An attribute in the Get_Attribute_List or Set_Attribute_List response has a non-zero status.
0x0b0000	Already in requested mode/state: The object is already in the mode/state being requested by the service.
0x0c0000	Object state conflict: The object cannot perform the requested service in its current mode/state.
0x0d0000	Object already exists: The requested instance of object to be created already exists.
0x0e0000	Attribute not settable: A request to modify non-modifiable attribute was received.
0x0f0000	Privilege violation: A permission/privilege check failed.
0x100000	Device state conflict: The device's current mode/state prohibits the execution of the requested service.
0x110000	Reply data too large: The data to be transmitted in the response buffer is larger than the allocated response buffer.
0x120000	Fragmentation of a primitive value: The service specified an operation that is going to fragment a primitive data value - for example, trying to send a 2 byte value to a REAL data type (4 byte).
0x130000	Not enough data: The service did not supply enough data to perform the specified operation.
0x140000	Attribute not supported: The attribute specified in the request is not supported.
0x150000	Too much data: The service supplied more data than was expected.
0x160000	Object does not exist: The object specified does not exist in the device.
0x170000	Service fragmentation sequence not in progress: The fragmentation sequence for this service is not currently active for this data.
0x180000	No stored attribute data: The attribute data of this object was no saved prior to the requested service.
0x190000	Store operation failure: The attribute data of this object was not saved due to a failure during the attempt.
0x1a0000	Routing failure, request packet too large: The service request packet was too large for transmission on a network in the path to the destination.
0x1b0000	Routing failure, response packet too large: The service reponse packet was too large for transmission on a network in the path from the destination.
0x1c0000	Missing attribute list entry data: The service did not supply an attribute in a list of attributes that was needed by the service to perform the requested behavior.
0x1d0000	Invalid attribute value list: The service is returning the list of attributes supplied with status information for those attributes that were invalid.
0x1e0000	Embedded service error: See Service Packet error list (PLC-498 Error codes) later in this appendix
0x1f0000	Vendor specific error: A vendor specific error has been encountered. This occurs when none of the specified errors relate to the error in the device.
0x200000	Invalid parameter: A parameter associated with the request was invalid. This code is used when a parameter does meet the requirements defined in an Application Object specification.
0x210000	Write-once value or medium already written: An attempt was made to write to a write-once-medium that has already been written or to modify a value that cannot be change once established.
0x220000	Invalid Reply Received: An invalid reply is received (example: service code sent doesn't match service code received).

(PLC generated error codes for the Allen-Bradley Micro800 Serial and EtherNet/IP Tag Based PLC continued on the next page)

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Allen-Bradley – Micro800 Serial and EtherNet/IP Tag Based PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x230000	Reserved by CIP for future extensions.
0x240000	Reserved by CIP for future extensions.
0x250000	Key failure in path: The key segment was included as the first segment in the path does not match the destination module. The object specific status shall indicate which part of the key check failed.
0x260000	Path Size Invalid: The size of the path which was sent with the Service Request is either not large enough to allow the Request to be routed to an object or too much routing data was included.
0x270000	Unexpected attribute in list: An attempt was made to set an attribute that is not able to be set at this time.
0x280000	Invalid Member ID: The Member ID specified in the request does not exist in the specified Class/Instance/Attribute.
0x290000	Member not settable: A request to modify a non-modifiable member was received.
0x2a0000	Group 2 only server general failure: This error code may only be reported by DeviceNet group 2 only servers with 4K or less code space and only in place of Service not supported, Attribute not supported and Attribute not settable.
0x2b0000 - 0xcf0000	Reserved by CIP for future extensions.
0xd00000 - 0xff0000	Reserved for Object Class and service errors: This range of error codes is to be used to indicate Object Class specific errors. Use of this range should only be used when errors in this table don't accurately reflect the error encountered.

PLC Errors for Allen-Bradley EtherNet/IP Protocol – Service Packet Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-498 Hex Value	**Description**
0x040000	This general status codes that the tag name could not be deciphered. This could mean that the tag name was entered incorrectly or does not exist in the PLC.
0x050000	The particular item referenced (usually instance) could not be found.
0x060000	The amount of data requested would not fit into the response buffer. Partial data transfer has occurred.
0x0a0000	An error has occurred trying to process one of the attributes.
0x130000	Not enough command data/parameters were supplied in the command to execute the service requested.
0x1c0000	An insufficient number of attributes were provided compared to the attribute count.
0x260000	The tag name length specified did not match what was in the message.
0xff0521	You have tried to access beyond the end of the data object.
0xff0721	The abbreviated type does not match the data type of the data object.
0xff0421	The beginning offset was beyond the end of the template.

Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI

The following PLC error code tables cover possible errors that are detected by the panel from Allen-Bradley PLCs using the EtherNet/IP protocol. This includes MicroLogix 1100, 1400 & SLC 5/05, both using their native Ethernet port, and MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5/03, 5/04 and 5/05 using an Allen-Bradly ENI Adapter.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-496 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Errors for Allen-Bradley EtherNet/IP Protocol –Encapsulation Errors (Error code 0xaaaaaaaa returned from the PLC)	
Panel Error Code PLC-496 Hex Value	**Description**
0x00000001	The sender issued an invalid or unsupported encapsulation command.
0x00000002	Insufficient memory resources in the receiver to handle the command. You can get this error if the 1761-NET-ENI cannot connect to the PLC serially.
0x00000003	Poorly formed or incorrect data in the data portion of the encapsulation message.
0x00000004 - 0x00000063	Reserved for legacy (Rockwell Automation).
0x00000064	An orginator used an invalid session handle when sending an encapsulation message to the target.
0x00000065	The target received a message of invalid length.
0x00000066 - 0x00000068	Reserved for legacy (Rockwell Automation).
0x00000069	Unsupported encapsulation protocol revision.
0x0000006a - 0x0000ffff	Reserved for future expansion.

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010100	Connection Manager: Connection in Use or Duplicate Forward Open.
0x010103	Connection Manager: Transport Class and Trigger combination not supported.
0x010106	Connection Manager: Ownership Conflict.
0x010107	Connection Manager: Connection not found at target application.
0x010108	Connection Manager: Invalid connection type (problem with type or priority).
0x010109	Connection Manager: Invalid connection size.
0x010110	Connection Manager: Device not configured.
0x010111	Connection Manager: RPI not supported. Could also be problem with inactivity timeout.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

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Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x010113	Connection Manager: Connection Manager cannot support any more connections.
0x010114	Connection Manager: Either the vendor ID or the Product Code in the key segment did not match the device.
0x010115	Connection Manager: Product Type in the key segment did not match the device.
0x010116	Connection Manager: Major or minor revision information in the key segment did not match the device.
0x010117	Connection Manager: Invalid connection point.
0x010118	Connection Manager: Invalid configuration format.
0x010119	Connection Manager: Connection request fails since there is no controlling connection currently open.
0x01011a	Connection Manager: Target application cannot support any more connections.
0x01011b	Connection Manager: RPI is smaller than the Production Inhibit Time.
0x010203	Connection Manager: Connection cannot be closed since the connection has timed out.
0x010204	Connection Manager: Unconnected Send timed out waiting for a response.
0x010205	Connection Manager: Parameter error in Unconnected Send service.
0x010206	Connection Manager: Message too large for Unconnected message service.
0x010207	Connection Manager: Unconnected acknowledge without reply.
0x010301	Connection Manager: No buffer memory available.
0x010302	Connection Manager: Network Bandwidth not available for data.
0x010303	Connection Manager: No Tag filters available.
0x010304	Connection Manager: Not configured to send real-time data.
0x010311	Connection Manager: Port specified in Port segment not available.
0x010312	Connection Manager: Link address specified in port segment not available.
0x010315	Connection Manager: invalid segment type or segment value in path.
0x010316	Connection Manager: Path and Connection not equal in close.
0x010317	Connection Manager: Ether Segment not present or Encoded Value in Network Segment is invalid.
0x010318	Connection Manager: Link address to self invalid.
0x010319	Connection Manager: Resources on Secondary unavailable.
0x01031a	Connection Manager: Connection already established.
0x01031b	Connection Manager: Direct connection already established.
0x01031c	Connection Manager: Miscellaneous.
0x01031d	Connection Manager: Redundant connection mismatch.
0x01031e	Connection Manager: No more consumer resources available in the producing module.
0x01031f	Connection Manager: No connection resources exist for target path.
0x010320 - 0x0107ff	Connection Manager: Vendor specific.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x020000	Resource unavailable: Connection Manager resources are unavailable to handle service request.
0x030000	Invalid parameter value.
0x040000	Path segment error: The path segment identifier or the segment syntax was not understood by the processing node.
0x050000	Path destination unknown: The path is referencing an object class, instance or structure element that is not known or is not contained in the processing node.
0x060000	Partial transfer: Only part of the expected data was transferred.
0x070000	Connection lost: The messaging connection was lost.
0x080000	Service not supported: The requested service was not implemented or was not defined for this Object Class/ Instance.
0x090000	Invalid attribute value: Invalid attribute data detected.
0x0a0000	Attribute list error: An attribute in the Get_Attribute_List or Set_Attribute_List response has a non-zero status.
0x0b0000	Already in requested mode/state: The object is already in the mode/state being requested by the service.
0x0c0000	Object state conflict: The object cannot perform the requested service in its current mode/state.
0x0d0000	Object already exists: The requested instance of object to be created already exists.
0x0e0000	Attribute not settable: A request to modify non-modifiable attribute was received.
0x0f0000	Privilege violation: A permission/privilege check failed.
0x100000	Device state conflict: The device's current mode/state prohibits the execution of the requested service.
0x110000	Reply data too large: The data to be transmitted in the response buffer is larger than the allocated response buffer.
0x120000	Fragmentation of a primitive value: The service specified an operation that is going to fragment a primitive data value - for example, trying to send a 2 byte value to a REAL data type (4 byte).
0x130000	Not enough data: The service did not supply enough data to perform the specified operation.
0x140000	Attribute not supported: The attribute specified in the request is not supported.
0x150000	Too much data: The service supplied more data than was expected.
0x160000	Object does not exist: The object specified does not exist in the device.
0x170000	Service fragmentation sequence not in progress: The fragmentation sequence for this service is not currently active for this data.
0x180000	No stored attribute data: The attribute data of this object was no saved prior to the requested service.
0x190000	Store operation failure: The attribute data of this object was not saved due to a failure during the attempt.
0x1a0000	Routing failure, request packet too large: The service request packet was too large for transmission on a network in the path to the destination.
0x1b0000	Routing failure, response packet too large: The service reponse packet was too large for transmission on a network in the path from the destination.
0x1c0000	Missing attribute list entry data: The service did not supply an attribute in a list of attributes that was needed by the service to perform the requested behavior.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

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Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – CIP Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-497 Hex Value	**Description**
0x1d0000	Invalid attribute value list: The service is returning the list of attributes supplied with status information for those attributes that were invalid.
0x1e0000	Embedded service error: See Service Packet error list (PLC-498 Error codes) later in this appendix
0x1f0000	Vendor specific error: A vendor specific error has been encountered. This occurs when none of the specified errors relate to the error in the device.
0x200000	Invalid parameter: A parameter associated with the request was invalid. This code is used when a parameter does meet the requirements defined in an Application Object specification.
0x210000	Write-once value or medium already written: An attempt was made to write to a write-once-medium that has already been written or to modify a value that cannot be change once established.
0x220000	Invalid Reply Received: An invalid reply is received (example: service code sent doesn't match service code received.).
0x230000	Reserved by CIP for future extensions.
0x240000	Reserved by CIP for future extensions.
0x250000	Key failure in path: The key segment which was included as the first segment in the path does not match the destination module. The object specific status shall indicate which part of the key check failed.
0x260000	Path Size Invalid: The size of the path which was sent with the Service Request is either not large enough to allow the Request to be routed to an object or too much routing data was included.
0x270000	Unexpected attribute in list: An attempt was made to set an attribute that is not able to be set at this time.
0x280000	Invalid Member ID: The Member ID specified in the request does not exist in the specified Class/Instance/Attribute.
0x290000	Member not settable: A request to modify a non-modifiable member was received.
0x2a0000	Group 2 only server general failure: This error code may only be reported by DeviceNet group 2 only servers with 4K or less code space and only in place of Service not supported, Attribute not supported and Attribute not settable.
0x2b0000 - 0xcf0000	Reserved by CIP for future extensions.
0xd00000 - 0xff0000	Reserved for Object Class and service errors: This range of error codes is to be used to indicate Object Class specific errors. Use of this range should only be used when errors in this table don't accurately reflect the error encountered.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – Service Packet Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-498 Hex Value	**Description**
0x010000	DST Node is out of buffer space.
0x020000	Cannot guarantee delivery; link layer (the remote node specified does not ACK command).
0x030000	Duplicate token holder detected.
0x040000	Local port is disconnected.
0x050000	Application layer timed out waiting for response.
0x060000	Duplicate node detected.
0x070000	Station is offline.
0x080000	Hardware fault.
0x100000	Illegal command or format. Typical error received from PLC when address requested to the PLC does not exist. Usually occurs if memory map has not been expanded in PLC to the range requested from panel.
0x200000	Host has a problem and will not communicate.
0x300000	Remote node host is missing, disconnected, or shut down.
0x400000	Host could not complete function due to hardware fault.
0x500000	Addressing problem or memory protected rungs.
0x600000	Function not allowed due to command protection selection.
0x700000	Processor is in Program Mode.
0x800000	Compatibility mode file missing or communication zone problem.
0x900000	Remote node cannot buffer command.
0xA00000	Wait ACK (1775 KA buffer full).
0xB00000	not used
0xC00000	not used
0xD00000	Error code in the EXT STS byte. See the error code table below.
0xE00000	Fewer levels specified in address than minimum for any address.
0xF00300	More levels specified in address than system supports.
0xF00400	Symbol not found.
0xF00500	Symbol is of improper format.
0xF00600	Address does not point to something usable.
0xF00700	File is wrong size.
0xF00800	Cannot complete request, situation has changed since start of the command.
0xF00900	Data or file size is too large.
0xF00900	Transaction size plus word address is too large.
0xF00B00	Access denied; improper privilege. This will occur if data file is set to constant or protected.
0xF00C00	Condition cannot be generated; resource is not available.
0xF00D00	Condition already exists; resource is readily available.

(PLC generated error codes for the Allen-Bradley EtherNet/IP protocol continued on the next page)

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Allen-Bradley – EtherNet/IP Protocol – PLC Error Code Tables SLC, MicroLogix and ENI (cont'd)

PLC Errors for Allen-Bradley EtherNet/IP Protocol – Service Packet Errors (Error code 0xaabbbb returned from the PLC)	
Panel Error Code PLC-498 Hex Value	**Description**
0xF00E00	Command cannot be executed.
0xF00F00	Histogram overflow.
0xF01000	No access.
0xF01100	Illegal data type.
0xF01200	Invalid parameter or invalid data.
0xF01300	Address reference exists to deleted area.
0xF01400	Command execution failure for unknown reason; possible histogram overflow.
0xF01500	Data conversion error.
0xF01600	Scanner not able to communicate with 1771 rack adapter.
0xF01700	Type mismatch.
0xF01800	1771 module response was not valid.
0xF01900	Duplicated label.
0xF02200	Remote rack fault.
0xF02300	Timeout.
0xF02400	Unknown error.
0xF01A00	File is open; another node owns it.
0xF01B00	Another node is the program owner.
0xF01C00	Reserved.
0xF01D00	Reserved.
0xF01E00	Data table element protection violation.
0xF01F00	Temporary internal problem.

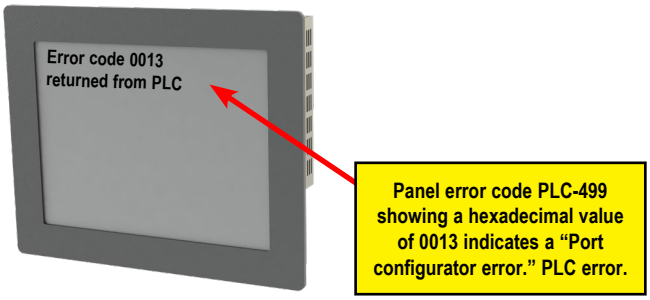
Generic EtherNet IP Protocol – PLC Error Codes

Only errors as listed in the HMI Error Code Table shown previously in this Appendix can occur when using the Generic Ethernet IP protocol. There are no PLC generated errors.

GE 90-30 – Panel Error Code PLC-499 Explanation

The PLC-499 error code is used to show any errors that are generated by the connected PLC. The PLC-499 error message includes a four digit hexadecimal value embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the GE 90-30 communication protocol are represented by a hexadecimal value as shown in the following message example.

GE 90-30 Error Code PLC-499 Message Example:



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GE 90-30 SNPX Protocol – PLC Error Code Tables

The following table lists the errors that can be generated by the GE 90-30 PLC when using the SNPX protocol.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Errors for GE 90-30 SNPX Protocol (Major)	
Panel Error Code PLC-499 Hex Value	**Description**
No error	Successful completion. (This is the expected completion value in the COMMREQ Status Word.)
0x0002	Insufficient Privilege. For Series 90-70 PLC, the minor error code contains the privilege level required for the service request.
0x0004	Protocol Sequence Error. The CPU has received a message that is out of order.
0x0005	Service Request Error, the minor error code contains the specific error code.
0x0006	Illegal Mailbox Type. Service request mailbox type is either undefined or unexpected.
0x0007	The PLC CPU's Service Request Queue is full. The master should retry later. It is recommended that the master wait a minimum of 10 msec before sending another service request.
0x000A	SNP DOS Driver Error. The minor error code contains the specific error code.
0x000B	Illegal Service Request. The requested service is either not defined or not supported. (This value is returned in lieu of the actual 01h value passed in the SNP error message, to avoid confusion with the normal successful COMMREQ completion.)
0x000C	Local SNP/SNP-X Error. An error occurred within the SNP task in the CMM module in this PLC. This error may occur in either an SNP master or an SNP slave. The minor error code contains the specific error code.
0x000D	Remote SNP Error. An error occurred within the SNP slave task in the CMM module in the remote PLC. The minor error code contains the specific error code.
0x000E	Autodial Error. An error occurred while attempting to send a command string to an attached external modem. The minor error code contains the specific error code.
0x000F	SNP-X slave error. An error occurred within the SNPX task in the remote slave device. The minor error code contains the specific error code.
0x0013	Port configurator error.
0x0050	Problem with sending mail to the slave Service Request task. (Series 90-70 PLC CPUs only)
0x0051	Problem with getting mail from the slave Service Request task. (Series 90-70 PLC CPUs only)
0x0055	Slave SNP task timed out before receiving an SRP response. (Series 90-70 PLC CPUs only)
0x0056	Slave SNP task could not find the requested datagram connection. (Series 90-70 PLC CPUs only)
0x0057	Slave SNP task encountered an error in trying to write the datagram. (Series 90-70 PLC CPUs only)
0x0058	Slave SNP task encountered an error in trying to update the datagram. (Series 90-70 PLC CPUs only)

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
PLC Error 0x010C	WAIT-type COMMREQ is not permitted; must use NOW AIT-type.
PLC Error 0x010E	not used
PLC Error 0x010F	The service request code in an X-Request message is unsupported or invalid at this time. This error may occur if an SNP-X communication session has not been success fully established at the slave device.
PLC Error 0x020C	COMMREQ command is not supported.
PLC Error 0x020E	The modem command string length exceeds 250 characters.
PLC Error 0x020F	Insufficient privilege level in the slave PLC CPU for the requested SNP-X service. Password protection at PLC CPU may be preventing the requested service.
PLC Error 0x0213	Unsupported COMMREQ. These errors are only generated when there is no protocol currently being run on a port, and the port receives a COMMREQ. (The port may be disabled or an error has occurred in processing a new configuration).
PLC Error 0x030C	SNP communication is not active. Must initiate a new SNP communication by sending an Attach or Long Attach COMMREQ.
PLC Error 0x030E	COMMREQ Data Block Length is too small. Output command string data is missing or incomplete.
PLC Error 0x030F	Invalid slave memory type in X-Request message.
PLC Error 0x0313	Invalid COMMREQ length.
PLC Error 0x040C	SNP slave did not respond to Attach message from master.
PLC Error 0x040E	Serial output timeout. The CMM module was unable to transmit the modem autodial output from the serial port. (May be due to missing CTS signal when the CMM is configured to use hardware flow control.)
PLC Error 0x040F	Invalid slave memory address or range in X-Request message.
PLC Error 0x0413	Invalid COMMREQ status word location.
PLC Error 0x050C	Unable to write SNP Status Word to local PLC memory. May be due to invalid Status Word memory type or address.
PLC Error 0x050E	Response was not received from modem. Check modem and cable.
PLC Error 0x050F	Invalid data length in X-Request message. Data length must be non-zero, and may not exceed decimal 1000 bytes.
PLC Error 0x0513	Invalid COMMREQ data.
PLC Error 0x060C	Master device memory type is not valid in this PLC.
PLC Error 0x060E	Modem responded with BUSY. Modem is unable to complete the requested connection. The remote modem is already in use; retry the connection request at a later time.
PLC Error 0x060F	X-Buffer data length does not match the service request in X-Request message. The X-Buffer message length is obtained from the Next Message Length field in the X-Request message; the length of the data within the buffer message is always the message length.
PLC Error 0x070C	Master device memory address or length is zero.
PLC Error 0x070E	Modem responded with NO CARRIER. Modem is unable to complete the requested connection. Check the local and remote modems and the telephone line.
PLC Error 0x070F	Queue Full indication from Service Request Processor in slave PLC CPU. The slave is temporarily unable to complete the service request. The master should try again later. It is recommended that the master wait at least 10 msec before repeating the X-Request.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

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GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x080C	Unable to read or write master device memory locations specified in COMMREQ. Usually caused by invalid memory address for this PLC. SNP message exchange may have taken place.
0x080E	Modem responded with NO DIALTONE. Modem is unable to complete the requested connection. Check the modem connections and the telephone line.
0x080F	Service Request Processor response exceeds 1000 bytes; the SNP-X slave device cannot return the data in an X-Response message. (This error applies to CMM module only.)
0x090C	Master device memory data length exceeds maximum data size of CMM module (2048 bytes). Must use a smaller data length. Use multiple COMMREQs if total data length exceeds this maximum value.
0x090E	Modem responded with ERROR. Modem is unable to complete the requested command. Check the modem command string and modem.
0x0A0C	Slave device memory type is missing or not valid.
0x0A0E	Modem responded with RING, indicating that the modem is being called by another modem. Modem is unable to complete the requested command. Retry the modem command at a later time.
0x0B0C	Slave device memory address is missing or zero.
0x0B0E	An unknown response was received from the modem. Modem is unable to complete the requested command. Check the modem command string and modem. The modem response is expected to be either CONNECT or OK.
0x0C0C	COMMREQ Data Block Length is too small. (When expected COMMREQ length is 6 words or less. An improper length may cause other minor error codes 6-11.)
0x0D0C	Invalid Diagnostic Status Word (DSW) starting word or length.
0x0E0C	Invalid maximum SNP message data size. Must be an even value from 42 to 2048.
0x0F0C	Invalid Privilege Level. Must be 0 through 4 or -1.
0x100C	Invalid Fault Table selector. Must be 1 for I/O Fault Table, or 2 for PLC Fault Table.
0x100F	Unexpected Service Request Processor error. (This error applies to CMM module only; the unexpected SRP error code is saved in the Diagnostic Status Words in the CMM module.)
0x110C	Invalid Fault Table starting index. Must be 1-32 for I/O Fault Table, or 1-16 for PLC.
0x120C	Invalid fault count. Must be 1-32 for I/O Fault Table, or 1-16 for PLC Fault Table.
0x130C	Invalid Set PLC Date/Time mode. Must be 1-4.
0x140C	Invalid Set PLC Date/Time date, time, or day-of-week value.
0x150C	Unable to retrieve master device PLC time/date from PLC CPU.
0x150F	Requested service is not permitted in a Broadcast request. The master must direct the X-Request message to a specific SNP-X slave device.
0x160C	Invalid slave PLC type. Must be 0 for Series 90-70, or 1 for Series 90-30 or Series 90-20.
0x170C	Invalid datagram type. Must be 01h for normal datagram, or 81h (129) for permanent datagram.
0x180C	Missing or too many datagram point formats. Must be 1-32.
0x190C	Invalid datagram point format data.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x1A0C	Datagram area size is too small to include data for all specified point formats.
0x1B0C	Invalid number of Control Program Names. Must be 1-8.
0x1C0C	SNP-X Request exceeds maximum data size (1000 bytes). Must use a smaller data length. Use multiple COMMREQs if necessary.
0x1D0C	Invalid SNP-X communication session type. Must be 0 for a single slave device, or 1 for multiple slave devices.
0x1E0C	Illegal destination SNP ID specified for SNP-X slave. Must be 0-7 ASCII characters, plus a terminating null character (00h). The Null SNP ID (eight bytes of 00h) may be used to specify any single device. The Broadcast SNP ID (eight bytes of FFh) may be use to specify all slave devices on the serial link.
0x1F0C	Destination SNP ID does not match SNP-X session type. The Broadcast SNP ID is not permitted in a single-slave SNP-X session. The Null SNP ID is not permitted in a multiple-slave SNP-X session.
0x200C	Inactivity timeout (T3'). The SNP slave has not received any new SNP messages within the configured T3' time interval.
0x200F	Invalid Message Type field in a received X-Request message. The message type of an X-Request message must be 58h = "X."
0x210C	A Parity error has occurred on an Attach, Attach Response, or Update Real–time Datagram message. Communications have not been established.
0x210F	Invalid Next Message Type or Next Message Length field in a received X Request message. If this request does not use a buffer (0-2 bytes of data), the Next Message Type must be zero. If this request will be followed with a buffer message (more than 2 byte.), the Next Message Type must be 54h = "T," and the Next Message Length must specify the length of the X-Buffer message. Valid X-Buffer message lengths are 9-1008 bytes (data length plus 8 bytes).
0x220C	A BCC (Block Check Code) error has occurred on an Attach, Attach Response, or Update Realtime Datagram message. Communications have not been established.
0x220F	Invalid Message Type field in a received X-Buffer message. The message type of an X-Buffer message must be 54h = "T."
0x230C	A Framing or Overrun serial error has occurred on an Attach, Attach Response, or Update Realtime Datagram message. Communications have not been established.
0x230F	Invalid Next Message Type field in a received X-Buffer message. Since an X-Buffer message is never followed by another message, the Next Message Type must always be zero.
0x240C	An invalid SNP message type was received when an Attach, Attach Response, or Update Realtime Datagram message was required. Communications have not been established.
0x250C	An invalid next message length value was specified in an Attach, Attach Response, or Update Realtime Datagram message. Communications have not been established.
0x260C	An unexpected SNP message type was received when an Attach, Attach Response, or Update Realtime Datagram was required. Communications have not been established.
0x270C	Another Break was received while SNP slave was waiting for an Attach or Update Realtime Datagram message.
0x280C	An SNP message has been sent and retried the maximum number of times. A maximum of two retries are permitted. A retry is caused by a NAK from from the remote SNP device.
0x290C	A received SNP message has been NAK-ed the maximum number of two times. The NAK-ed message may be retransmitted a maximum of two times.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

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GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x2A0C	An unknown message was received when an acknowledge (ACK or NAK) was required.
0x2B0C	Sequence Error. An unexpected SNP message type was received.
0x2C0C	Received SNP message contains bad next message length value.
0x2D0C	Acknowledge timeout. An acknowledge (ACK or NAK) was not received within the configured T2 time interval. A slave device may generate this error if the master device has aborted after maximum response NAKs and does not NAK the next response retry.
0x2E0C	Response timeout. The SNP Master did not receive an SNP Response message within the configured T5" time interval.
0x2F0C	Buffer message timeout. An expected Text Buffer or Connection Data message was not received within the configured T5" time interval.
0x300C	Serial output timeout. The CMM module was unable to transmit a Break, an SNP message, or SNP acknowledge (ACK or NAK) from the serial port. (May be due to missing CTS signal when the CMM module is configured to use hardware flow control.)
0x310C	SNP slave did not receive a response from the Service Request Processor in the PLC CPU.
0x320C	COMMREQ timeout. The COMMREQ did not complete within the configured time interval.
0x330C	An SNP Request or Response was aborted prior to completion due to reception of a Break.
0x340C	PLC backplane communications error.
0x350C	Invalid Piggyback Status data memory type or address. Communications have not been established.
0x360C	Invalid SNP Slave SNP ID. Must be a 0-7 ASCII characters, plus a terminating null character (00h). The Null SNP ID (eight bytes of 00h) may be used to specify any single slave device.
0x370C	The SNP master has received a response message containing an unexpected data length. Usually indicates a problem with the remote SNP slave device. May occur when Series 90-70 commands (Task Memory or Program Block Memory Read/Write) are issued to a Series 90-30 slave device.
0x380C	Response code in received SNP-X response message does not match expected value. (Response code must equal the request code +80h.)
0x390C	SNP-X Response message exceeds maximum data size (decimal 1000 bytes). Data in the Response is ignored.
0x400C	A parity error has occurred on an X-Attach Response message when establishing a new SNP-X communication session. Communications have not been established.
0x400D	The requested service is not supported by the SNP slave.
0x400F	Serial output timeout. The slave was unable to transmit an SNP-X message from the serial port. (May be due to missing CTS signal when the CMM module is configured to use hardware flow control.)

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x410C	A framing or overrun error has occurred on an X-Attach Response message when establishing a new SNP-X communication session. Communications have not been established.
0x410D	SNP slave on CMM module requires PLC CPU privilege level 2 to operate. The SNP slave has rejected a request to change to a higher or lower privilege level.
0x410F	An SNP-X request was aborted prior to completion due to reception of a Break.
0x420C	A BCC (Block Check Code) error has occurred on an X-Attach Response message when establishing a new SNP-X communication session. Communications have not been established.
0x420D	SNP Request or Response message exceeds maximum data length of the CMM module. (Total data length for Mailbox and all following Buffer messages is 2048 bytes.) The master must use a smaller data length. Use multiple requests if total data length exceeds the maximum value.
0x420F	An X-Buffer message was received containing greater than 1000 bytes of data. The data is ignored.
0x430C	An invalid message type was received when an X-Attach Response was required when establishing a new SNP-X communication session. Communications have not been established.
0x430D	Improper Write Datagram message format. Series 90-70 slave devices use a different format for this message than Series 90-30 or Series 90-20 slave devices. The master must use the proper message format for this SNP slave device. (The SNP master in the CMMmodule sends this message as part of the Establish Datagram COMMREQ command. The datagram has been partially established, but is not usable; the datagram should be cancelled by using the Datagram ID returned by the COMMREQ.)
0x430F	The SNP-X slave did not receive a response from the Service Request Processor in the PLC CPU.
0x440C	An invalid next message type value was detected in an X-Attach Response message when establishing a new SNP-X communication session. Communications have not been established.
0x440D	A datagram error occurred in a Series 90-70 slave device (dual-port error).
0x440F	PLC backplane communications error.
0x450C	An invalid response code was detected in an X-Attach Response message when establishing a new SNP-X communication session. Communications have not been established.
0x460C	An expected X-Attach Response message was not received within the response timeout interval when establishing a new SNP-X communication session. The master has retried the X-Attach message twice without receiving a response. Communications have not been established.
0x500C	A parity error has occurred on an X-Attach Response message when re-establishing an existing SNP-X communication session. Communications have not been established.
0x500F	A parity error has occurred in a received X-Attach message.
0x510C	A framing or overrun error has occurred on an X-Attach Response message when re-establishing an existing SNP-X communication session. Communications have not been established.
0x510F	A framing or overrun error has occurred in a received X-Attach message.
0x520C	A BCC (Block Check Code) error has occurred on an X-Attach Response message when re-establishing an existing SNP-X communication session. Communications have not been established.
0x520F	A BCC (Block Check Code) error has occurred in a received X-Attach message.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

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GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x530C	An invalid message type was received when an X-Attach Response was required when re-establishing an existing SNP-X communication session. Communications have not been established.
0x530F	An invalid Message Type was received when an X-Attach message was required. (For an X-Attach message, the message type must be 58h = "T".)
0x540C	An invalid Next Message Type value was detected in an X-Attach Response message when re-establishing an existing SNP-X communication session. Communications have not been established.
0x540F	An invalid Next Message Type value was detected in a received X-Attach message. (For an X-Attach message, the Next Message Length must be zero.)
0x550C	An invalid response code was detected in an X-Attach Response message when re-establishing an existing SNP-X communication session. Communications have not been established.
0x550F	An invalid request code was detected in a received X-Attach message.
0x560C	An expected X-Attach Response message was not received within the response timeout interval when re-establishing an existing SNP-X communication session. The master has retried the X-Attach message twice without receiving a response. Communications have not been established.
0x600C	A parity error has occurred on an X-Response message.
0x600F	A parity error has occurred in a received X-Request message.
0x610C	A framing or overrun error has occurred on an X-Response message.
0x610F	A framing or overrun error has occurred in a received X-Request message.
0x620C	A BCC (Block Check Code) error has occurred on an X-Response message.
0x620F	A BCC (Block Check Code) error has occurred in a received X-Request message.
0x630C	An invalid message type was received when an X-Response message was required.
0x640C	An invalid next message type value was detected in an X-Response message.
0x650C	An invalid response code was detected in an X-Response message.
0x660C	An expected X-Response message was not received within the response time.
0x700C	A parity error has occurred on an Intermediate Response message.
0x700F	A parity error has occurred in a received X-Buffer message.
0x710C	A framing or overrun error has occurred on an Intermediate Response message.
0x710F	A framing or overrun error has occurred in a received X-Buffer message.
0x720C	A BCC (Block Check Code) error has occurred on an Intermediate Response message.
0x720F	A BCC(Block Check Code) error has occurred in a received X-Buffer message.
0x730C	An invalid message type was received when an Intermediate Response message was required.
0x730F	An expected X-Buffer message was not received.
0x740C	An invalid next message type value was detected in an Intermediate Response message.
0x750C	An invalid response code was detected in an Intermediate Response message.
0x760C	An expected Intermediate Response message was not received within the response timeout interval.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0x8D0A	Bad DOS Version. Must have DOS 2.0, or later, to support the SNP DOS Driver.
0x8E0A	PC Serial port configured for SNP Master driver is not open; no communication can take place.
0x8F0A	Out–of–Sequence SNP message. SNP message type received was not the type expected.
0x900A	Bad SNP BCC encountered. Transmission was aborted after maximum retries due to a bad Block Check Code.
0x910A	Bad SNP communication. Transmission was aborted after maximum retries due to serial errors (that is, parity, overrun, or framing errors).
0x920A	No SNP communication. Either communication has been lost or a communication session has not been established.
0xC105	Invalid block state transition.
0xC205	The OEM key is NULL (inactive).
0xC305	Text length does not match traffic type.
0xC405	Verify with FA Card or EEPROM failed.
0xC505	No task-level Rack/Slot configuration to read or delete.
0xC605	Control Program (CP) tasks exist but requestor not logged into main CP.
0xC705	Passwords are set to inactive and cannot be enabled or disabled.
0xC805	Password(s) already enabled and can not be forced inactive.
0xC905	Login using non-zero buffer size required for block commands.
0xCA05	Device is write-protected.
0xCB05	A comm or write verify error occurred during save or restore.
0xCC05	Data stored on device has been corrupted and is no longer reliable.
0xCD05	Attempt was made to read a device but no data has been stored on it.
0xCE05	Specified device has insufficient memory to handle request.
0xCF05	Specified device is not available in the system (not present).
0xD005	One or more PLC modules configured have unsupported revision.
0xD105	Packet size or total program size does not match input.
0xD205	Invalid write mode parameter.
0xD305	User Program Module (UPM) read or write exceeded block end.
0xD405	Mismatch of configuration checksum.
0xD505	Invalid block name specified in datagram.
0xD605	Total datagram connection memory exceeded.
0xD705	Invalid datagram type specified.
0xD805	Point length not allowed.
0xD905	Transfer type invalid for this Memory Type selector.
0xDA05	Null pointer to data in Memory Type selector.
0xDB05	Invalid Memory Type selector in datagram.
0xDC05	Unable to find connection address.
0xDD05	Unable to locate given datagram connection ID.
0xDE05	Size of datagram connection invalid.
0xDF05	Invalid datagram connection address.

(PLC generated error codes for the GE 90-30 SNPX protocol continued on the next page)

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GE 90-30 SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE 90-30 SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code PLC-499 Hex Value	**Description**
0xE005	Service in process cannot login.
0xE105	No I/O configuration to read or delete.
0xE205	IOS could not delete configuration, or bad type.
0xE305	CPU revision number does not match.
0xE405	Memory Type for this selector does not exist.
0xE505	DOS file area not formatted.
0xE605	CPU model number does not match.
0xE705	Configuration is not valid.
0xE805	No user memory is available to allocate.
0xE905	Memory Type selector not valid in context.
0xEA05	Not logged in to process service request.
0xEB05	Task unable to be deleted.
0xEC05	Task unable to be created.
0xED05	VME bus error encountered.
0xEE05	Could not return block sizes.
0xEF05	Programmer is already attached.
0xF005	Request only valid in stop mode.
0xF105	Request only valid from programmer.
0xF205	Invalid program cannot log in.
0xF305	I/O configuration mismatch.
0xF405	Invalid input parameter in request.
0xF505	Invalid password.
0xF605	Invalid sweep state to set.
0xF705	Required to log in to a task for service.
0xF805	Invalid Task Name referenced.
0xF905	Task address out of range.
0xFA05	Cannot replace I/O module.
0xFB05	Cannot clear I/O configuration.
0xFC05	I/O configuration is invalid.
0xFD05	Unable to perform auto configuration.
0xFE05	No privilege for attempted operation.
0xFF05	Service Request Error has been aborted.

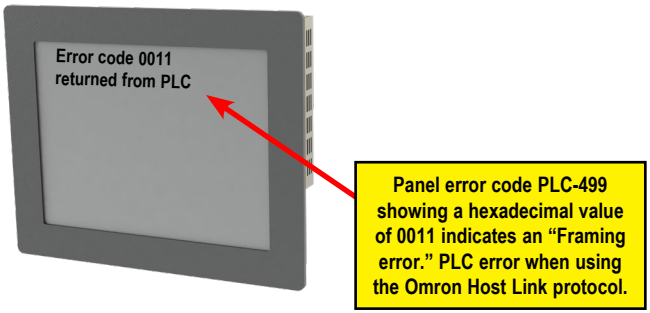
Mitsubishi FX Protocol – PLC Error Codes

Only errors as listed in the HMI Error Code Table shown previously in this Appendix can occur when using the Mitsubishi FX protocol. There are no PLC generated errors.

Omron – Panel Error Code PLC-499 Explanation

The PLC-499 error code is used to show any errors that are generated by the connected PLC. The PLC-499 error message includes a four digit hexadecimal value embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the Omron Host Link and FINS communication protocol are represented by a hexadecimal value as shown in the following message example.

Omron Error Code PLC-499 Message Example:



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Omron Host Link Protocol – PLC Error Code Table

The following table lists the errors that can be generated by the Omron PLC when using the Host Link protocol.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Error Codes for Omron Host Link	
Panel Error Code PLC-499 Hex Value	**Description**
0x0000	Normal Completion.
0x0001	Not executable in RUN mode.
0x0002	Not executable in MONITOR mode.
0x0003	Not executable with PROM mounted.
0x0004	Address over (data overflow).
0x000B	Not executable in PROGRAM mode.
0x000C	Not executable in DEBUG mode.
0x000D	Not executable in LOCAL mode.
0x0010	Parity error.
0x0011	Framing error.
0x0012	Overrun.
0x0013	FCS error.
0x0014	Format error (parameter length error).
0x0015	Entry number data error (parameter error, data code error, data length error).
0x0016	Instruction not found.
0x0018	Frame length error.
0x0019	Not executable (due to Un-executable error clear, non-registration of I/O table, etc.).
0x0020	I/O table generation impossible (unrecognized remote I/O unit, channel over, duplication of optical transmitting I/O unit).
0x00A0	Abort due to parity error in transmit data under process.
0x00A1	Abort due to framing error in transmit data under process.
0x00A2	Abort due to overrun in transmit data under process.
0x00A3	Abort due to FCS error in transmit data under process.
0x00A4	Abort due to format error in transmit data under process.
0x00A5	Abort due to frame length error in transmit data under process.
0x00A8	Abort due to entry number data error in transmit data under process.
0x00B0	Un-executable due to program area capacity other than 16k bytes.

Omron FINS Protocol – PLC Error Code Table

The following table lists the errors that can be generated by the Omron PLC when using the FINS protocol.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Error Codes for Omron FINS	
Panel Error Code PLC-499 Hex Value	**Description**
0x0000	Normal Completion.
0x0001	Service Canceled.
0x0101	Local Error: Local node not in network.
0x0102	Local Error: Token Timeout.
0x0103	Local Error: Retries Failed.
0x0104	Local Error: Too many send frames.
0x0105	Local Error: Node address range error.
0x0106	Local Error: Node Address Duplication.
0x0201	Destination Node Error: Destination Node not in network.
0x0202	Destination Node Error: Unit Missing.
0x0203	Destination Node Error: Third Node missing.
0x0204	Destination Node Error: Destination Node busy.
0x0205	Destination Node Error: Response Timeout.
0x0301	Controller Error: Communications Controller Error.
0x0302	Controller Error: CPU Unit Error.
0x0303	Controller Error: Controller Error.
0x0304	Controller Error: Unit number Error.
0x0401	Service Unsupported: Undefined Command.
0x0402	Service Unsupported: Not supported by Model/Version.
0x0501	Routing Table Error: Destination address setting error.
0x0502	Routing Table Error: No routing tables.
0x0503	Routing Table Error: Routing table error.
0x0504	Routing Table Error: Too many delays.
0x1001	Command Format Error: Command too long.
0x1002	Command Format Error: Command too short.
0x1003	Command Format Error: Elements/Data don't match.
0x1004	Command Format Error: Command format error.
0x1005	Command Format Error: Header Error.
0x1101	Parameter Error: Area classification missing.
0x1102	Parameter Error: Access Size Error.
0x1103	Parameter Error: Address range error.

(PLC generated error codes for the Omron FINS protocol continued on the next page)

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Omron FINS Protocol – PLC Error Code Table (cont'd)

PLC Error Codes for Omron FINS	
Panel Error Code PLC-499 Hex Value	**Description**
0x1104	Parameter Error: Address range exceeded.
0x1106	Parameter Error: Program Missing.
0x1109	Parameter Error: Relational Error.
0x110A	Parameter Error: Duplicate Data Access.
0x110B	Parameter Error: Response too long.
0x110C	Parameter Error: Parameter Error.
0x2002	Read Not Possible: Protected.
0x2003	Read Not Possible: Table missing.
0x2004	Read Not Possible: Data missing.
0x2005	Read Not Possible: Program missing.
0x2006	Read Not Possible: File missing.
0x2007	Read Not Possible: Data mismatch.
0x2101	Write Not Possible: Read Only.
0x2102	Write Not Possible: Protected – cannot write data link table.
0x2103	Write Not Possible: Cannot register.
0x2105	Write Not Possible: Program missing.
0x2106	Write Not Possible: File missing.
0x2107	Write Not Possible: File name already exists.
0x2108	Write Not Possible: Cannot change.
0x2201	Not executable in current mode: Not possible during execution.
0x2202	Not executable in current mode: Not possible while running.
0x2203	Not executable in current mode: Wrong PLC mode (Program).
0x2204	Not executable in current mode: Wrong PLC mode (Debug).
0x2205	Not executable in current mode: Wrong PLC mode (Monitor).
0x2206	Not executable in current mode: Wrong PLC mode (Run).
0x2207	Not executable in current mode: Specified node not polling node.
0x2208	Not executable in current mode: Step cannot be executed.
0x2301	No such device: File device missing.
0x2302	No such device: Missing memory.
0x2303	No such device: Clock missing.
0x2401	Cannot Start/Stop: Table missing.
0x2502	Unit Error: Memory Error.
0x2503	Unit Error: I/O setting Error.
0x2504	Unit Error: Too many I/O points.
0x2505	Unit Error: CPU bus error.
0x2506	Unit Error: I/O Duplication.

(PLC generated error codes for the Omron FINS protocol continued on the next page)

Omron FINS Protocol – PLC Error Code Table (cont'd)

PLC Error Codes for Omron FINS	
Panel Error Code PLC-499 Hex Value	**Description**
0x2507	Unit Error: I/O bus error.
0x2509	Unit Error: SYSMAC BUS/2 error.
0x250A	Unit Error: CPU Bus Unit Error.
0x250D	Unit Error: SYSMAC BUS No. duplication.
0x250F	Unit Error: Memory Error.
0x2510	Unit Error: SYSMAC BUS terminator missing.
0x2601	Command Error: No protection.
0x2602	Command Error: Incorrect password.
0x2604	Command Error: Protected.
0x2605	Command Error: Service already executing.
0x2606	Command Error: Service stopped.
0x2607	Command Error: No execution right.
0x2608	Command Error: Settings not complete.
0x2609	Command Error: Necessary items not set.
0x260A	Command Error: Number already defined.
0x260B	Command Error: Error will not clear.
0x3001	Access Right Error: No access right.
0x4001	Abort: Service aborted.

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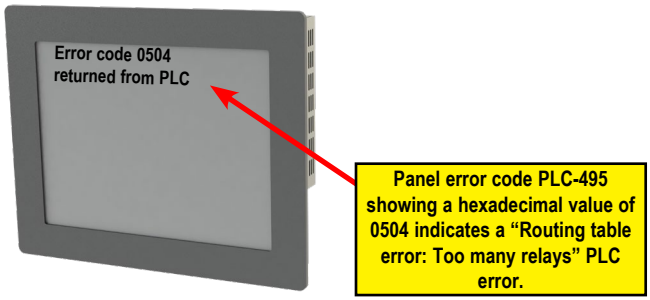
Omron – Panel Error Code P495 Explanation

The PLC-495 error code is used to show any errors that are generated by the connected PLC. The PLC-495 error message includes a four digit hexadecimal value embedded in the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the Omron CS/CJ FINS Ethernet communication protocol are represented by a hexadecimal value as shown in the following message example.

Omron Error Code PLC-495 Message Example:



Omron CS/CJ FINS Ethernet Protocol – PLC Error Code Table

The following table lists the errors that can be generated by the Omron PLC when using the CS/CJ FINS Ethernet protocol.

NOTE: *The following errors can be generated from the designated PLC, are monitored by the* ***C-more*** *HMI, and are displayed on the attached screen as a hexadecimal value in panel error code PLC-499 message, if active. Please refer to the PLC manufacturer's documentation for additional information.*

PLC Error Codes for Omron CS/CJ FINS Ethernet	
Panel Error Code PLC-495 Hex Value	**Description**
0103	Local Error: Send Error from lack of buffer space. Try reducing Ethernet load to the module.
0201	Destination Node Error: IP address of remote node not set correctly.
0202	Destination Node Error: No node with the specified unit address found.
0205	Destination Node Error: Packet corrupted or Response timeout. Try increasing timeout.
0301	Controller Error: Communications controller error.
0302	Controller Error: CPU Unit error. Check error LEDs on PLC. Refer to documentation for that CPU.
0304	Controller Error: Unit number error. Make sure Unit number is not used twice.
0401	Service unsupported: Undefined command.
0501	Routing table error: Destination address setting error. Routing table incorrect.
0502	Routing table error: No routing tables.
0503	Routing table error: Routing table error.
0504	Routing table error: Too many relays.
1001	Command format error: Command too long. Bad packet: check for electrical noise and grounding.
1002	Command format error: Command too short. Bad packet: check for electrical noise and grounding.
1003	Command format error: Elements/data don't match. Bad packet: check for electrical noise and grounding.
1005	Command format error: Header error. This is the error received when station # set in the command does not match the station # of the Ethernet module.
1100	Parameter error: UDP socket number bad.
1101	Parameter error: Address requested does not exist in PLC.
1103	Parameter error: Address area requested in not accessible.
220F	Status error: Duplicate Socket error.
2210	Status error: Specified socket not open.
2305	Environment Error: IP address conversion failed. Only encountered when using routing tables.
2307	Environment Error: IP address conversion set for automatic.
2503	Unit error: I/O setting error.
2505	Unit error: CPU bus error.
250A	Unit error: CPU Bus Unit error.

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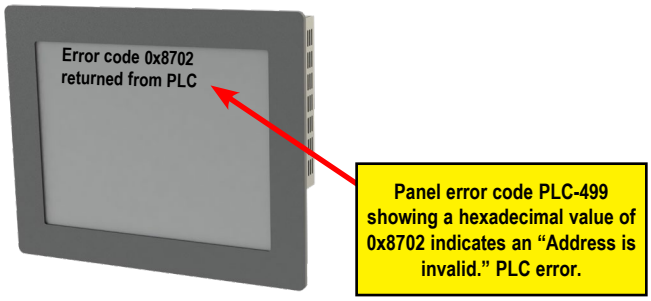
Siemens – Panel Error Code P499 Explanation

The PLC-499 error code is used to show any errors that are generated by the connected PLC. The PLC-499 error message includes a four digit hexadecimal value displayed at the end of the message. This value can be looked up in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the Siemens PPI communication protocols breakdown into a four digit hexadecimal value as shown in the following message example.

Siemens Error Code PLC-499 Message Example:



Siemens PPI Protocol – PLC Error Code Table

PLC PDU Header Errors for S7-200 PPI	
Panel Error Code PLC-499 Hex Value	**Description**
0x0001	Hardware Fault.
0x0003	Object access not allowed: Occurs when access to Timer and Counter data type is set to Signed Integer and not BCD.
0x0004	Context not supported.
0x0005	Address out of range: Occurs when requesting an address within a Data Block that does not exist or is out of range.
0x0006	Address out of range.
0x0007	Write Data size mismatch.
0x000A	Object does not exist: Occurs when trying to request a Data Block that does not exist.
0x8000	Function being used.
0x8001	Action is not allowed in current mode.
0x8101	Hardware fault.
0x8103	Access not allowed.
0x8104	Function not supported.
0x8105	Address invalid.
0x8106	Data Type not supported.
0x8107	Data Type is not consistent with size.
0x810A	Object does not exist.
0x8500	PDU Size is incorrect.
0x8702	Address is invalid.
0xD201	Block name syntax error.
0xD202	Error with function parameter.
0xD203	Error with block type.
0xD204	No linked block.
0xD205	Object already exists.
0xD206	Object already exists.
0xD207	Block already used in EPROM.
0xD209	Block does not exist.
0xD20E	No Block does not exist.
0xD210	Block number incorrect.

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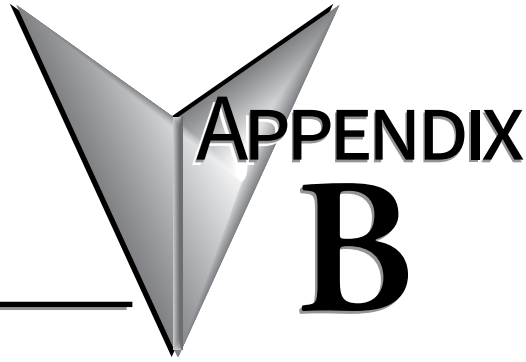
Siemens ISO over TCP Protocol – PLC Error Code Table

PLC PDU Header Errors for S7-300 CPU, S7-200 Ethernet	
Panel Error Code PLC-499 Hex Value	**Description**
0x0001	Hardware Fault.
0x0003	Object access not allowed: Occurs when access to Timer and Counter data type is set to Signed Integer and not BCD.
0x0004	Context not supported.
0x0005	Address out of range: Occurs when requesting an address within a Data Block that does not exist or is out of range.
0x0006	Address out of range.
0x0007	Write Data size mismatch.
0x000A	Object does not exist: Occurs when trying to request a Data Block that does not exist.
0x8000	Function being used.
0x8001	Action is not allowed in current mode.
0x8101	Hardware fault.
0x8103	Access not allowed.
0x8104	Function not supported.
0x8105	Address invalid.
0x8106	Data Type not supported.
0x8107	Data Type is not consistent with size.
0x810A	Object does not exist.
0x8500	PDU Size is incorrect.
0x8702	Address is invalid.
0xD201	Block name syntax error.
0xD202	Error with function parameter.
0xD203	Error with block type.
0xD204	No linked block.
0xD205	Object already exists.
0xD206	Object already exists.
0xD207	Block already used in EPROM.
0xD209	Block does not exist.
0xD20E	No Block does not exist.
0xD210	Block number incorrect.

HMI Runtime Errors



In This Appendix...

Introduction **B-2**

Runtime Errors **B-3**

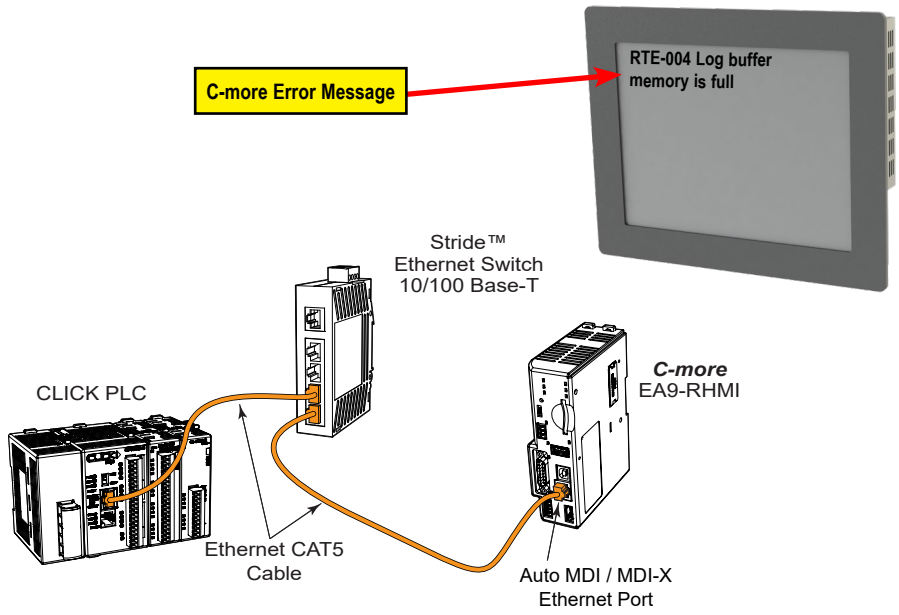
Log File Naming B-4

Introduction

The ***C-more*** family of HMIs have diagnostics built-in to the operating system that monitor various runtime functions that will display an error message on the panel's display indicating that a particular error has occurred and what the error represents. The Error Message(s) is displayed in the upper left area of the display screen. The Runtime Errors are also logged into the panel's Error log under the Information tab in the panel's System Setup Screens. The Error Log Code, for example RTE-004, identifies the error on the System Screen - Error tab and in the error log. See **Chapter 5: System Setup Screens** for additional details. The tables that follow show the possible Runtime Errors.

Users can include this diagnostic information in their HMI projects by using the system tag name SYS ERR ERRORCODE to control displayed screens, operator messages, etc., and also communicate error information to the PLC or controlling device. If a runtime error occurs, the SYS ERR ERRORCODE system tag will contain the numeric value shown under the Tag Code Error Value. For example, if the panel project is configured to log to USB and no USB flash drive is installed in the panel, the panel will display "RTE-004 Log buffer memory is full" and the SYS ERR ERRORCODE system tag will contain the value 2004. The value of the last runtime error detected will remain in the SYS ERR ERRORCODE.

If you have difficulty determining the cause of the error, refer to **Chapter 8: Troubleshooting** for additional help or contact our technical support group at 770-844-4200



Runtime Errors

If there is more than one Runtime Error, then the Error Message displayed at the top of the panel's screen will display for 3 seconds, then be off for 2 seconds. The next Error Message will display for the same time increment. This will continue through any other active runtime error messages and then start over. When only one Runtime Error is active, then that message will continuously be displayed until it is no longer active.

No.	Error Log Code	Error Message Located at upper left of screen	Error Message Tag	Tag Error Code Value	System Screen Info > Error	Cause
Log Error						
1	RTE-001	Log Failed. Not enough Memory Space in %Device%	SYS ERR ERRORCODE	2001	MM/DD/YY HH/MM/SS Error Code RTE-001	The size of the destination memory is not large enough to store the data. See Log File Naming below.
2	RTE-002	Log Failed. %Device% cannot be found	SYS ERR ERRORCODE	2002	MM/DD/YY HH/MM/SS Error Code RTE-002	No device available or the device is defective. See Log File Naming below.
3	RTE-003	Log Failed. Cannot write file - %file%	SYS ERR ERRORCODE	2003	MM/DD/YY HH/MM/SS Error Code RTE-003	Logging the data has failed due to a problem such as the memory write protect is enabled. See Log File Naming below.
4	RTE-004	Log cache memory is full	SYS ERR ERRORCODE	2004	MM/DD/YY HH/MM/SS Error Code RTE-004	The data log buffer in the SRAM memory is full. See Log File Naming below.
Screen Capture						
1	RTE-011	Capture Failed. Not enough Memory Space in %Device%	SYS ERR ERRORCODE	2011	MM/DD/YY HH/MM/SS Error Code RTE-011	The size of the destination memory is not large enough to store the data.
2	RTE-012	Capture Failed. %Device% cannot be found	SYS ERR ERRORCODE	2012	MM/DD/YY HH/MM/SS Error Code RTE-012	No device available or the device is defective.
3	RTE-013	Capture Failed. Cannot write file - %file%	SYS ERR ERRORCODE	2013	MM/DD/YY HH/MM/SS Error Code RTE-013	Logging the data has failed due to a problem such as the memory write protect is enabled.

Table continued on page B-5

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Log File Naming

When using the Line Trend Graph to Log, the log file name is formed automatically in the panel. The visible file name has the following format:

Screen Name + "_" + Object name + "_" + Date Stamp YYMMDD + ".txt"

Internal to the panel, the file references are stored as the first four characters of the file name + "~" + a serial number between 000 and 999 + ".txt" So, any "group" of filenames is limited to 999 members.

For example: The following filenames form the same group. All filenames start with "**SCRE**":

Screen1_Trend1_yymmdd.txt
Screen2_Trend2_yymmdd.txt
Screen3_Trend3_yymmdd.txt

When the 999 filename limit is reached, the oldest files will automatically be deleted and logging will continue.

Visible File Name	Internal File Name
Screen1_Trend1_120101.txt	**SCRE**~001.TXT
Screen2_Trend2_120101.txt	**SCRE**~002.TXT
Screen3_Trend3_120101.txt	**SCRE**~003.TXT
Screen1_Trend1_120102.txt	**SCRE**~004.TXT
Screen2_Trend2_120102.txt	**SCRE**~005.TXT
Screen3_Trend3_120102.txt	**SCRE**~006.TXT
...	
Screen1_Trend1_121129.txt	**SCRE**~997.TXT
Screen2_Trend2_121129.txt	**SCRE**~998.TXT
Screen3_Trend3_121129.txt	**SCRE**~999.TXT
Screen1_Trend3_121130.txt	Runtime Error RTE-001

Workaround: To minimize membership in any one group, change the Screen name and the Object name so the first four characters of the visible file name are unique

For example,

Screen Names: S1, S2

Object Names: AAA, BAA

Visible File Name	Internal File Name
S1_AAA_150101.txt	**S1_A**~001.TXT
S1_BAA_150101.txt	**S1_B**~001.TXT
S2_AAA_150101.txt	**S2_A**~001.TXT
S2_BAA_150101.txt	**S2_B**~001.TXT
S1_AAA_150102.txt	**S1_A**~002.TXT
S1_BAA_150102.txt	**S1_B**~002.TXT
S2_AAA_150102.txt	**S2_A**~002.TXT
S2_BAA_150102.txt	**S2_B**~002.TXT
…	
S1_AAA_151231.txt	**S1_A**~365.TXT
S1_BAA_151231.txt	**S1_B**~365.TXT
S2_AAA_151231.txt	**S2_A**~365.TXT
S2_BAA_151231.txt	**S2_B**~365.TXT

Note that there is no conflict between file names and since no log group will exceed 365 (days) the 999 member limit is never exceeded.

Runtime Errors (cont'd)

No.	Error Log Code	Error Message Located at upper left of screen	Error Message Tag	Tag Error Code Value	System Screen Info > Error	Cause
Handshake						
1	RTE-021	Handshake Timeout Error	SYS ERR ERRORCODE	2021	MM/DD/YY HH/MM/SS Error Code RTE-021	A communications timeout occurred when either a Recipe or Numeric Entry Object, in which Notification and Handshake signals are used, failed to complete the responses.
e-mail						
1	RTE-041	E-mail Connection Error %Address%	SYS ERR ERRORCODE	2041	MM/DD/YY HH/MM/SS Error Code RTE-041	An incorrect SMTP address has been entered into the HMI Network dialog screen.
2	RTE-042	Send E-mail Error %Address%	SYS ERR ERRORCODE	2042	MM/DD/YY HH/MM/SS Error Code RTE-042	An incorrect email address has been entered into the Address Book.
3	RTE-043	Email Failed: The file cannot be attached	SYS ERR ERRORCODE	2043	MM/DD/YY HH/MM/SS Error Code RTE-043	
Send FTP						
1	RTE-051	FTP Connection Error %Address%&%ID%	SYS ERR ERRORCODE	2051	MM/DD/YY HH/MM/SS Error Code RTE-051	An incorrect FTP Service has been assigned into the HMI Network dialog screen.
2	RTE-052	Send FTP Error %Address%&%ID%	SYS ERR ERRORCODE	2052	MM/DD/YY HH/MM/SS Error Code RTE-052	Permission to write to the FTP folder has not been authorized. The FTP site may require a user ID and password.
3	RTE-053	FTP Failed: The file cannot be copied	SYS ERR ERRORCODE	2053	MM/DD/YY HH/MM/SS Error Code RTE-053	
Recieve FTP						
1	RTE-061	Receive FTP Error	SYS ERR ERRORCODE	2061	MM/DD/YY HH/MM/SS Error Code RTE-061	
Receive HTTP						
1	RTE-071	Receive HTTP Error	SYS ERR ERRORCODE	2071	MM/DD/YY HH/MM/SS Error Code RTE-071	

Runtime Errors (cont'd)

No.	Error Log Code	Error Message Located at upper left of screen	Error Message Tag	Tag Error Code Value	System Screen Info > Error	Cause
Sound						
1	RTE-081	Sound Failed. Not enough Memory	SYS ERR ERRORCODE	2081	MM/DD/YY HH/MM/SS Error Code RTE-081	The sound file failed to play due to insufficient memory.
Confiict						
1	RTE-091	IP Address Conflict - Correct IP Address and Power Cycle	SYS ERR ERRORCODE	2091	MM/DD/YY HH/MM/SS Error Code RTE-091	Conflict of IP Address
Multiple Recipe						
1	RTE-101	Record doesn't exist	SYS ERR ERRORCODE	2101	MM/DD/YY HH/MM/SS Error Code RTE-101	The recipe file or data doesn't exist.
2	RTE-102	File cannot open	SYS ERR ERRORCODE	2102	MM/DD/YY HH/MM/SS Error Code RTE-102	The recipe file cannot be opened.
3	RTE-103	E-mail Connection Error %Address%	SYS ERR ERRORCODE	2103	MM/DD/YY HH/MM/SS Error Code RTE-103	Abnormality is found in the numeric character data of the recipe file.
4	RTE-104	Send E-mail Error %Address%	SYS ERR ERRORCODE	2104	MM/DD/YY HH/MM/SS Error Code RTE-104	Abnormality is found in the Tag data of the recipe file.
5	RTE-105	Recipe - Index (%Row%) error	SYS ERR ERRORCODE	2105	MM/DD/YY HH/MM/SS Error Code RTE-105	Recipe was operated by the record number outside the range.
6	RTE-106	Not enough buffer memory	SYS ERR ERRORCODE	2106	MM/DD/YY HH/MM/SS Error Code RTE-106	Memory allocation error
7	RTE-107	File cannot write	SYS ERR ERRORCODE	2107	MM/DD/YY HH/MM/SS Error Code RTE-107	There was an error trying to write the recipe file.
8	RTE-108	Wrong file format	SYS ERR ERRORCODE	2108	MM/DD/YY HH/MM/SS Error Code RTE-108	The recipe file format is incorrect.
9	RTE-109	Not enough Memory Space in %Device%	SYS ERR ERRORCODE	2109	MM/DD/YY HH/MM/SS Error Code RTE-109	Insufficient storage space on media.

Runtime Errors (cont'd)

No.	Error Log Code	Error Message Located at upper left of screen	Error Message Tag	Tag Error Code Value	System Screen Info > Error	Cause
Action						
1	RTE-121	Action Overflows	SYS ERR ERRORCODE	2121	MM/DD/YY HH/MM/SS Error Code RTE-121	The number of actions executed in the event exceeded the maximum number.
SRAM Error						
1	RTE-500	SRAM Check Sum Error	SYS ERR ERRORCODE	2500	MM/DD/YY HH/MM/SS Error Code RTE-500	Memory in panel has been corrupted by power loss, etc. Try cycling power to the panel and re-transfer the project to the panel in sequential steps to attempt to resolve the error.
SD Ejection						
1	RTE-130	SD1 has been removed from the HMI and the HMI has stopped. To restart the HMI, insert the SD1 card and press Reboot.	SYS ERR ERRORCODE	2121		
2	RTE-131	The panel has detected a project file in SD1 and in the HMI built-in Flash. Only one location can contain a project. See Help File topic Project Storage / Boot Location.	SYS ERR ERRORCODE	2131		

SECURITY CONSIDERATIONS FOR CONTROL SYSTEMS NETWORKS

In This Appendix...

Security Considerations for Control Systems Networks..... C-2

Security Considerations for Control Systems Networks

Manufacturers are realizing that to stay competitive, their Automation and Control Systems need to be more integrated within their plant. The systems often need to be integrated with upstream Enterprise Data Systems, and even further integrated to allow information to be accessible across multiple plants, or even through the Internet. This convergence of the IT world with the Automation World creates challenges in maintaining secure systems and protecting your investments in processes, personnel, data and intellectual property.

While Automation Networks and Systems have built-in password protection schemes, this is only one very small step in securing your systems. Automation Control System Networks need to incorporate data protection and security measures that are at least as robust as a typical business computer system. We recommend that users of PLCs, HMI products and SCADA systems perform your own network security analysis to determine the proper level of security required for you application. However, the Department of Homeland Security's National Cybersecurity and Communications Integration Center (NCCIC) and Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) has provided direction related to network security and safety under an approach described as "Defense in Depth", which is published at https://ics-cert.us-cert.gov/sites/default/files/recommended_practices/NCCIC_ICS-CERT_Defense_in_Depth_2016_S508C.pdf.

This comprehensive security strategy involves physical protection methods, as well as process and policy methods. This approach creates multiple layers and levels of security for industrial automation systems. Such safeguards include the location of control system networks behind firewalls, their isolation from business networks, the use of intrusion detection systems, and the use of secure methods for remote access such as Virtual Private Networks (VPNs). Further, users should minimize network exposure for all control system devices and such control systems and these systems should not directly face the internet. Following these procedures should significantly reduce your risks both from external sources as well as internal sources, and provide a more secure system.

It is the user's responsibility to protect such systems, just as you would protect your computer and business systems. AutomationDirect recommends using one or more of these resources in putting together a secure system:

- ICS-CERT's Control Systems recommended practices at the following web address: https://ics-cert.us-cert.gov/Recommended-Practices
- Special Publication 800-82 of the National Institute of Standards and Technology – Guide to Industrial Control Systems (ICS) Security: https://csrc.nist.gov/publications/detail/sp/800-82/rev-2/final
- ISA99, Industrial Automation and Control Systems Security https://www.isa.org/MSTemplate.cfm?MicrositeID=988&CommitteeID=6821 (please note this is a summary and these standards have to be purchased from ISA)

The above set of resources provides a comprehensive approach to securing a control system network and reducing risk and exposure from security breaches. Given the nature of any system that accesses the internet, it is incumbent upon each user to assess the needs and requirements of their application and take steps to mitigate the particular security risks inherent in their control system

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