



## 6-inch Micro-Graphic Panel 3-inch Micro-Graphic Panel

### Hardware User Manuals

*EA1-MG6-USER-M*

*EA1-MG-USER-M*





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## 6-inch Micro-Graphic Panel

### Hardware User Manual

EA1-MG6-USER-M

**C-more 6" Micro-Graphic Panel  
EA1-S6ML - shown in Portrait Mode**



**C-more 6" Micro-Graphic Panel  
EA1-S6MLW - shown in Landscape Mode**



**C-more 6" Micro-Graphic Panel Installed in a  
21-button Portrait Keypad Bezel EA-MG6-BZ2P**



**C-more 6" Micro-Graphic Panel Installed in a  
20-button Landscape Keypad Bezel EA-MG6-BZ2**







# Graphic Panel - 6 Inch

## 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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# GETTING STARTED

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# CHAPTER 1

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## Introduction

### The Purpose of this Manual

Thank you for purchasing from our *C-more*<sup>®</sup> Micro-Graphic family of products. This manual describes *AutomationDirect.com's C-more 6"* Micro-Graphic panels, their 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 products. It also helps you understand how to interface the panels to other devices in a control system.

This user manual contains important information for personnel who will install the panels and accessories, and for the personnel who will be programming the panel. If you understand control systems making use of operating interfaces such as the *C-more* Micro-Graphic panels, 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 panel. You may also refer to the online help that is available in the *C-more* Micro-Graphic programming software.

### Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. If you cannot find the solution to your particular application, or, if for any reason you need technical assistance, please call us at:

**770-844-4200**

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company.

**<http://www.automationdirect.com>**

If you have a comment, question or suggestion about any of our products, services, or manuals, please fill out and return the 'Suggestions' card that was included with this manual.

# 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.



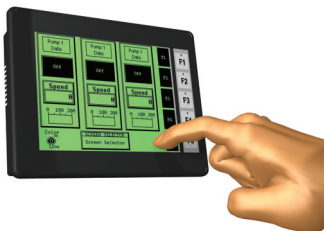
When you see the “exclamation mark” icon in the left-hand margin, the paragraph to its immediate right will be a warning. This information could prevent injury, loss of property, or even death (in extreme cases). The word **WARNING:** in boldface will mark the beginning of the text.

## Key Topics for Each Chapter

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

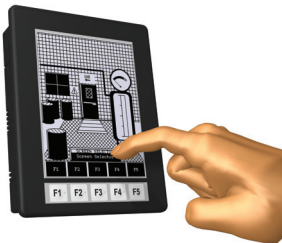
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# Product Overview



**EA1-S6ML**

*shown in Landscape (Horizontal) mode*



**EA1-S6MLW**

*shown in Portrait (Vertical) mode*

The *C-more* 6" Micro-Graphic panel has a 5.7-inch STN LCD monochrome 320 x 240 dot display. Model EA1-S6ML has five selectable LED-driven backlight colors including Green, Red, Amber, Yellow and Lime. Model EA1-S6MLW has five selectable LED-driven backlight colors including White, Pink1, Pink2, Pink3 and Red. Both models feature five user-defined function keys, each key with a user-defined red LED indicator. The panels can display up to 40 lines by 78 characters of static text and up to 40 lines by 40 characters of dynamic text with embedded variables and phrases mixed with graphics at landscape orientation. Portrait orientation can display 59 characters and 40 lines of static text and 40 lines by 40 characters of dynamic text. Each model is rated NEMA 4/4X, IP-65 (when mounted correctly, for **indoor** use only). The *C-more* 6" Micro-Graphic panels are powered from a 12-24 VDC power supply or can operate in low-power mode when powered from the serial communications port of select AutomationDirect PLCs.

Other features include:

- 1792 KB memory
- Built in RJ12 serial communications port (RS-232)
- Built in 15-pin serial communications port (RS-232/422/485)
- Adjustable contrast
- 2 optional keypad bezels, 20-button landscape and 21-button portrait mount
- Optional replaceable clear screen overlay
- Built in Alarm Control setup that activates beep, backlight flash, customized alarm banner, and red LED blinking
- Up to 999 screens, limited only by memory usage
- 0 to 50 °C (32 to 122 °F) operating temperature range
- UL, cUL & CE agency approvals (see below for details)
- 2-year warranty from date of purchase

## Agency Approvals

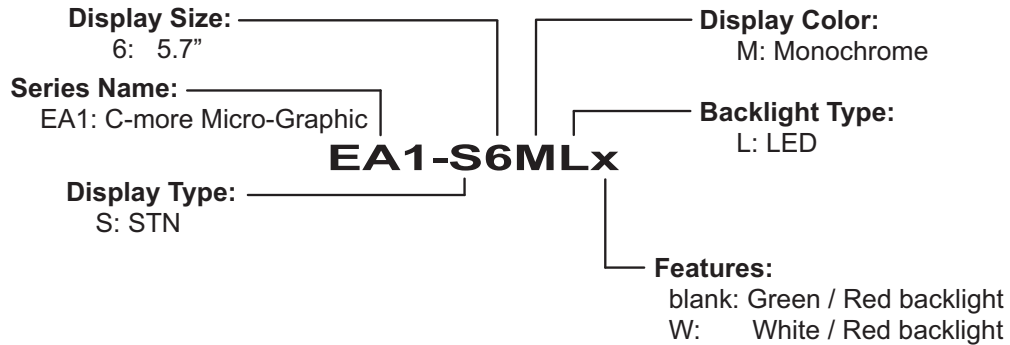
UL/CUL/CE Certification Numbers				
Name	UL/CUL	UL508	CE	ISO-9000
C-more Micro-Graphic Panels & Accessories	E157382	E157382	EN61131-2	Yes



## Part Number Key

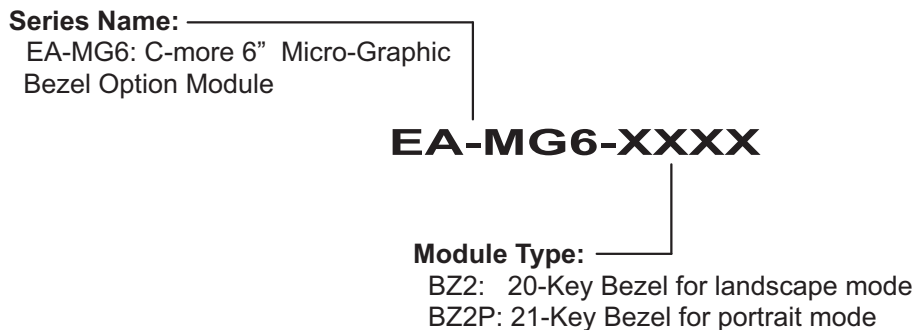
### Panel Part Number Key

The *C-more* 6" Micro-Graphic panel part numbers consist of the following:



### Bezel Part Number Key

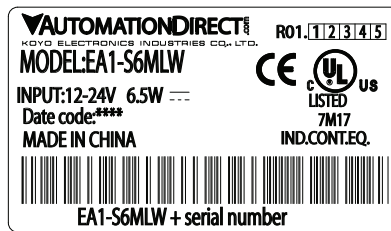
The optional *C-more* 6" Micro-Graphic keypad bezel part numbers consist of the following:



## Product Label Example:

EA1-S6ML

EA1-S6MLW



## Serial Number and Date Code format:

Serial Number = [Part Number]+[YYMDDFNNN]

Date Code = YYMF

**YY:** Year (07–99 --- e.g. 07 = 2007)  
**M:** Month (1–9, X, Y, Z --- e.g. X = Oct.)  
**DD:** Day (1–31)  
**F:** Manufacturing Site (0–9, A–Z)  
**NNN:** Sequence number for the date listed (000–999)

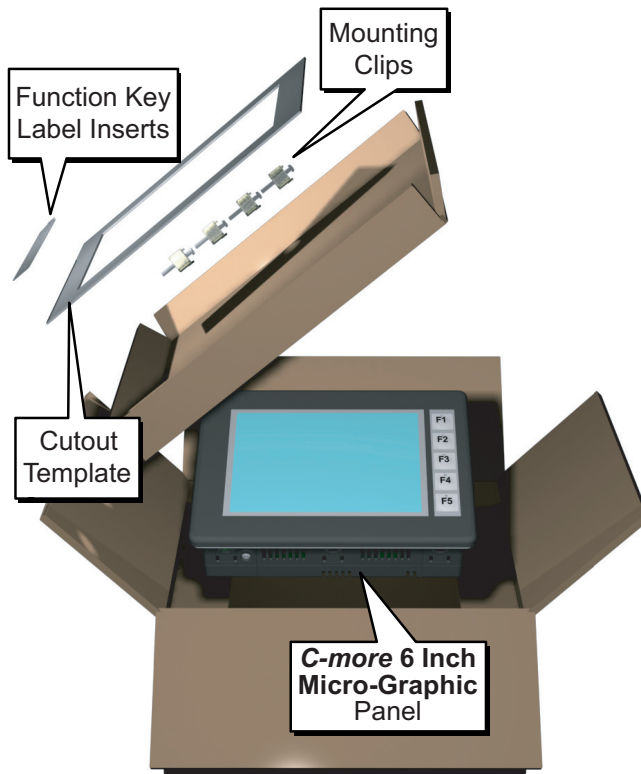
## Quick Start Steps

1

### Step 1 – Unpack and Inspect

a.) Unpack the *C-more* 6" Micro-Graphic panel from its shipping carton. Included in the carton are the following:

- *C-more* 6" Micro-Graphic panel (EA1-S6ML or EA1-S6MLW)
- cutout template
- mounting clips
- gasket
- blank function key label inserts
- Quick Start Guide



**Shipping Carton Contents**

b.) Unpack any accessories that have been ordered, such as: Keypad Bezel, programming cable, PLC 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**

**20-Button Horizontal Keypad Bezel  
EA-MG6-BZ2**

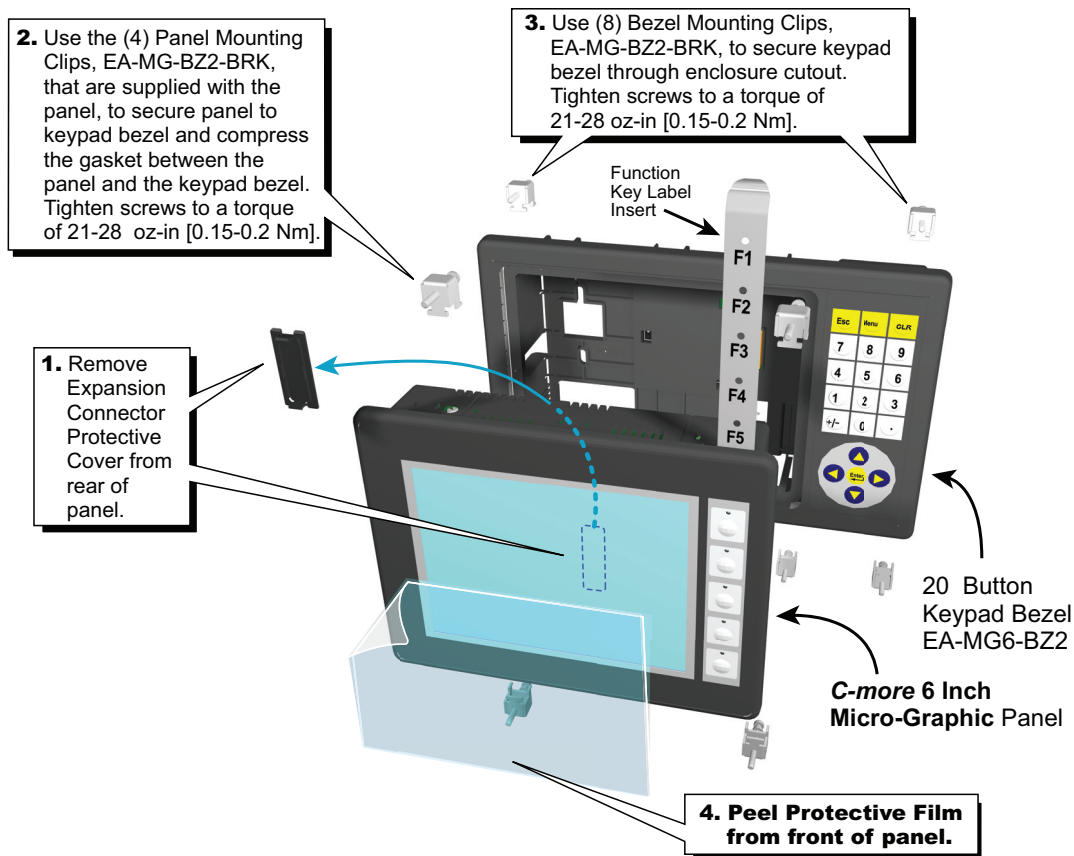


**21-Button Vertical Keypad Bezel  
EA-MG6-BZ2P**



## Step 2 – Install Optional Hardware Accessories

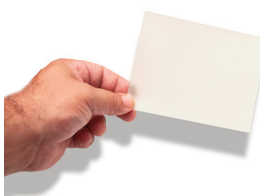
Below is an example of a *C-more* 6" Micro-Graphic panel being assembled with an optional EA-MG6-BZ2 20-button Keypad Bezel.



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

## Optional Accessory

Clear Screen Overlay  
EA-6-COV2



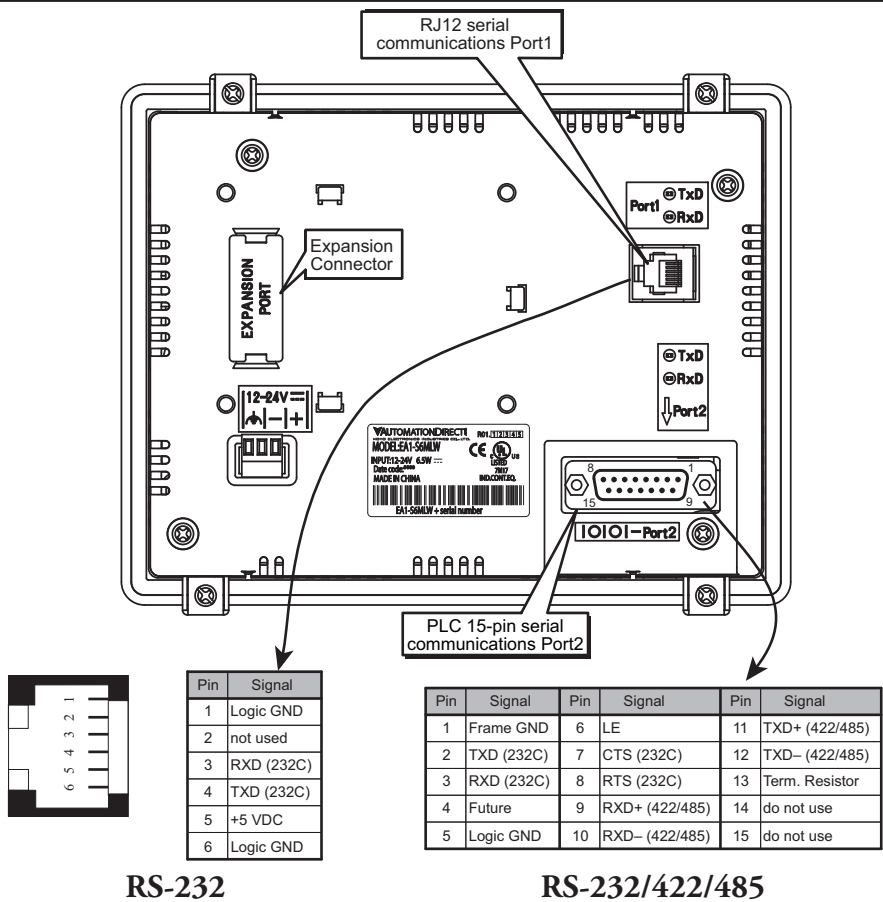


Step 3 – Become Familiar with Available Communication Ports

The *C-more* 6" Micro-Graphic panel includes a built-in RS-232 serial communications port designated as Port1. This port uses an RJ12 type telephone jack to make connections to either the EA-MG-PGM-CBL programming cable assembly or a communications cable, such as an EA-2CBL, to interface with a PLC or controller. The panel can receive power through this port from the serial communications port on select *Direct*LOGIC PLCs. The other serial communications port designated as Port2 is a 15-pin D-sub connector that supports RS-232, RS-485 and RS-422.



**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.



**NOTE:** See Chapter 2: Specifications and Chapter 6: PLC Communications for additional details on the available communication ports, protocols and cables.



**NOTE:** The panel has a built-in RJ12 serial communications port (Port1 - RS-232) and a built in 15-pin serial communications port (Port2 - RS-232/422/485). **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Port1 or Port2 under the Panel Manager dialog box. When using Port2 to communicate with the connected PLC, Port1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## Step 4 – Install *C-more* 6" Micro-Graphic Panel

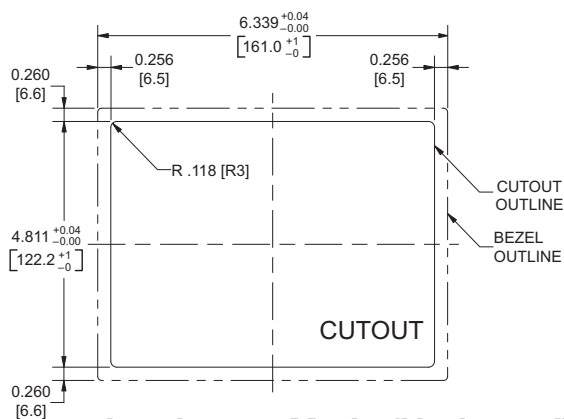
The *C-more* 6" Micro-Graphic panel can be mounted through a cutout in an enclosure by using the template that is provided with the panel, or using the dimensions shown below. Cutout dimensions for the 20-button landscape and 21-button portrait keypad bezel options are also shown below. The keypad bezels also include a template that can be used. The enclosure mounting thickness range for the panels and the keypad bezels is 0.04"–0.2" [1–5 mm].

The screw torque range for the screws used on the panel mounting clips and the keypad bezel mounting clips is 21–28 oz-in [0.15–0.2 Nm].

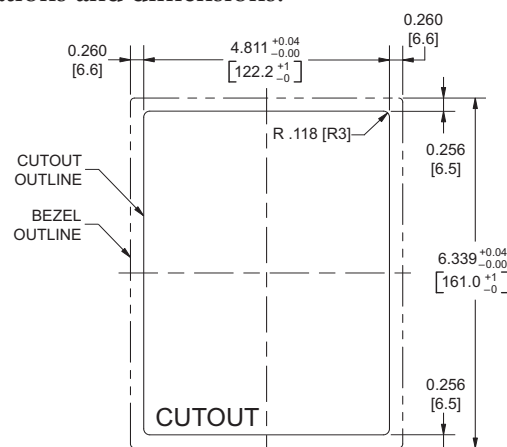
See **Chapter 2: Specifications** for additional product dimensions.

**Chapter 3: Accessories** for accessory specifications and dimensions.

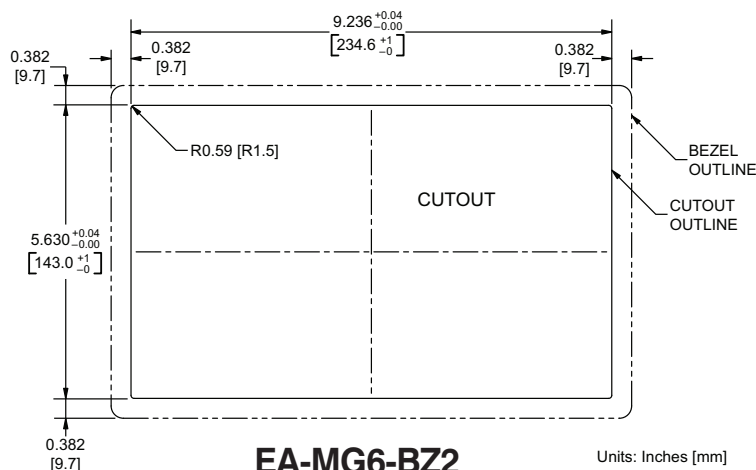
### **EA1-S6ML & EA1-S6MLW** **Panel Cutout**



**Landscape Mode (Horizontal)**

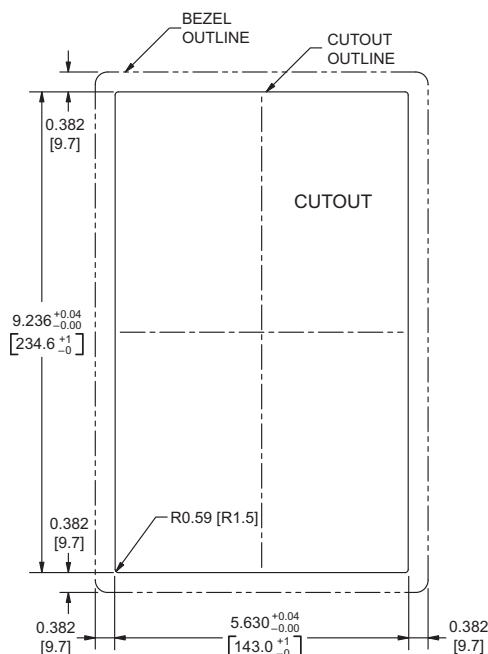


**Portrait Mode (Vertical)**



**EA-MG6-BZ2**  
**Landscape (Horizontal)**  
**Keypad Bezel Cutout**

Units: Inches [mm]

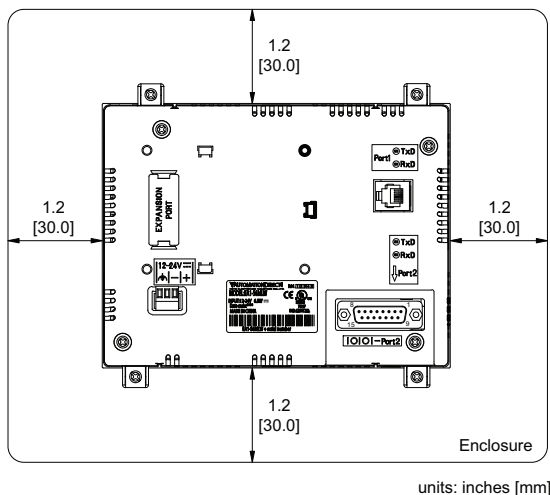


**EA-MG6-BZ2P**  
**Portrait (Vertical)**  
**Keypad Bezel Cutout**

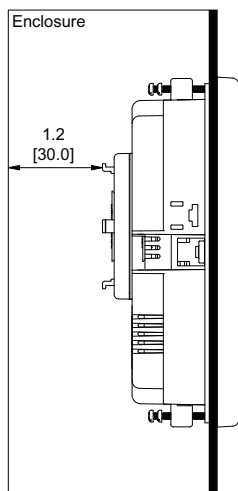
## Enclosure Clearances

A 1.2" [30mm] minimum clearance is required inside an enclosure for proper ventilation of the *C-more* Micro-Graphic panel.

**EA1-S6ML(W)  
Rear View**

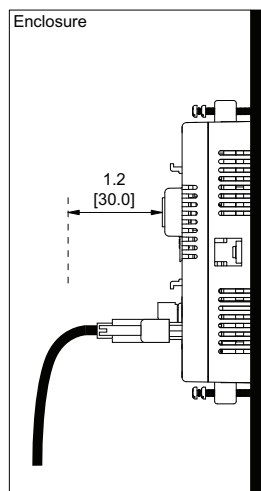


**Panel with Keypad  
Bezel**



**EA1-S6ML(W) with  
EA-MG6-BZ2(P)**

**Panel only**



**EA1-S6ML(W)**



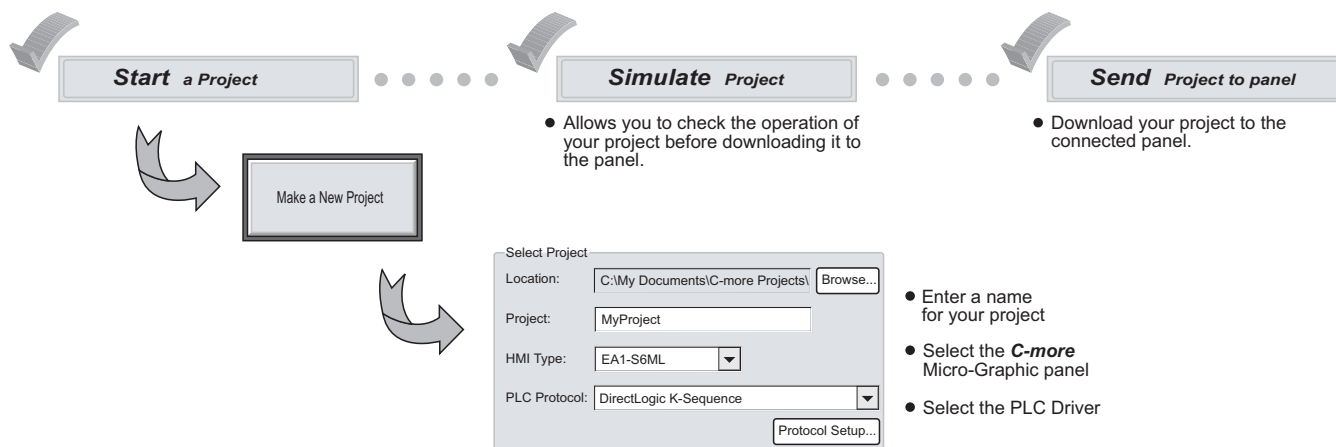
**NOTE:** Additional clearance inside the enclosure is required when connecting to the 15-pin serial communications port (Port2).

## Step 5 – Install the Programming Software and Develop a Project

Following are the minimum system requirements for running *C-more* Micro-Graphic Programming Software, EA-MG-PGMSW, on a PC:

- Personal Computer with a 333 MHz or higher processor (CPU) clock speed recommended; (Windows® 2000 with Service Pack 4 or Windows® XP, 800 MHz or higher processor (CPU) clock speed recommended (Windows® Vista (32 bit)); Intel® Pentium/Celeron family, or AMD® K6/Athlon/Duron family, or compatible processor recommended
- Keyboard and Mouse or compatible pointing device
- Super VGA color video adapter and monitor with at least 800 x 600 pixels resolution (1024 x 768 pixels recommended) 64K color minimum
- 150 MB free hard-disk space
- 128 MB free RAM (512 MB recommended)
- CD-ROM or DVD drive for installing software from the CD, or internet access to download free programming software
- USB port to use with an EA-MG-PGM-CBL, USB to RS232 Programming Cable Assembly for project transfer from the programming software to the panel
- Operating System - Windows® XP Home / Professional Edition Service Pack 2, Windows® 2000 with Service Pack 4, or Windows® Vista (32 bit)

Insert the supplied CD-ROM into the PC's CD-ROM drive and follow the instructions. If you need assistance during the software installation, please refer to the supplied Software Installation Guide or call the *AutomationDirect* Technical Support team at 770-844-4200.



### Step 6 – Connect **C-more** 6” Micro-Graphic Panel to Computer

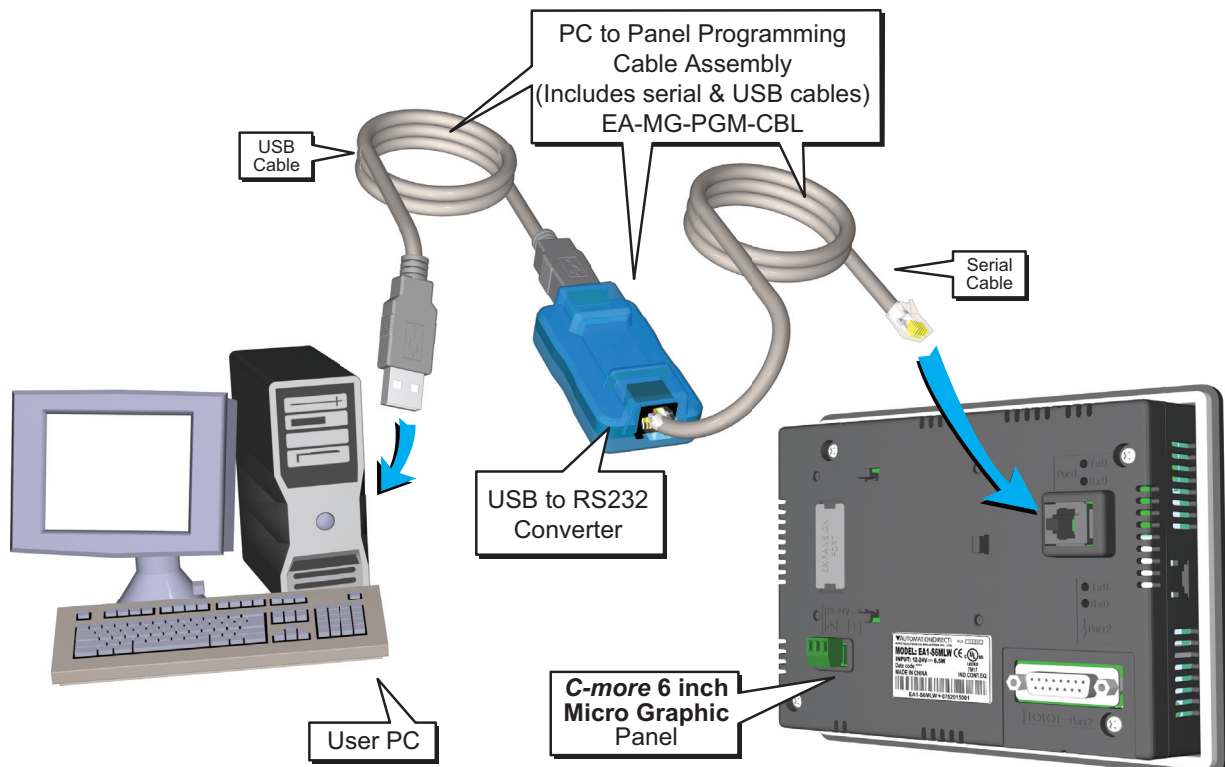
1



**NOTE:** Install *C-more Micro-Graphic Programming* software before connecting the panel to the PC to ensure the panel drivers install correctly.

Use an EA-MG-PGM-CBL, USB to RS-232 Programming Cable Assembly, from an USB port type A on the project development PC, through the supplied converter, to the RJ12 RS-232 programming/PLC serial communications port on the *C-more* Micro-Graphic panel as shown below.

#### USB to RS-232 Programming Cable Assembly



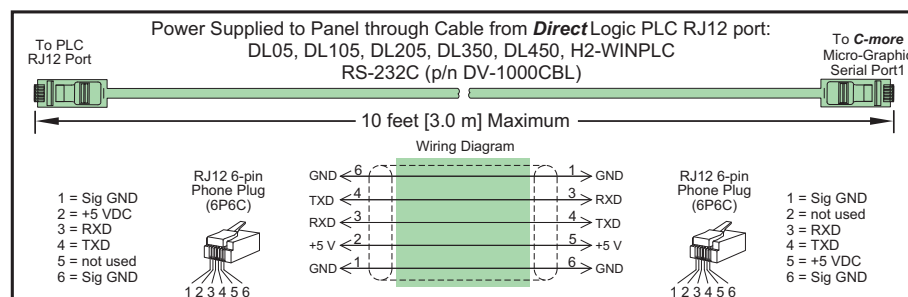
**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

## Step 7 – Providing Power to the *C-more* Micro-Graphic Panel

Power can be supplied to the *C-more* Micro-Graphic panel in one of three different ways.

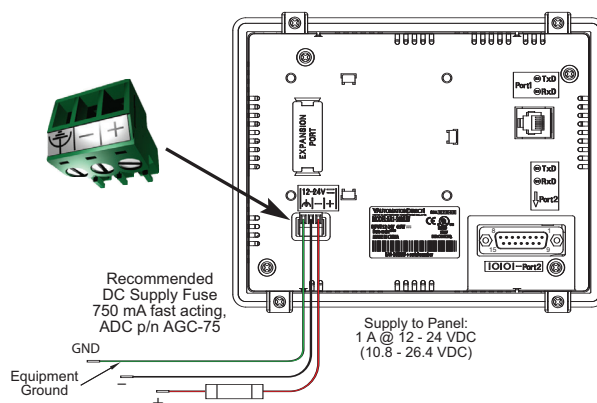
- 1.) During operation, the panel functions in High-Power Mode when powered by a minimum 1 Amp 12 - 24 VDC power source. Recommended power supplies are AutomationDirect part number PSP24-024S or PSP24-024C.
- 2.) The *C-more* Micro-Graphic panel is powered during programming from the PC through the USB to RS-232 Programming Cable Assembly, EA-MG-PGM-CBL. The panel will operate in Low-power mode when powered by the PC and result in a dim screen.
- 3.) Optionally, the *C-more* Micro-Graphic panel can function in Low-Power Mode powered from most *AutomationDirect* PLC's RJ12 serial communications port. Use a DV-1000CBL communications cable, or a DV-1000CBL communications cable with a FA-15HD 15-pin HD DSub/RJ12 Adapter connected to most AutomationDirect PLC's 15-pin HD communications port (DL06, D2-250-1 & D2-260) PLCs for Low-Power operation. See **Chapter 6: PLC Communications** for additional details. The panel will operate in low-power mode when powered by the PC.

### \*Panel Powered from AutomationDirect PLC via Communications Cable



**\*NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

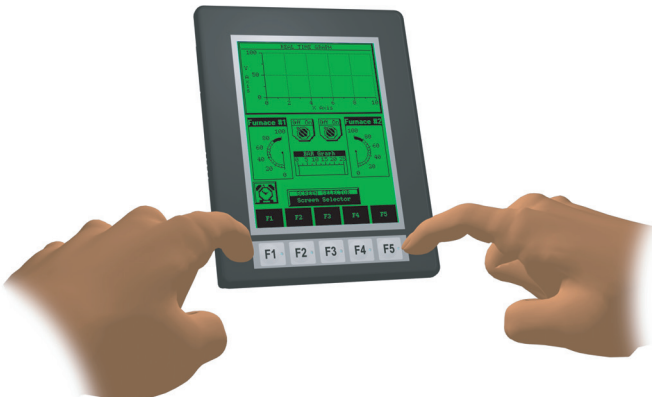
### Panel Powered from a DC Power Source - Wiring Diagram



**\*NOTE:** Recommended DC power supply to power the *C-more* Micro Graphic Panel, *AutomationDirect* Part No. PSP24-024S or PSP24-024C.

Step 8 – Accessing the *C-more 6”* Micro-Graphic Panel Setup Screens

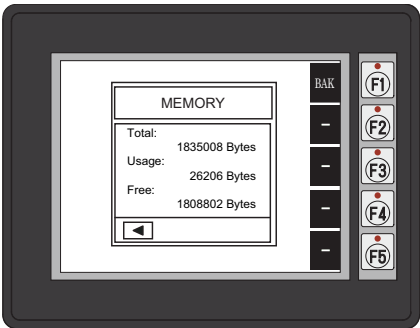
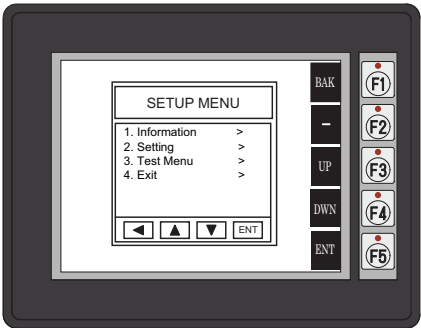
To access the **Setup Menu** of the panel’s setup screens, press the the BAK [F1] and ENT [F5] function keys simultaneously for three (3) seconds.



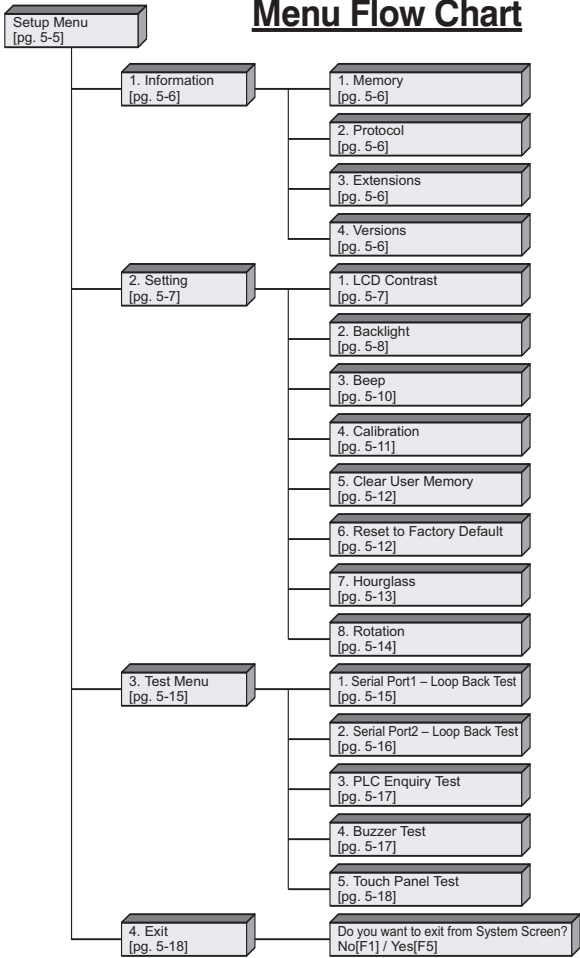
From the **Setup Menu**, information about the panel can be obtained, settings can be adjusted, and panel functions can be tested.



**NOTE:** See Chapter 5: System Setup Screens for details on using the setup screen settings and functions.



**Menu Flow Chart**





Step 9 – Choose *C-more* 6” Micro-Graphic Panel to PLC Protocol & Cables**Available PLC Protocols**

PLC Drivers	
<i>Serial - port1 or port2</i>	<i>Serial - port2 only</i>
DirectLOGIC K-sequence	Allen-Bradley DF1 Half Duplex
DirectNET	Allen-Bradley DF1 Full Duplex
Modbus (Koyo Addressing)	Allen-Bradley PLC5 DF1
Modbus RTU	Allen-Bradley DH485
Entivity Modbus RTU	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
	Mitsubishi FX
	Omron Host Link (C200 Adapter, C500)
	Omron FINS Serial (CJ1, CS1)
	Siemens PPI (S7-200 CPU)

**Available purchased cables**

Cable Description	Cable Part No.
<b><i>Cables used with serial Port1</i></b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	<b>DV-1000CBL</b>
<b>Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC source is required, however, screen brightness is diminished and the alarm beep will not function.</b>	
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	<b>D4-1000CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) <b>Use with DV-1000CBL cable.</b>	<b>FA-15HD</b>
<b>Direct</b> LOGIC PLC 15-pin D-sub port, DL405 (RS-232C).	<b>FA-CABKIT</b>
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>OP-3CBL-1</b>

Cable Description	Cable Part No.
<b><i>Cables used with serial Port2</i></b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	<b>EA-2CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).	<b>EA-2CBL-1</b>
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>EA-3CBL</b>
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).	<b>EA-4CBL-1</b>
<b>Direct</b> LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C).	<b>EA-4CBL-2</b>
Allen-Bradley MicroLogix 1000, 1100, 1200 & 1500 (RS-232C)	<b>EA-MLOGIX-CBL</b>
Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C)	<b>EA-SLC-232-CBL</b>
Allen-Bradley PLC-5 DF1 port (RS-232C)	<b>EA-PLC5-232-CBL</b>
Allen-Bradley MicroLogix, SLC 5-01/02/03, PLC5 DH485 port (RS-232C)	<b>EA-DH485-CBL</b>
GE 90/30, 90/70, Micro 90, Versamax Micro (Port2) 15-pin D-sub port (RS-422A)	<b>EA-90-30-CBL</b>
MITSUBISHI FX Series 25-pin port (RS-422A)	<b>EA-MITSU-CBL</b>
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	<b>EA-MITSU-CBL-1</b>
OMRON Host Link (C200 Adapter, C500) (RS-232C)	<b>EA-OMRON-CBL</b>

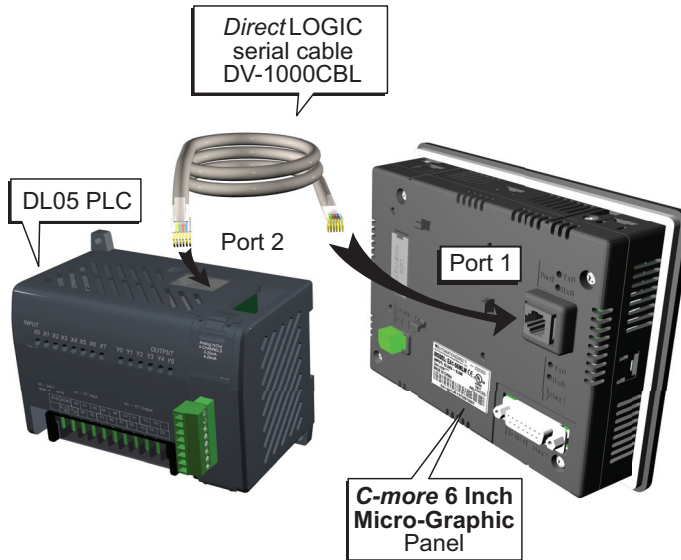


**NOTE:** See Chapter 6: PLC Communications for a detailed chart of PLC compatibility & cable connections. Chapter 6 includes wiring diagrams for end user construction of certain cables.

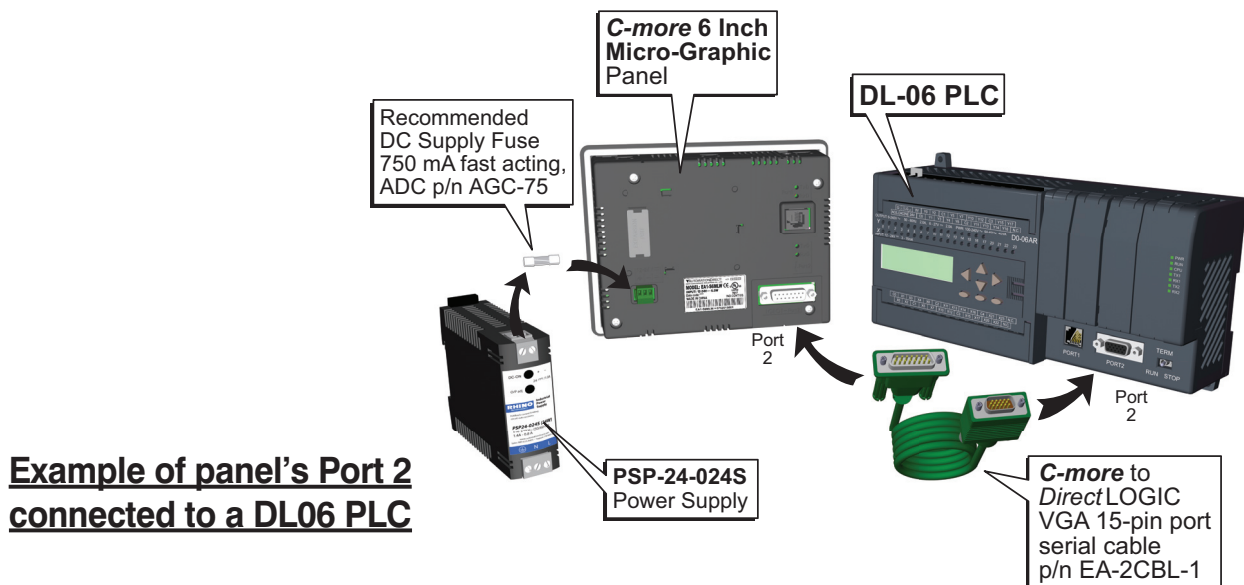


### Step 10 – Connect *C-more* 6” Micro-Graphic Panel to PLC

Connect the serial communications cable between the *C-more* Micro-Graphic panel and the PLC. The panel can be connected to the PLC via the panel's built-in RJ12 serial communications port (RS-232) or 15-pin serial communications port with either RS-232, RS-422 or RS-485 communications.



**Example of panel's Port 1 connected to a DL05 PLC**



**Example of panel's Port 2 connected to a DL06 PLC**

# SPECIFICATIONS

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## In This Chapter...



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Available Models

2

The *C-more* 6" Micro-Graphic panels expand the next generation of HMI panels brought to you by *AutomationDirect*. They have been designed to display and interchange graphical data from a PLC by viewing, using the function keys, or touching the screen.

The *C-more* 6" Micro-Graphic panel is available in two models to suit your application. Refer to the following table for part numbers, descriptions and general specifications. See **Chapter 3: Accessories** for details on the available accessories for the *C-more* 6" Micro-Graphic panels.

Micro-Graphic Panels		
Part Number		Description
EA1-S6ML		6-inch <i>C-more</i> Micro-Graphic Touch Panel with STN LCD monochrome, 320x240 dot display. Has 2 LED backlights (5 color, red, green, amber, lime, and yellow), 5 user-defined function keys with LED indicators. 2 built in serial Ports (RS-232 RJ12 port and 15 pin D-sub RS-232/422/485). NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).
EA1-S6MLW		6-inch <i>C-more</i> Micro-Graphic Touch Panel with STN LCD monochrome, 320x240 dot display. Has 2 LED backlights (5 color, white, pink1, pink2, pink3, and red), 5 user-defined function keys with LED indicators. 2 built in serial Ports (RS-232 RJ12 port and 15 pin D-sub RS-232/422/485). NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).

C-more 6" Micro-Graphic Panel



C-more 6" Micro-Graphic Panels Installed in Landscape and Portrait Keypad Bezels



## Model Specifications

Specifications	
<b>Description:</b>	320 x 240 dots LCD display(Landscape Mode), five user defined keypad function buttons, and five user defined LEDs
<b>Display:</b>	
• Type	5.7" STN monochrome LCD, graphical characters
• Resolution	320 (W) x 240 (H) dots (Landscape Mode) 240 (W) x 320 (H) dots (Portrait Mode)
• Color	2 colors (normal / inverse)
• Viewing Area Size	4.614" (W) x 3.480" (H) [117.2 mm x 88.4 mm]
• Active Area Size	4.535" (W) x 3.400" (H) [115.2 mm x 86.4 mm]
• Contrast	Adjusted from the panel's built-in configuration setup menu
• Viewing Angle	3, 9 o'clock axis → 45 degrees 6 o'clock axis → 40 degrees 12 o'clock axis → 20 degrees
<b>Backlight:</b>	
• Type	LED
• Color	Model EA1-S6ML : 5 user defined colors: Red, Green, Amber, Lime, and Yellow
	Model EA1-S6MLW: 5 user defined colors: White, Pink1, Pink2, Pink3 and Red
• User Replaceable	No
<b>Touch Screen:</b>	
•Type	Analog touch panel
• Operation	82 gram force [0.8 N] maximum
• Life	Minimum of 1,000,000 cycles
<b>Features:</b>	
• User Memory	1792 kBytes
• Number of Screens	Up to 999 – limited by project memory usage
• Beep (Internal)	Yes
• Keypad Function Buttons	Five user defined function key push buttons with the ability to label. Minimum of 500,000 cycles
• Keypad Function Button LEDs	Each function key button includes a red LED that can be user programmed.
• Serial Communications	Built-in RJ12 serial communications port (RS-232) and 15-pin D-sub serial communications port (RS-232, RS-485/422).
• Expansion Connection	Yes – used with optional Keypad Bezels, EA-MG6-BZ2 & EA-MG6-BZ2P.

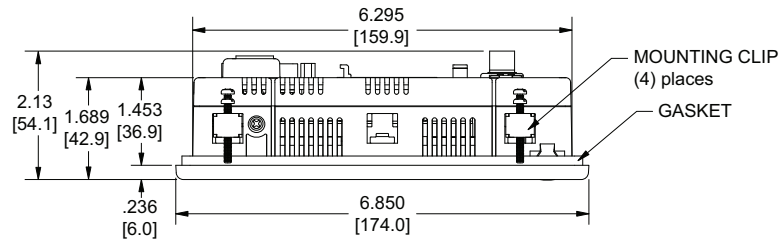
Specification table continued at the top of the next page.

## Model Specifications (cont'd)

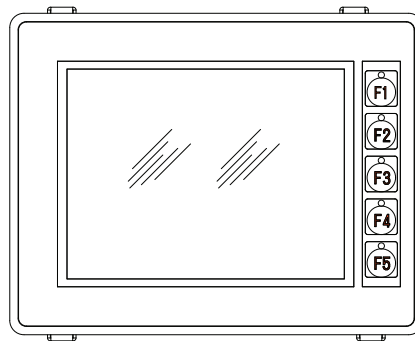
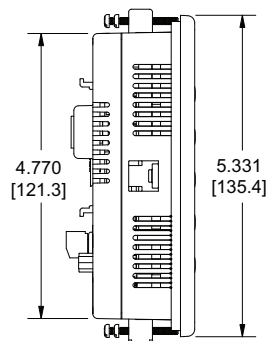
Specifications (cont'd)		
Screen Objects:		
• Functional Devices	Push Button, Switch, Indicator Button, Indicator Light, Graphic Indicator Light, Numeric Display, Numeric Entry, Inc/Dec Value, Bar Graph, Bitmap Button, Static Bitmap, Dynamic Bitmap, Recipe Button, Static Text, Lookup Text, Dynamic Text, Screen Change Push Button, Screen Selector, Adjust Contrast, Function, Real Time Graph, Line Graph, Analog Meter.	
• Static Shapes	Lines, Rectangles, Circles and Frames	
• Displayable Fonts	Fixed fonts: 6x6, 6x8, 8x16, 16x16, 32x16, 32x32, and Windows fonts	
Electrical:		
	Low Power Mode	High Power Mode
• Input Voltage Range	5.0 VDC (4.75 – 5.25 VDC)	12/24 VDC (10.2 – 26.4 VDC)
• Input Power	Supplied through the panel's RJ12 serial communications port connection when used with most AutomationDirect PLCs having a RJ12 communication port or from a PC during programming.	Supplied from an external 12-24 VDC power source
• Power Consumption	1.05 W @ 5 VDC (210 mA)	6.5 W @ 10.2 VDC (630 mA), 12 VDC (540 mA), 24 VDC (250 mA)
• Recommended Fuse	No fuse required when directly connected to a PLC or PC with recommended cable.	Type AGC fast acting glass fuse, 750 mA, 250 VAC, ADC p/n AGC-75
• Max. Inrush Current	1 A for 500 μs	10 A for 500 μs
• Acceptable External Power Drop	Maximum 1 ms	
Environmental:		
• Operating Temperature	0 to 50 °C (32 to 122 °F)	
• Storage Temperature	–20 to +60 °C (–4 to +140 °F)	
• Humidity	5–95% RH, non-condensing	
• Environmental Air	No corrosive gases permitted	
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)	
• Noise Immunity	NEMA ICS3-304 RFI, (145 MHz, 440 Mhz 10 W @ 10 cm) Impulse 1000 V @ 1 μs pulse	
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)	
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382	
Physical:		
• Dimensions	6.850" (W) x 5.331" (H) x 2.13" (D) [174.0 mm x 135.4 mm x 54.1 mm] (Landscape Mode) 5.331" (W) x 6.850" (H) x 2.13" (D) [135.4 mm x 174.0 mm x 54.1 mm] (Portrait Mode)	
• Enclosure Mounting Thickness Range	0.04" – 0.2" [1 – 5 mm]	
• Mounting Clip Screw Torque Range	21 – 28 oz-in [0.15 – 0.2 Nm]	
• Depth from bezel rear	1.894" [47.1 mm]	
• Weight	30.69 oz. (870 g)	

# Panel Dimensions

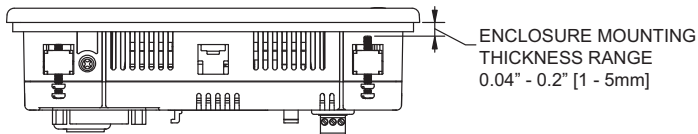
## Panel Dimensions



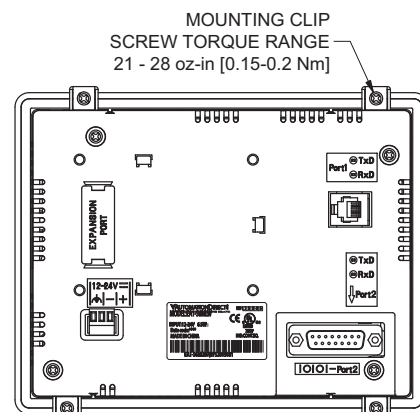
Units: Inches [mm]



## Enclosure Thickness

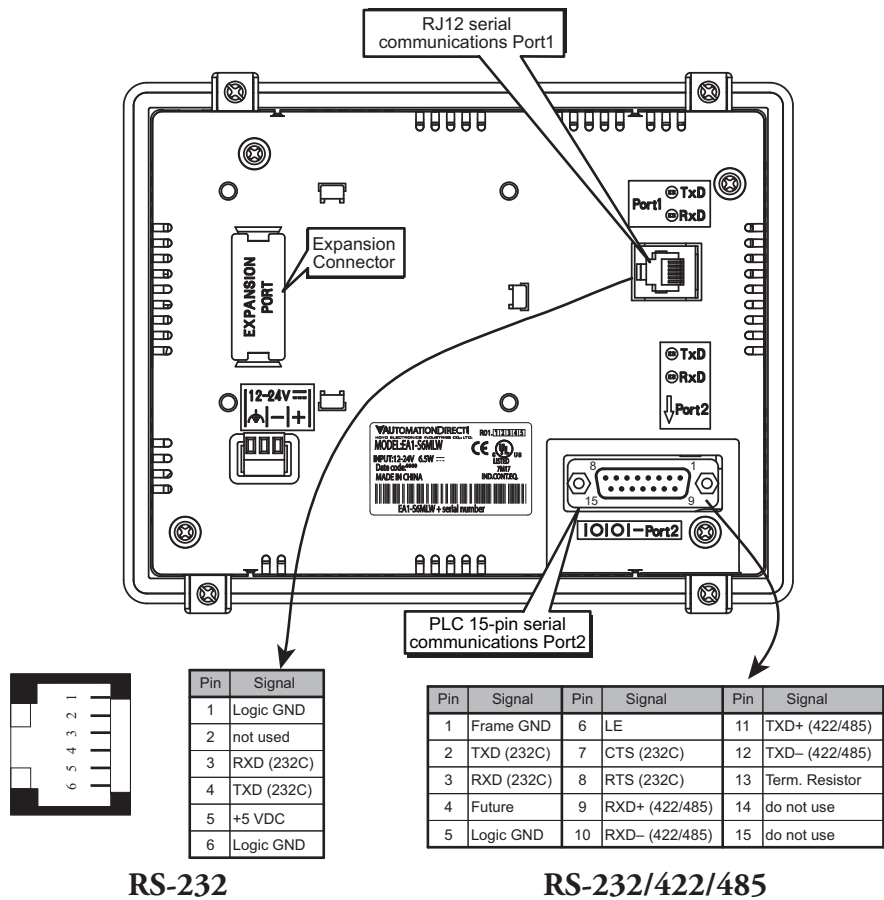


## Mounting Clip Screw Torque



Communications Ports

2



**NOTE:** The panel has one built-in RJ12 serial communications port (Port1 - RS-232) and one 15-pin serial communications port (Port2 - RS-232/422/485). **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port2 to communicate with the connected PLC, Port1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## Chemical Compatibility

The *C-more* Micro-Graphic panels are built of three different materials that may be exposed to elements outside of the enclosure. The panel's screen has a polyester (PET) surface. The bezel uses ABS plastic materials and the panel's gasket is a silicone rubber material. The following tables are provided to make you aware of the general compatibility between chemicals that may be present in your work environment and the various materials used in the manufacture of the panel. Use the table to determine those chemicals that are safe to use around your *C-more* Micro-Graphic panel and those that may harm it. The tables rate these chemicals as either Excellent, Good, Not Recommended, or Not Usable. Because the ratings are for ideal conditions at room temperature, consider all factors when evaluating your application. Areas left blank have not been tested by the manufacturer and therefore information of compatibility is not available.

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Acetaldehyde		Not Recommended		
Acetic Acid		[10, 20 °C] Excellent		
		[10, 20 °C] Excellent		
		[50, 20 °C] Not Usable		
		[50-70, 20 °C] Not Usable		
		[100, 20 °C] Not Usable		
Acetic anhydride		Not Recommended		
Acetone	Not Usable	Not Usable		Excellent
Acetophenone		Not Usable		
Acetylene		Excellent		
Acrylonitrile		Not Recommended		
Alcohol - Butyl Ether			Excellent	
Alcohol - Ethanol			Excellent	
Alcohol - Isopropyl			Excellent	
Alums NH <sub>3</sub> , Cr, K		Excellent		
Aluminum acetate		Excellent		
Aluminum bromide		Good		
Aluminum chloride		Good		
Aluminum nitrate		Excellent		
Aluminum sulfate		Excellent		
Ammonia [anhydrous]		Good		
Ammonia gas [cold]		Good		

Table continued at top of next page.



## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Ammonia liquid		Good		
Ammonia water		[12%] Not Usable		
		[28%] Not Usable		
Ammonium carbonate		Excellent		
Ammonium chloride		Excellent		
Ammonium hydroxide [ammonia water]		Excellent		
Ammonium nitrate		Excellent		
Ammonium persulfate		Excellent		
Ammonium phosphate		Excellent		
Ammonium sulfate		Excellent		
Amyl acetate		Not Usable		
Amyl alcohol		Good		
Aniline dyes		Not Recommended		
Animal oil [lard]		Good		
Aqua regia		Not Usable		
Arsenic acid		Not Recommended		
Asphalt		Excellent		
Barium chloride		Excellent		
Barium hydroxide		Excellent		
Barium sulfate		Excellent		
Barium sulfide		Excellent		
Beer		Excellent		
Beet sugar liquors		Excellent		
Benzaldehyde		Not Recommended		
Benzene [Benzol]		Not Recommended		
Benzene				Excellent
Benzine		Not Usable	Not Usable	
Benzyl alcohol		Not Recommended		
Benzyl benzoate		Not Usable		
Benzyl chloride		Not Usable		
Borax		Excellent		
Boric acid		Good		
Bromine		Not Usable		

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet–PET [Density %, Temperature °C]
Butane		Excellent		
Butter		Good		
Butyl acetate		Not Usable		
Butyl acrylate		Not Usable		
Butyl alcohol		[Butanol] Good		
Butyl Cellosolve	Not Usable			
Calcium acetate		Excellent		
Calcium bisulfite		Good		
Calcium chloride		Excellent		
Calcium hydroxide		Excellent		
Calcium hypochlorite		[20, 20 °C] Excellent		
Calcium nitrate		Excellent		
Calcium sulfide		Excellent		
Cane sugar liquors		Excellent		
Carbon dioxide		Excellent		
Carbon disulfide		Not Usable		
Carbonic acid		Good		
Carbon tetrachloride		Not Usable		Excellent
Castor oil		Not Recommended		
China wood [tung] oil		Excellent		
Chlorine gas [dry]		Not Usable		
Chlorine gas [wet]		Not Usable		
Chlorine liquid		Not Usable		
Chlorinated solvents		Not Usable		
Chloroacetic acid		Not Usable		
Chloroacetone		Not Usable		
Chloroform		Not Usable		Excellent
Chlorophenol				Not Usable
Chlorosulfonic acid		Not Usable		
Chlorotoluene		Not Usable		
Chromic acid		[2, 70 °C] Not Usable		
		[5, 70 °C] Not Usable		
		[10, 70 °C] Not Usable		
		[25, 70 °C] Not Usable		

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## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Citric acid		Good		
Cocoonut oil		Good		
Concentrated HCl	Excellent			
Copper chloride		Excellent		
Copper cyanide		Excellent		
Copper sulfate		Excellent		
Corn oil		Good		
Cottonseed oil		Good		
Creosol		Not Usable		
Cyclohexane		Good		
Cyclohexanol		Good		
Cyclohexanone	Not Usable	Not Usable		
Developing solutions [Hypos]		Excellent		
Dibutyl phthalate [DBP]		Not Usable		
Dichlorobenzene		Not Usable		
Diethylene glycol		Good		
Diethyl ether		Not Usable		
Disopropyl ketone		Not Usable		
Dimethyl aniline		Not Usable		
Dimethyl formamide		Not Usable		
Dioxane		Not Usable		
Dipentene		Not Usable		
Epichlorohydrine		Not Usable		
Ethyl acetate	Not Usable	Not Usable		Excellent
Ethyl acetoacetate		Not Usable		
Ethyl acrylate		Not Usable		
Ethyl alcohol		Not Recommended		Excellent
Ethyl benzene		Not Usable		
Ethyl chloride		Not Usable		
Ethylene chlorohydrin		Not Usable		
Ethylene diamine		Not Usable		
Ethylene dichloride		Not Usable		
Ethylene glycol		Excellent		

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## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Ethylene oxide		Not Usable		
Fatty acid		Good		
Ferric chloride		Excellent		
Ferric nitrate		Excellent		
Ferric sulfate		Excellent		
Fluorboric acid		Not Recommended		
Fluorobenzene		Not Usable		
Fluosilicic acid		Not Recommended		
Formaldehyde		[40, 20 °C] Good		
		[25, 20 °C] Excellent		
		[50, 20 °C] Good		
		[90, 20 °C] Not Recommended		
Freon				[45° C] Excellent
Freon 11		Not Recommended		
Freon 12		Good		
Freon 113		Not Usable		
Freon 114		Not Recommended		
Fuel oil		Good		
Gasoline	Excellent	Not Recommended	Not Usable	
Gelatin		Excellent		
Glauber's salt		Excellent		
Glue		Excellent		
Glycerin		Excellent		
Grease		Excellent		
Hexane		Not Recommended		
Hexyl alcohol		Good		
Hydrobromic acid		[20, 20 °C] Not Usable		
		[20-70, 20 °C] Not Usable		
		[37, 20 °C] Not Usable		
Hydrochloric acid		[10, 20 °C] Excellent	Good	[15%] Excellent
		[20, 20 °C] Good		
		[20-80, 20 °C] Not Recommended		
		[38, 20 °C] Not Recommended		[30%] Good

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Hydrocyanic acid		Excellent		
Hydrofluoric acid		[10, 20 °C] Excellent		
		[20, 20 °C] Excellent		
		[40, RT] Good		
Hydrofluoric acid anhydrous		Not Usable		
Hydrogen		Excellent		
Hydrogen peroxide		[5, 20 °C] Not Recommended		
		[5-50, 20 °C] Not Recommended		
		[30, 20 °C] Not Usable		
Hydrogen sulfide		Excellent		
Hydroquinone		Not Recommended		
Hypochlorous acid		Not Recommended		
Isobutyl alcohol		Good		
Isopropyl acetate		Not Usable		
Isopropyl alcohol	Excellent	Good		
JP fuels (1-6)		Good		
Kerosene		Good		
Lacquer		Not Usable		
Lactic acid		Excellent		
Lard		Excellent		
Lead acetate		Excellent		
Lead nitrate		Good		
Lead sulfamate		Good		
Linoleic acid		Excellent		
Linseed oil		Excellent		
Liquified petroleum gas [LPG]		Excellent		
Lubricating oil		Excellent		
Lye solution		Excellent		
Magnesium chloride		Excellent		
Magnesium hydroxide		Excellent		
Magnesium sulfate		Excellent		
Maleic acid		Excellent		

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
<b>Mercuric chloride</b>		Excellent		
<b>MEK</b>	Not Usable			Good
<b>Mercury</b>		Excellent		
<b>Metacresol</b>				Not Usable
<b>Methyl acetate</b>		Not Usable		
<b>Methyl alcohol</b>		Not Recommended		Excellent
<b>Methyl Benzoate</b>				Not Usable
<b>Methyl chloride</b>	Not Usable	Not Usable		
<b>Methyl ethyl ketone [MEK]</b>		Not Usable		
<b>Methyl isobutyl ketone [MIBK]</b>		Not Usable		
<b>Methyl methacrylate</b>		Not Usable		
<b>Methyl dichloride</b>		Not Usable		
<b>Methyl Salicylate</b>				Not Usable
<b>Milk</b>		Excellent		
<b>Mineral oil</b>		Excellent	Excellent	
<b>Monochlorobenzene</b>		Not Usable		Not Usable
<b>Naptha</b>		Good		
<b>Napthalene</b>		Excellent		
<b>Napthenic acid</b>		Good		
<b>Natural gas</b>		Excellent		
<b>Natural oil</b>			Excellent	
<b>Nickel acetate</b>		Excellent		
<b>Nickel chloride</b>		Excellent		
<b>Nickel sulfate</b>		Excellent		
<b>Nitric acid</b>		[10, 20 °C] Good		[30%] Good
		[10-70, 20 °C] Not Usable		
		[30, 20 °C] Not Usable		
		[30-70, 20 °C] Not Usable		[30%] Not Usable
		[61.3, 20 °C] Not Usable		
		[Vapor, RT] Not Usable		
<b>Nitrobenzene</b>		Not Usable		Not Usable
<b>Nitroethane</b>		Not Usable		
<b>Nitromethane</b>		Not Usable		

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Nitropropane		Not Usable		
Nitrogen		Excellent		
Octyl alcohol		Good		
Oleic acid		Excellent		
Olive oil		Excellent		
Oxalic acid		Excellent		
Oxygen		Excellent		
Ozone		Not Recommended		
Palmitic acid		Excellent		
Perchloroethylene		Not Usable		
Petroleum		Excellent		
Phenol		Not Usable		Not Usable
Phosphoric acid		[50, 20 °C] Good		
		[50-70, 20 °C] Not Usable		
		[75, 20 °C] Not Usable		
Pickling solution		[Sulfuric acid 20% + nitric acid 4%] Good		
		[Sulfuric acid 40% + nitric acid 15%] Not Recommended		
Pine oil		Good		
Potassium chloride		Excellent		
Potassium cyanide		Excellent		
Potassium dichromate		[10, 20 °C] Excellent		
Potassium hydroxide		Excellent		[10%] Not Usable
Potassium nitrate		Excellent		
Potassium permangante		[5, 20 °C] Excellent		
Potassium sulfate		Excellent		
Propane		Excellent		
Propyl acetate		Not Usable		
Propyl alcohol		Good		
Salt water		Excellent		
Silicone oils		Good		
Silver nitrate		Excellent		

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key Sheet – PET [Density %, Temperature °C]
Skydrol 500		Not Usable		
Skydrol 7000		Not Usable		
Soap solutions		Excellent		
Soda ash		Excellent		
Sodium bicarbonate		Excellent		
Sodium bisulfate		Good		
Sodium borate		Excellent		
Sodium carbonate				[10%] Excellent
Sodium chloride		Excellent		
Sodium cyanide		Excellent		
Sodium hydroxide		[10, 20 °C] Excellent	Good	[1%] Excellent
		[30, 20 °C] Excellent		
		[30-70, 20 °C] Not Usable		[10%] Not Usable
Sodium hydrochlorite		[5, 20 °C] Excellent		
		[5-70, 20 °C] Not Usable		
Sodium metaphosphate		Excellent		
Sodium nitrate		Excellent		
Sodium perborate		Excellent		
Sodium peroxide		Not Usable		
Sodium phosphate		Excellent		
Sodium thiosulfate		Excellent		
Sodium sulfate [Glauber's salt]		Good		
Sodium sulfite		Excellent		
Soybean oil		Excellent		
Stannic chloride		Good		
Steam		[below 150 degrees] Not Usable		
Steam		[above 150 degrees] Not Usable		
Stearic acid		Excellent		
Styrene		Not Recommended		
Sucrose solutions		Excellent		
Sulfur		Excellent		
Sulfur dioxide		Good		

Table continued at top of next page.



## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PC [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]	Bezel Key – PET [Density %, Temperature °C]
Sulfuric acid		[10, 20 °C] Excellent	Not Usable	[20%] Excellent
		[10-70, 20 °C] Not Usable		
		[30, 20 °C] Excellent		[60%] Excellent
		[30-70, 20 °C] Not Recommended		
		[98, 20 °C] Not Usable		[80%] Not Usable
		[Vapor, 20 °C] Not Usable		
Sulphurous acid		[10, 20 °C] Good		
Tannic acid		Good		
Tar		Not Recommended		
Tartaric acid		Excellent		
Terpineol		Not Recommended		
Tetrachloroethane		Not Usable		Excellent
Tetraethyl lead		Good		
Tetralin				Not Usable
Tetrahydrofuran		Not Usable	Not Usable	
Thionyl chloride		Not Usable		
Toluene	Not Usable	Not Usable	Not Usable	Excellent
Trichloroethylene [Trichlene]		Not Usable		
Triethanol amine		Good		
Turpentine oil		Good		
Vegetable oil		Good		
Vinegar		Excellent		
Water	Excellent	Excellent		
Whiskey		Excellent		
Xylene	Not Usable	Not Usable		Excellent
Zeolites		Excellent		
Zinc acetate		Excellent		
Zinc chloride		Excellent		
Zinc sulfate		Excellent		

# ACCESSORIES

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## CHAPTER 3


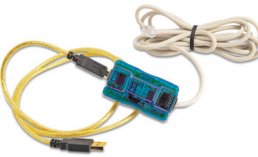
### In This Chapter...

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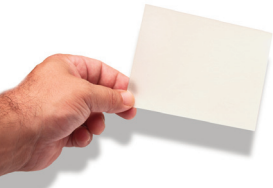
## Accessories

3

### Micro-Graphic Programming Software & Programming Cable

Part Number		Description
EA-MG-PGMSW		<b>C-more</b> Micro-Graphic panel Windows-based configuration software. Requires Windows 2000 with Service Pack 4, XP Home or Professional with Service Pack 2 or Windows Vista. Requires USB port connection from PC to touch panel. Includes CD-ROM. Programming cable (EA-MG-PGM-CBL) sold separately. Downloadable version available from the Web site at no charge. Software Help Files included in download.
EA-MG-PGM-CBL		6-ft. cable assembly to connect personal computer to any <b>C-more</b> Micro-Graphic panel for setup and programming. (Note: This cable assembly uses the PC's USB port and converts the signals to serial transmissions. The USB port supplies 5 VDC to the Micro-Graphic panel for low-power mode configuration operations). Assembly includes standard USB A-type connector to B-type connector cable, custom converter, and an RS232C cable with RJ12 modular connector on each end.

### Micro-Graphic Panel Accessories

Part Number		Description
EA-MG6-BZ2		For Landscape (Horizontal) Mounted Panels. 20-button keypad bezel with numeric keypad for <b>C-more</b> 6" Micro-Graphic panels, 4 arrow adjust keys, and ESCAPE, MENU, CLEAR and ENTER buttons. Helps to reduce screen wear in heavy-duty applications where operators can use the keypad to enter numeric data. Designed for easy drop-in of the Micro-Graphic panels.
EA-MG6-BZ2P		For Portrait (Vertical) Mounted Panels. 21-button keypad bezel with numeric keypad for <b>C-more</b> 6" Micro-Graphic panels, 4 arrow adjust keys, and ESCAPE, MENU, CLEAR and (2) ENTER buttons. Helps to reduce screen wear in heavy-duty applications where operators can use the keypad to enter numeric data. Designed for easy drop-in of the Micro-Graphic panels.
EA-6-COV2		Optional clear screen overlay used to protect <b>C-more</b> Micro-Graphic displays from minor scratches and wear. Package contains 3 clear screen overlays.

## C-more Micro-Graphic Programming Software

**C-more®** Micro-Graphic Programming Software is a spin-off of its powerful sibling **C-more** Touch Panel. It offers very high end features designed to reduce your configuration time. Simply drag and drop the objects from the object bar (right side of screen) onto the the screen construction area. Then configure your PLC tags and click on the objects you wish to use. Use the built-in simulator to review your work on your PC before ever downloading your project!



**NOTE:** Software and Firmware Version 2.0 or later is required with models EA1-S6ML and EA1-S6MLW. Available for free download at [www.automationdirect.com](http://www.automationdirect.com).

### Thumbnail project preview pane

Helps keep track of multi-screen projects.

### Built-in user object/screen libraries

Save time by re-using your custom objects and screens.

### Scrolling object selection window

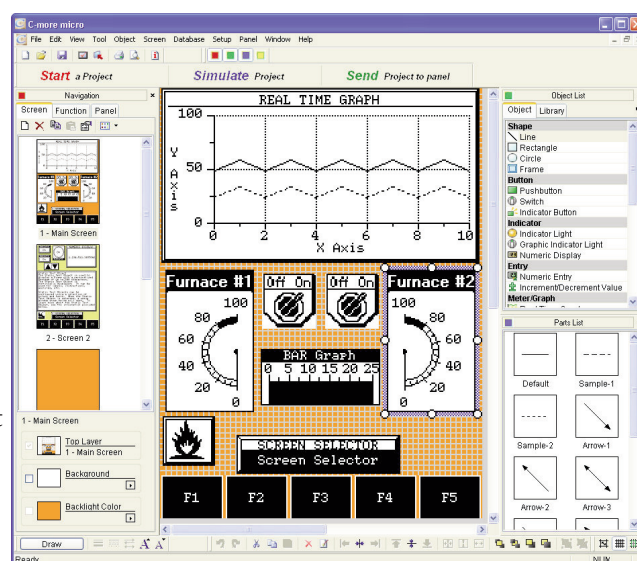
Lets you find the object you want fast. Just drag and drop it on the screen.

### Scrolling help window

Gives you helpful information on each object

### Built-in project simulator

- Runs your project on your PC
- Test all of your screens before downloading
- Time savings pays for the panel




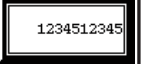

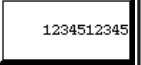



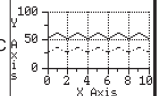
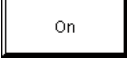
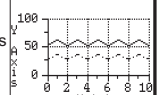
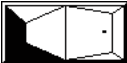

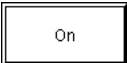

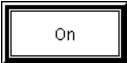



### PC Requirements:

Following are the minimum system requirements for running **C-more** Micro-Graphic Programming Software, EA-MG-PGMSW, on a PC:

- USB port for project transfer from software to touch panel
- Personal Computer with a 333 MHz or higher processor (CPU) clock speed recommended; (Windows® 2000 with Service Pack 4 or Windows® XP, 800 MHz or higher processor (CPU) clock speed recommended (Windows® Vista (32 bit)); Intel® Pentium/Celeron family, or AMD® K6/Athlon/Duron family, or compatible processor recommended
- Keyboard and Mouse or compatible pointing device
- Super VGA color video adapter and monitor with at least 800 x 600 pixels resolution (1024 x 768 pixels recommended) 64K color minimum
- 150 MB free hard-disk space
- 128 MB free RAM (512 MB recommended)
- CD-ROM or DVD drive for installing software from the CD or internet access to download
- Operating System - Windows® XP Home / Professional Edition with Service Pack 2, Windows® 2000 with Service Pack 4 or Windows® Vista




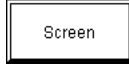



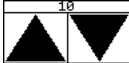
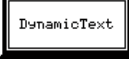



## Micro-Graphic Programming Software (cont'd)

<i>C-more</i> Micro-Graphic Panel Objects			
Object	Graphic	Object	Graphic
The <b>Line</b> object, just like with drawing tools, allows the user to insert a straight line drawing into a project. When a Line is inserted into a project, a window opens to allow the user to setup all available parameters for the Line object. Some of the uses for Line Objects include but are not limited to adding callouts, pointers, or indicators.		The <b>Numeric Display</b> consists of a frame that displays a real-time numeric value according to the value of data received from an assigned Tag Name. The Numeric Display supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal point. User Defined Alpha Numeric Prefix and Suffix values are also supported.	
The <b>Rectangle</b> object, just like with drawing tools, allows the user to insert a drawing of a Rectangle as well as other geometric shapes into a project. When this object is inserted into a project, a window opens to allow the user to setup all available parameters for the Rectangle object.		The <b>Numeric Entry</b> object is used to enter a value from your Panel to a PLC Register. This object, when selected, opens a Numeric Keypad that allows the user to enter a new value that will be written to the assigned Tag Name. The Numeric Entry supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal points. User Defined Alpha Numeric Prefix and Suffix values are also supported.	
The <b>Circle</b> object, just like with drawing tools, allows the user to insert a drawing of a Circle or ellipse shape into a project. When this object is inserted into a project, a window opens to allow the user to setup all available parameters for the Circle object.		The <b>Increment/Decrement Value</b> object is used to add or subtract a value by pressing a button on the Panel. Basically the object uses two Tags, one to read a value from and another to write a modified value to. The Increment/Decrement Value supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal points. The Increment and decrement values are also user selectable.	
The <b>Frame</b> object allows the user to insert a Frame to the project that can be used to Frame other objects. Some of the uses for Frame object include but are not limited to graphically separating objects for different operations that may appear on one screen and emphasizing pushbuttons or other objects that may require more attention by the operator.		The <b>Real Time Graph</b> object displays the value stored in up to two PLC tags, over a history of up to 24 points each.	
The <b>Pushbutton</b> object is available from the Button Category of the Object List window. The Pushbutton object is an electronic version of a typical Pushbutton normally found on control panels. The Pushbutton object can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Line Graph</b> object displays the values of up to 24 PLC address points. Up to two address arrays can be displayed.	
The <b>Switch</b> object is an electronic version of a typical Switch that normally can be found on control panels. The Switch object can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Analog Meter</b> object is used to display the current value of a Tag Name.	
The <b>Indicator Button</b> object is available from the Button Category of the Object List window. The Indicator Button object is an electronic version of a typical Indicator Button normally found on control panels. The Indicator Button is a combination of a Pushbutton and an Indicator Light. The Indicator Button can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Bar Meter</b> object is used to monitor up to two assigned Tag Names continuously. This object has various appearances depending upon the relative value of the tags. The Bar Meter can be used to create digital versions of level, current, and flow meters to name a few samples, or gauges that measure speed and other measurable data.	
The <b>Indicator Light</b> object is an electronic version of a typical Indicator Light normally found on industrial control panels. The Indicator Light can be configured to display the status of the assigned Discrete Tag Name.		The <b>Bitmap Button</b> object offers the ability to use a Bitmap graphic to perform the functions of a Button. This allows users to create their own graphics and implement them within the software project. The Bitmap Button object can be used to activate or deactivate components assigned to a Discrete Tag Name. The <i>C-more</i> Micro-Graphic display only supports two colors, black and white.	
The <b>Graphic Indicator Light</b> object is a more enhanced version of the "Indicator Light Object" that allows the user to choose more detailed graphics to display the status of a tag. This object is an electronic version of a typical Indicator Light normally found on industrial control panels. The Indicator Light can be configured to display the status of the assigned Discrete Tag Name.		The <b>Static Bitmap</b> offers the ability to display a Bitmap graphic on any screen. The Static Bitmap does not change state. Refer to the Dynamic Bitmap Object if you require the graphic object to change state based on a Tag Value in your PLC. The dialog box for a "Static Bitmap" object allows you to "read from disk" and select a graphic file for import. Graphics must be in one of the following formats: .BMP .WMF .JPG .JPEG	

*C-more* Micro-Graphic Panel Objects continued at top of next page.

## Micro-Graphic Programming Software (cont'd)

C-more Micro-Graphic Panel Objects			
Object	Graphic	Object	Graphic
<p><b>Recipe</b> objects make it easy to make a large number of tag changes with the push of a single button. Create Recipes with up to 99 entries, and multiple sets of values. Then just push a button to load an entire set of values into the group of recipe tags.</p>		<p>The <b>Scroll Text</b> object is available from the Text Category of the Object List window. The Scroll Text object is an electronic version of a marquee. It is similar to the Static Text Object. If the text in the object does not fit in the window, it will scroll from right to left across the window. The Scroll Text object does not require a Tag Name assignment. The Scroll Text Object has a maximum character limit of 128 characters.</p>	
<p>The <b>Dynamic Bitmap</b> object offers the ability to make an object using two different Bitmap graphics that will display one graphic when the Tag is On and a different graphic when the Tag is Off. Use your own bitmap designs or use some of the bitmaps provided with the software that are located in the User Graphic Library.</p>		<p>The <b>Screen Change Pushbutton</b> object is available from the Control Category of the Object List window. The Screen Change Pushbutton object is a pushbutton that can be configured to activate another screen in the project. This object may be edited to various colors and sizes. Users can configure the button to activate the Power-Up screen, Forward Screen, Previous Screen, or any one of the project screens.</p>	
<p>The <b>Static Text</b> object is used to display a Frame with a personalized Message. This Frame and Message can be placed on any screen and any location within the screen.</p>		<p>The <b>Screen Selector</b> object is available from the Control Category of the Object List window. This object is an enhanced version of the Screen Change pushbutton in that it offers many more features and defaults with data from screens in the project. This helps to save time by not having to create Screen change buttons for each screen. This object may be edited to various colors and sizes.</p>	
<p>The <b>Lookup Text</b> object is used to display a Frame with a personalized Message. This Frame and Message can be placed on any screen and any location within the screen. The object is always displayed like a sign but is configured to display only the message prompted by an assigned Tag Name. Messages are retrieved from a Message Database which is configured by the user with text defined by the user. The Lookup Text Object will scroll text up to 128 characters.</p>		<p>The <b>Adjust Display Contrast</b> object is used to allow the operator to adjust the Panel Display Contrast. The default Display setting often works in most applications, however lighting may vary based on the location of each application. In these cases the operator can use this object to make adjustments. The current display setting value will appear on the top of the button and will change as the arrow keys are pressed. This button can be modified to various sizes.</p>	
<p>The <b>Dynamic Text</b> object is used to display text that is retrieved from data stored in a Tag. The Tag Name is assigned to registers in the PLC that contain set character data. The data can be stored in the PLC in ASCII format and may include information such as machine numbers, locations, part numbers, and such. The Message can be configured to be visible (Trigger) when an associated Tag Name is On or Off. This object can be placed on any screen and any location within the screen. The Dynamic Text Object will scroll text up to 40 characters.</p>		<p>The <b>Function</b> object is used to assign the panels function key buttons to a particular action as well as assigning the control of the LED On/Off status. When a button has been assigned as a shift button, the then F1 through F5 will become F6 through F10. The Function Object buttons will activate when the hardware button is pressed or when the object is pressed on the screen. The object size is restricted so that the keys will line up with the hardware function keys on the panel.</p>	

3



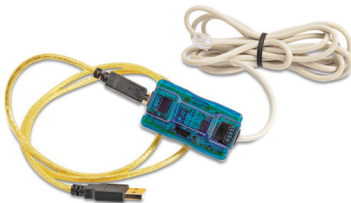
## USB to RS-232 Programming Cable Assembly

Using the *C-more* Micro-Graphic Programming Software for project development, the *C-more* 6" Micro-Graphic panel can be connected to a PC (personal computer) by using the USB-to-RS-232 cable assembly, part number EA-MG-PGM-CBL.

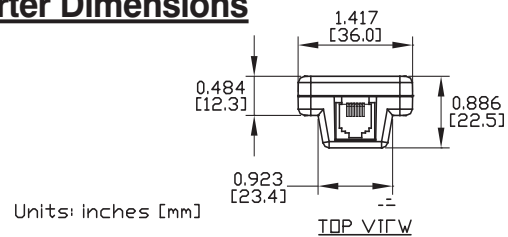
- Connect the USB programming cable ( included) from a USB port type A on the PC to the USB type B port on the converter (included). Next connect the serial programming cable from the converter's RJ12 port to the panel's RJ12 serial port. The panel receives power from the USB port of the PC that it is connected to through the USB to RS-232 converter assembly.

**NOTE:** Install *C-more* Micro-Graphic Programming software before connecting the panel to the PC to ensure the panel drivers install correctly.

### EA-MG-PGM-CBL

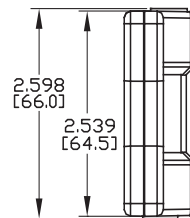
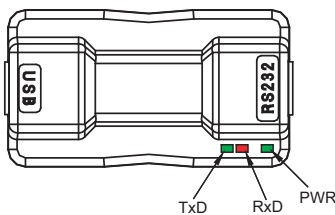


### Converter Dimensions

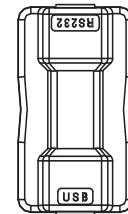


### Converter Status LEDs

LED Status Indicators

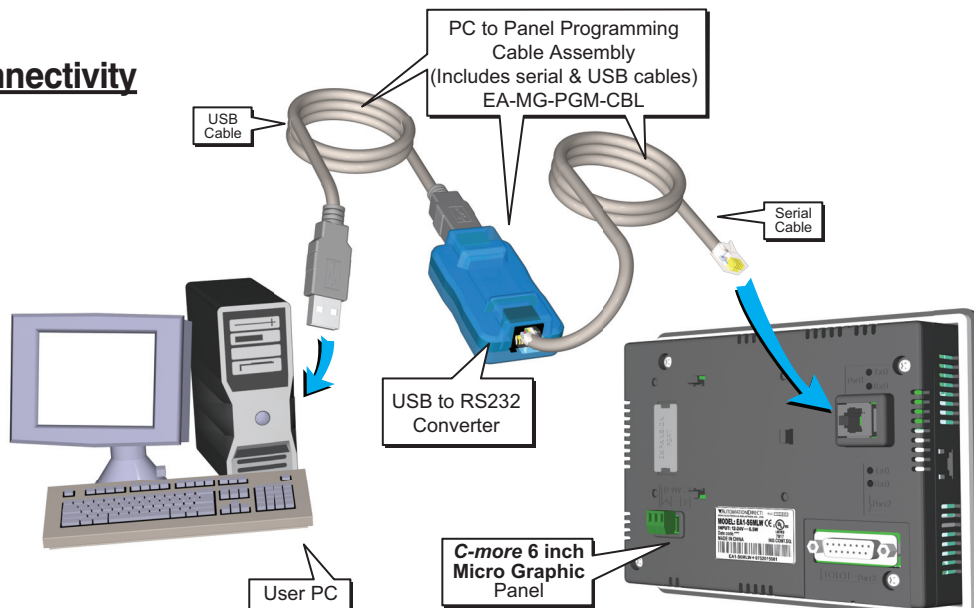


LEFT VIEW



FRONT VIEW

### USB Connectivity



USB to RS-232 Programming Cable Assembly continued at top of next page.

## USB to RS232 Programming Cable Assembly (cont'd)

USB to RS232 Converter Specifications	
<b>Part Number:</b>	<b>EA-MG-PGM-CBL</b>
<b>Description:</b>	6-ft. cable assembly to connect personal computer to any <b>C-more</b> Micro-Graphic panel for setup and programming. (Note: This cable assembly uses the PC's USB port and converts the signals to serial transmissions. The USB port supplies 5 VDC to the <b>C-more</b> Micro-Graphic panel for low-power mode configuration operations.) Assembly includes standard USB A-type connector to B-type connector cable, custom converter, and an RS232C cable with RJ12 modular connector on each end.
<b>Hardware:</b>	
• <b>USB Interface</b>	USB Specification Rev. 1.1 Connector: USB Type B jack to accept USB Type B cable plug
• <b>Serial Interface</b>	RS232 (EIA-232-E) Connector: RJ12 phone jack 6p to accept RJ12 cable plug
• <b>Baud Rate</b>	115.2 kbps Maximum
• <b>Input Voltage</b>	5 VDC (Supplied thru serial interface cable.)
• <b>Power Consumption</b>	50 mA (Does not include power to panel and/or bezel.)
<b>Accessory Cables:</b>	
• <b>USB Cable</b>	USB Type A plug to PC on one end, USB Type B plug to converter on other end, 0.30 m [1 foot] length (* Note)
• <b>Serial Cable</b>	RJ12 phone plug connectors on both ends, 2.0 m [6.56 feet] length (* Note)
<b>Environmental:</b>	
• <b>Operating Temperature</b>	0 to 50 °C (32 to 122 °F)
• <b>Storage Temperature</b>	-20 to 60 °C (-4 to 140 °F)
• <b>Humidity</b>	5 to 95 % RH (non-condensing)
• <b>Environmental air</b>	No corrosive gases permitted
• <b>Vibration</b>	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, sweeping, at a rate of 1 octave/min. (±10%), 10 sweep cycles per axis on each of 3 mutually perpendicular axes
• <b>Shock</b>	IEC60068-2-27 (Test Ea), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
<b>Physical:</b>	
• <b>Dimensions</b>	2.559" (W) x 1.417" (H) x 0.886" (D) [65.0 mm x 36.0 mm x 22.5 mm]
• <b>Weight</b>	1.06 oz. [30 g]
<b>* Note: Maximum cable length for either the USB or serial cable should not exceed 2.0 m [6.56 feet] in length.</b>	



## 20-Button Landscape (Horizontal) Keypad Bezel

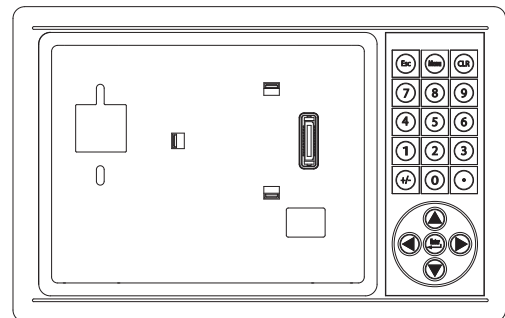
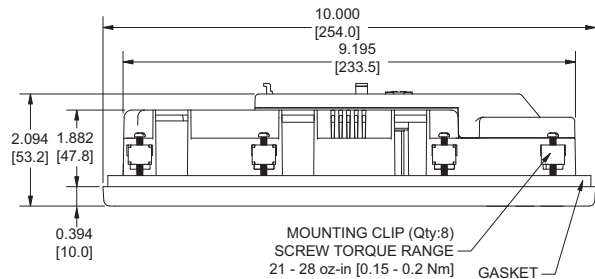
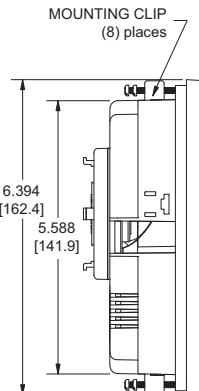
The 20-button keypad bezel is designed to be used with the *C-more* 6" Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, a full numeric keypad, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object to allow changing of a value, and can also be used to navigate & select screen objects. The numeric buttons can be used to enter a new value, or use the cursor left and right buttons to select a digit and the cursor up and down buttons to change the value, along with the ENTER and CLEAR buttons. It can also be used to access and navigate the screen selector feature. The keypad bezel is designed for easy drop-in of a *C-more* 6" Micro-Graphic panel. No panel configuration is required.

### EA-MG6-BZ2

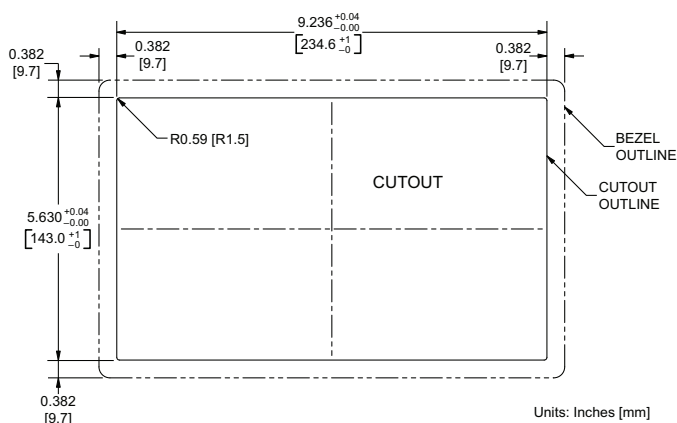


### Dimensions

Units: Inches [mm]

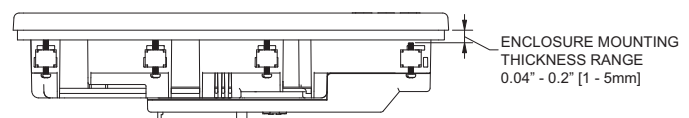


### Panel Cutout



Four directional cursor buttons, numeric buttons and ESC, MENU, CLEAR and ENTER buttons.

### Panel Thickness



20-Button Keypad Bezel continued at top of next page.

## 20-Button Landscape (Horizontal) Keypad Bezel (cont'd)

20-Button Keypad Bezel Specifications	
Part Number:	EA-MG6-BZ2
General:	
• Micro-Graphic Panels Supported	EA-S6ML, EA-S6MLW
• Connection	Connects with expansion connector on the rear of the <b>C-more</b> 6" Micro-Graphic panel.
• Power Consumption	None
• Keypad Button Life	Minimum of 500,000 cycles
• Enclosure Mounting	(8) mounting clips, EA-MG-BZ2-BRK, included. Note: The <b>C-more</b> 6" Micro-Graphic panel is installed into the keypad bezel using the (4) mounting clips, EA-MG-BZ2-BRK, that are supplied with the panel.
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	NEMA ICS3-304 RFI, (145 MHz, 440 Mhz 10 W @ 10 cm) Impulse 1000 V @ 1 µs pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	10.000" (W) x 6.394" (H) x 2.488" (D) [254.0 mm x 162.4 mm x 63.2 mm]
• Weight	26.1 oz. [740 g]

*C-more 6" Micro Graphic Panel  
being installed in a 20 button  
Keypad bezel EA-MG6-BZ2*



20-Button Keypad Bezel continued at top of next page.

## 20-Button Horizontal (Landscape) Keypad Bezel (cont'd)

### Panel and 20-Button Keypad Bezel Assembly

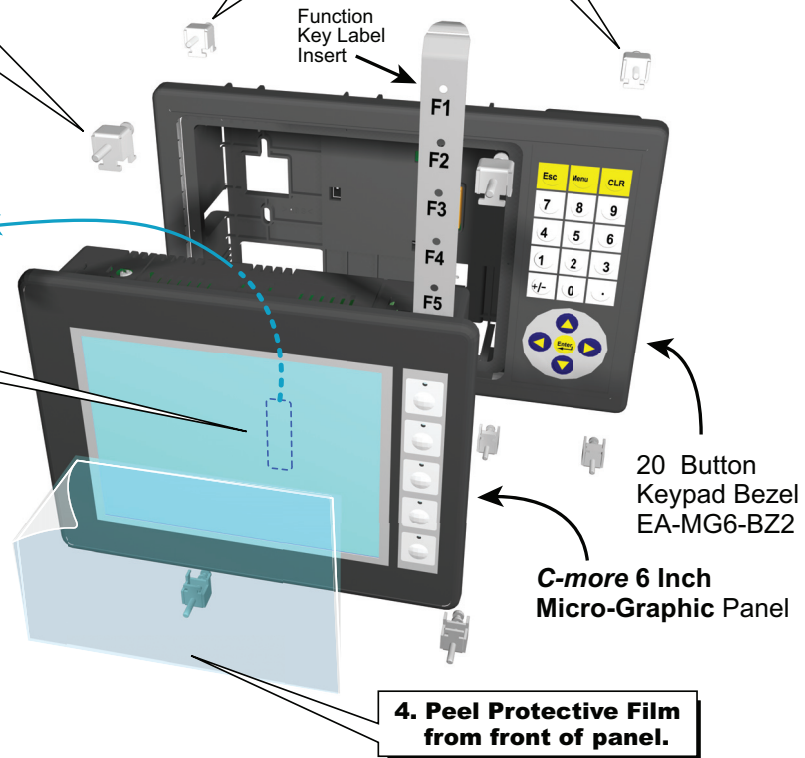
3

**2.** Use the (4) Panel Mounting Clips, EA-MG-BZ2-BRK, that are supplied with the panel, to secure panel to keypad bezel and compress the gasket between the panel and the keypad bezel. Tighten screws to a torque of 21-28 oz-in [0.15-0.2 Nm].

**3.** Use (8) Bezel Mounting Clips, EA-MG-BZ2-BRK, to secure keypad bezel through enclosure cutout. Tighten screws to a torque of 21-28 oz-in [0.15-0.2 Nm].

**1.** Remove Expansion Connector Protective Cover from rear of panel.

**4.** Peel Protective Film from front of panel.



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

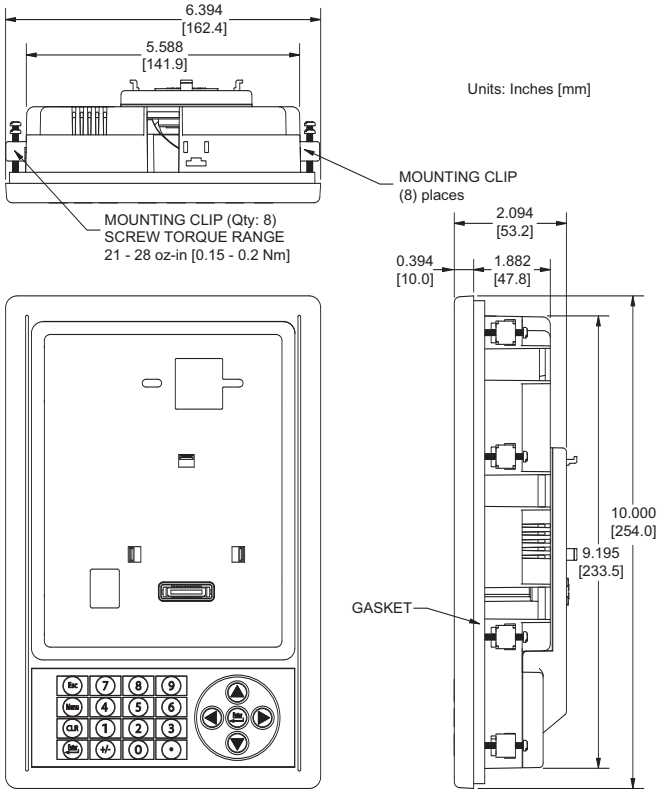
# 21-Button Portrait (Vertical) Keypad Bezel

The 21-button keypad bezel is designed to be used with the *C-more* 6" Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, a full numeric keypad, and one each of an ESCAPE, MENU, CLEAR and two ENTER buttons. The keypad is intended to be used with the numeric entry object to allow changing of a value, and can also be used to navigate & select screen objects. The numeric buttons can be used to enter a new value, or use the cursor left and right buttons to select a digit and the cursor up and down buttons to change the value, along with the ENTER and CLEAR buttons. It can also be used to access and navigate the screen selector feature. The keypad bezel is designed for easy drop-in of a *C-more* 6" Micro-Graphic panel. No panel configuration is required.

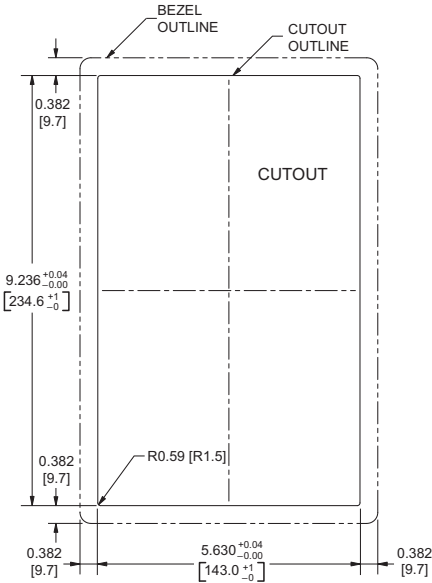
## EA-MG6-BZ2P



## Dimensions

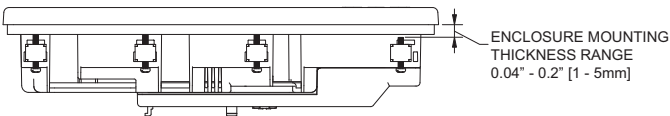


## Panel Cutout



Four directional cursor buttons, numeric buttons, and ESC, MENU, CLEAR and two ENTER buttons.

## Panel Thickness



21-Button Keypad Bezel continued at top of next page.

## 21-Button Vertical (Portrait) Keypad Bezel (cont'd)

21-Button Keypad Bezel Specifications	
Part Number:	EA-MG6-BZ2P
General:	
• Micro-Graphic Panels Supported	EA-S6ML, EA-S6MLW
• Connection	Connects with expansion connector on the rear of the <b>C-more</b> 6" Micro-Graphic panel.
• Power Consumption	None
• Keypad Button Life	Minimum of 500,000 cycles
• Enclosure Mounting	(8) mounting clips, EA-MG-BZ2-BRK, included. Note: The <b>C-more</b> 6" Micro-Graphic panel is installed into the keypad bezel using the (4) mounting clips, EA-MG-BZ2-BRK, that are supplied with the panel.
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	NEMA ICS3-304 RFI, (145 MHz, 440 Mhz 10 W @ 10 cm) Impulse 1000 V @ 1 µs pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	6.394" (W) x 10.000" (H) x 2.488" (D) [162.4 mm x 254.0 mm x 63.2 mm]
• Weight	26.1 oz. [740 g]

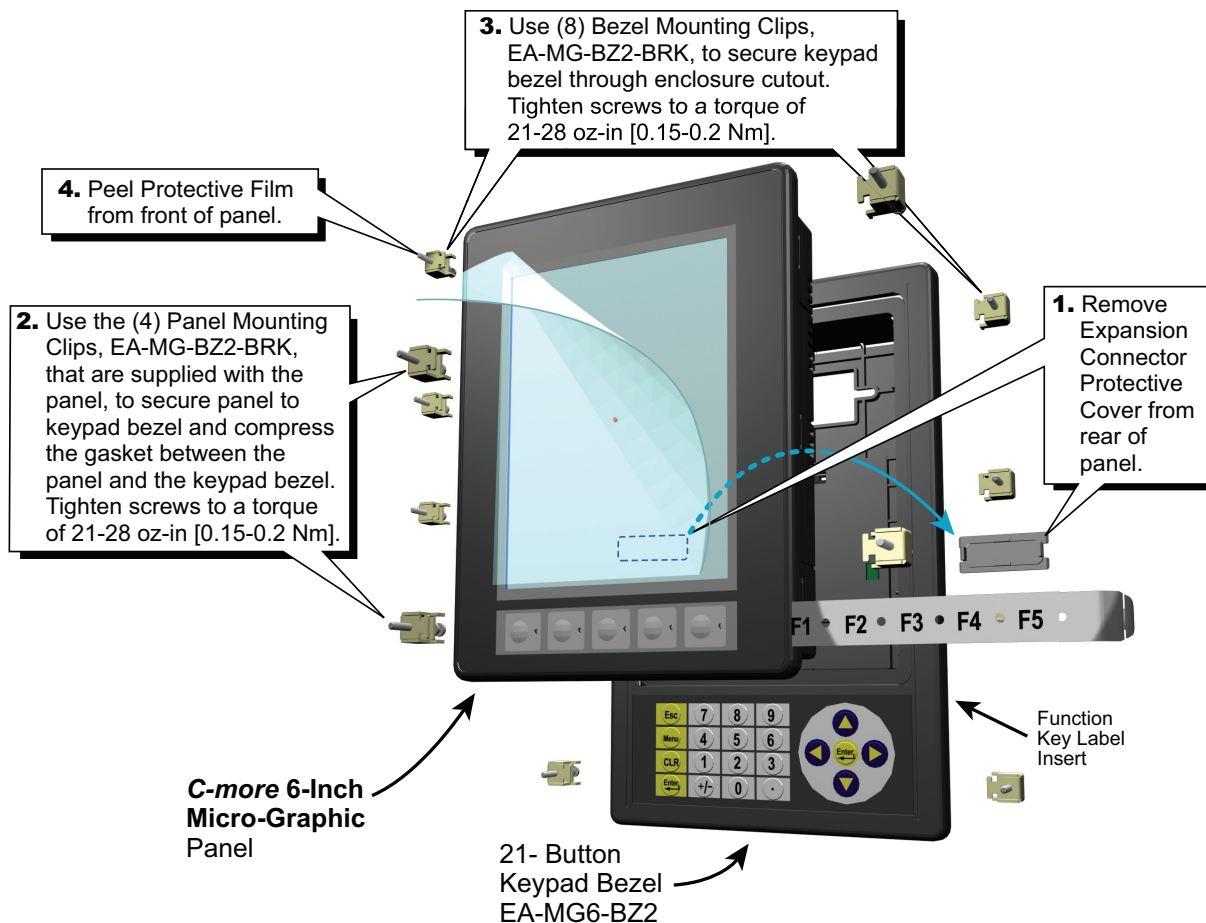
**C-more 6" Micro Graphic Panel  
installed in a 21 button Keypad  
bezel EA-MG6-BZ2P**



21-Button Keypad Bezel continued at top of next page.

## 21-Button Vertical (Portrait) Keypad Bezel (cont'd)

### Panel and 21-Button Keypad Bezel Assembly

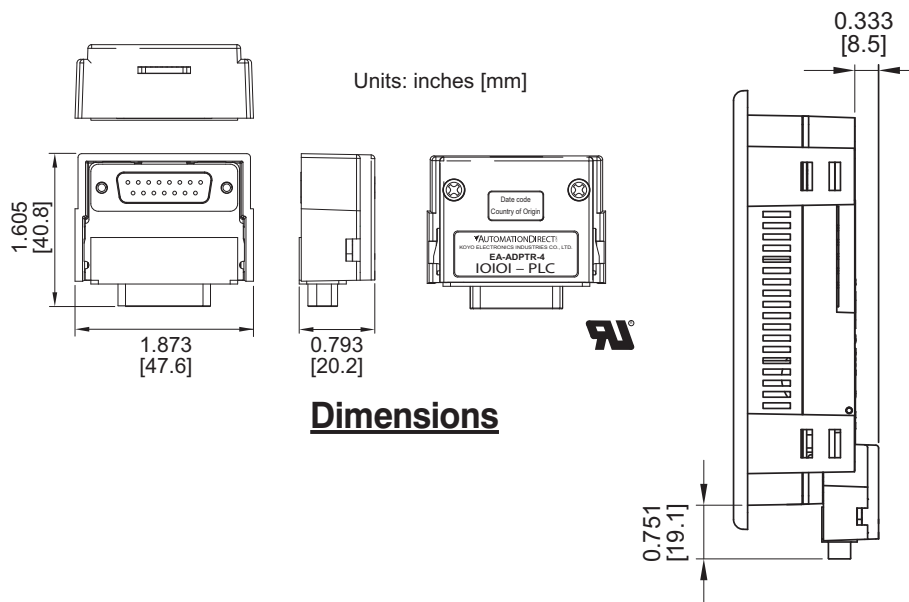


**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

## D-SUB 15-pin 90-degree Communication Port Adapter

The EA-ADPTR-4 adapter plugs into the 15-pin serial port on the rear of the panel to allow a PLC communication cable to be plugged in at a 90 degree angle to reduce panel depth requirements. 15-pin straight through pin-out. UL Recognized.

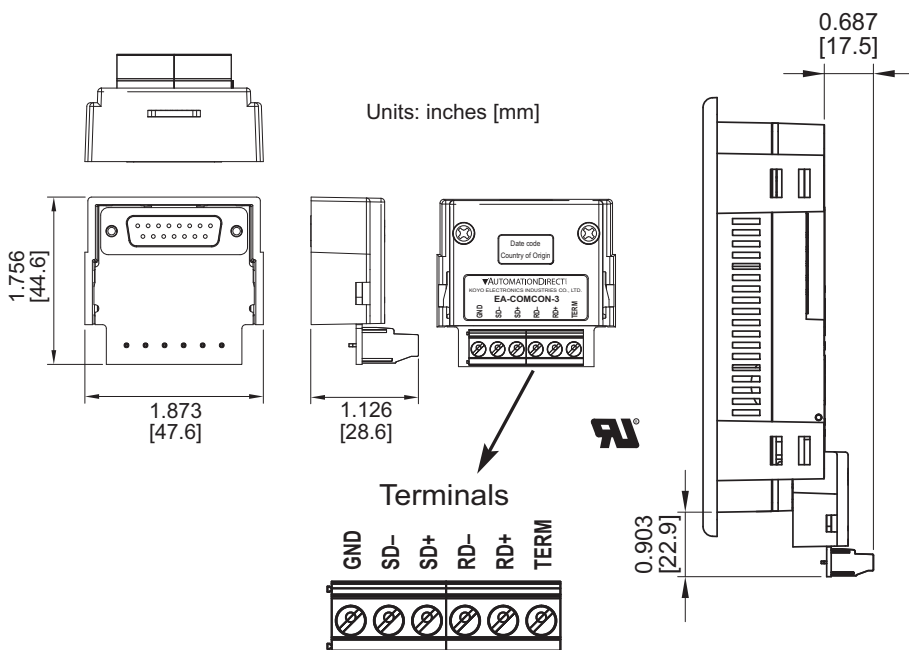
### EA-ADPTR-4



### Dimensions

## D-SUB 15-pin to Terminal Block Adapter

The EA-COMCON-3 adapter plugs into the 15-pin serial port on the rear of the panel to allow wire terminal connections for an RS-422/RS-485/DH-485 PLC communication cable. UL Recognized.

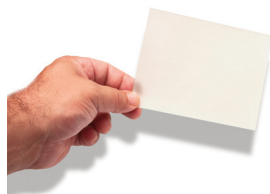




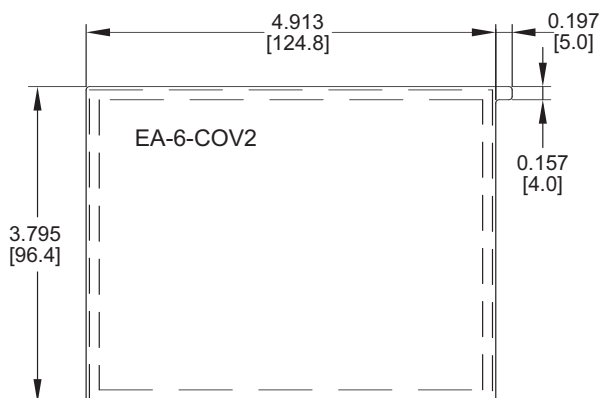
## Clear Screen Overlay

Optional clear screen overlay used to protect *C-more* Micro-Graphic displays from minor scratches and wear. Package contains three clear screen overlays.

### EA-6-COV2



### Dimensions



### Clear Screen Overlay Installation

#### Step 1



Remove the overlay from the package

#### Step 2



Remove the paper backing from the overlay

#### Step 3



Align the overlay with the screen and press the adhesive firmly into place

#### Step 4



Remove the protective film\*



**\*NOTE:** The protective cover ships with a thin protective sheet on the face of the cover that needs to be carefully removed. If your panel is not clear, the protective sheet may not have been removed.





# INSTALLATION & WIRING

---



## In This Chapter...

Safety Guidelines .....	4-2
Introduction .....	4-3
Panel Cutout Dimensions (all models) .....	4-4
Wiring Guidelines .....	4-5

# 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 Web site: <http://www.automationdirect.com>

## 4



**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 *C-more* 6" Micro-Graphic panels require selecting an appropriate location for the panel, laying out the cutout dimensions on the surface of the control cabinet that the panel will be mounted through, securing the panel with the provided mounting clips, tightening the screws to the appropriate torque rating to assure the gasket is sealing correctly, and finally connecting the appropriate power source to the panel.

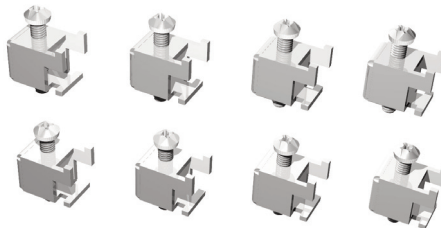


**NOTE:** Each *C-more* 6" Micro-Graphic panel is provided with a cutout template to simplify marking the proper cutout size on the surface of the control cabinet that the panel will be mounted through. The keypad bezels are also provided with an appropriate cutout template for mounting convenience.

The *C-more* 6" Micro-Graphic panels include four mounting clips. They are fitted to the panel by inserting two tabs into mating slots on the panel and then sliding the clip into a narrower slot to secure it in place.

If using the panel with a Keypad Bezel, then install the panel into the keypad bezel and secure with the mounting clips that are provided with the panel to seal the panel gasket. Create a cutout in the enclosure that the assembled panel and keypad bezel will be mounted through and secure the assembly with the mounting clips that are provided with the keypad bezel. See **Chapter 3: Accessories** for additional details.

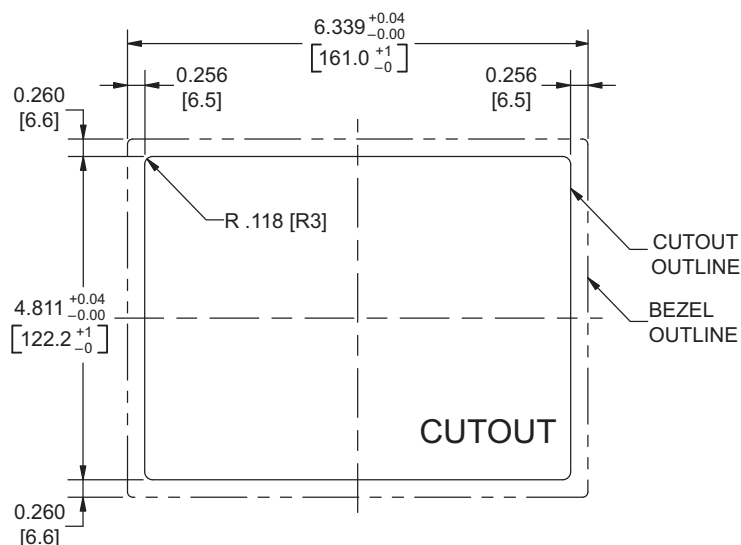
### Mounting Clips EA-MG-BZ2-BRK



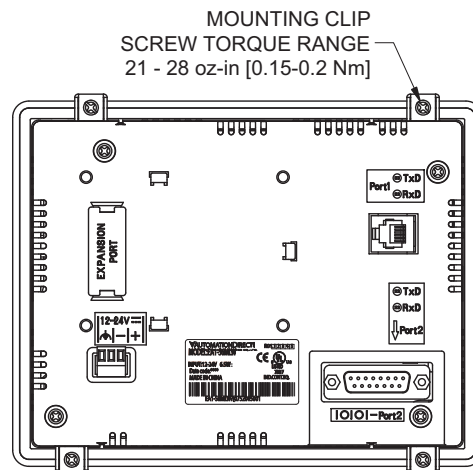
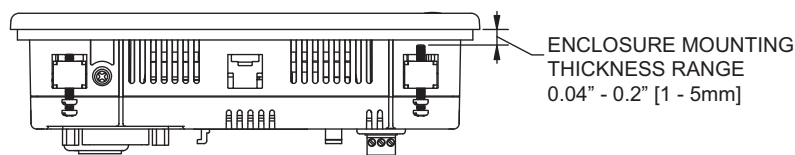
**NOTE:** The *C-more* 6" Micro-Graphic panel (EA1-S6ML & EA1-S6MLW), 20-Button Keypad Bezel (EA-MG6-BZ2) and 21-Button Keypad Bezel (EA-MG6-BZ2P) use the same type of mounting clip (EA-MG-BZ2-BRK).

## Panel Cutout Dimensions (all models)

The *C-more* 6" Micro-Graphic panel is mounted into a cutout through the control cabinet and secured with four (4) mounting clips. The mounting clips are provided with the panel. There are slots on each side of the panel's long dimension that the two tabs on each mounting clip will match. The mounting clips are held in place by inserting the tabs into the "T" shaped holes (slots) and then moving the mounting clip toward the rear of the panel to keep it in place. Next tighten the mounting clip screws to pull the rear of the panel's bezel to the control cabinet's mounting surface. The screws need to be tightened to the torque rating shown in the illustration below so that the gasket is compressed to form the proper seal between the panel and cabinet surface.



## Enclosure Mounting Thickness Ranges and Mounting Bracket Screw Torque



## 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 us at 1-800-633-0405 or 770-844-4200.

This publication is based on information that was available at the time it was printed. At AutomationDirect.com® we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without obligation. This publication may also discuss features that may not be available in certain revisions of the product.

### Providing Power to the *C-more* Micro-Graphic Panel

Power can be supplied to the *C-more* Micro-Graphic panel in one of three different ways.

- 1.) The *C-more* Micro-Graphic panel is powered during programming from the PC through the USB to RS-232 Programming Cable Assembly, EA-MG-PGM-CBL. The panel will operate in Low-Power mode when powered by the PC and result in a dim screen.
- 2.) During operation, the panel functions in High-Power Mode when supplied powered by a minimum 1 Amp 12 - 24 VDC power source. Recommended power supplies are AutomationDirect part number PSP24-024S or PSP24-024C.
- 3.) During operation, the *C-more* Micro-Graphic panel can function in Low-Power Mode powered from most *AutomationDirect* PLC's RJ12 serial communications port. Use a DV-1000CBL communications cable, or a DV-1000CBL communications cable with a FA-15HD 15-pin HD DSub/RJ12 Adapter connected to most AutomationDirect PLC's 15-pin HD communications port (DL06, D2-250-1 & D2-260) PLCs for Low-Power operation. See **Chapter 6: PLC Communications** for additional details. The panel will operate in low-power mode when powered by the PC.

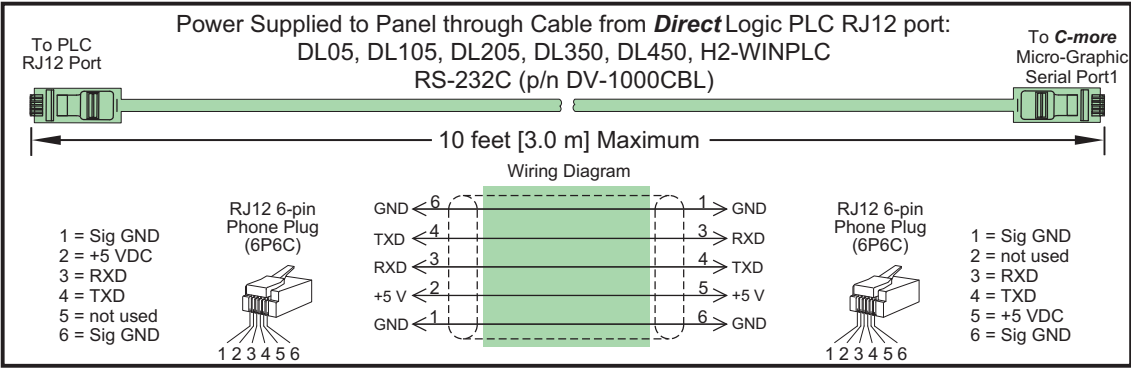


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

Wiring Guidelines continued at top of the next page.

Wiring Guidelines (cont'd)

Panel Powered from AutomationDirect PLC via Communications Cable

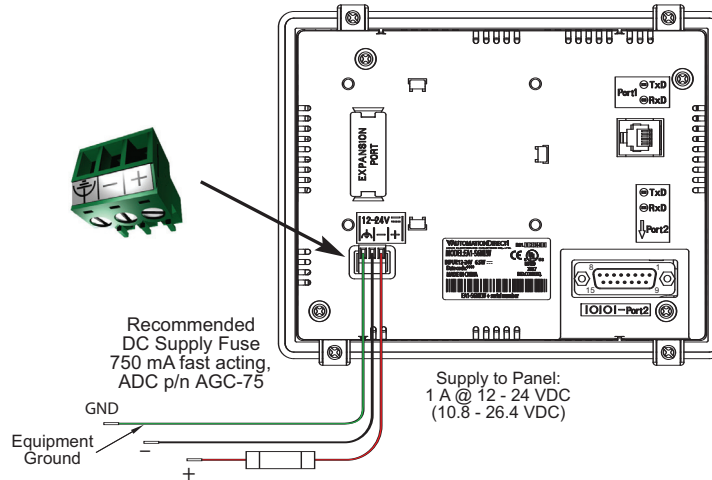


**NOTE:** Maximum cable length when the panel is powered via a PLC is 10 feet.

Wiring Guidelines continued at top of the next page.

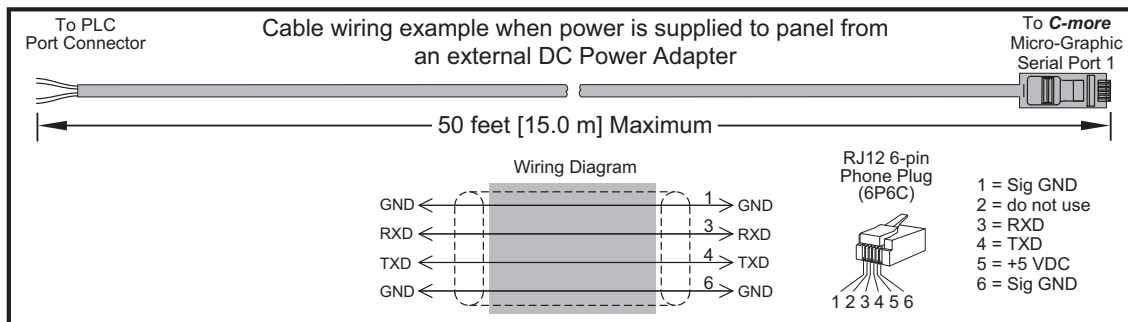
## Wiring Guidelines (cont'd)

### Panel Powered from an external DC Power Supply – Wiring Diagrams



**NOTE:** Recommended DC power supply, **AutomationDirect** Part No. PSP24-024S or PSP24-024C.

### Maximum communication cable length when powered from an external DC Power Adapter



**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.





# SYSTEM SETUP SCREENS

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# CHAPTER 5

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# Introduction

The *C-more*<sup>®</sup> Micro-Graphic panels include a series of built-in **System Setup Screens** that allow the user to view detailed information about the panel, adjust features, test various functions of the panel, clear memory, and reset all values and conditions back to the original factory defaults.

The following is presented to give the user a detailed step by step look at:

- How to access the System Setup Screens
- What adjustments and features are available
- When and why the feature may need to be adjusted or used
- How to adjust and/or interrupt the features

The System Setup Screens are split into three categories to make it easy for the user to view information, make adjustments, or test the panel. The three Setup Menu selections are:

## Information

Here you will find detailed information about the panel's available memory and usage, the protocol being used by the panel, if an optional keypad bezel is installed and version information for the firmware and boot loader.

## Setting

This is the area for adjusting the contrast of the display, selecting one of the five backlight colors (red, amber, yellow, lime or green for EA1-S6ML or white, pink1, pink2, pink3 or red for EA1-S6MLW), enabling or disabling the internal beeper, calibrating the touch panel, clearing the user memory, resetting all of the settings back to the factory defaults, and setting the loading screen hourglass icon delay time or disabling the display of the hourglass icon.

The Setting factory default values are:

- LCD Contrast value of 8
- Green backlight color for EA1-S6ML, white backlight color for EA1-S6MLW
- The internal audible beeper enabled
- Forced touch panel calibration
- User program cleared from memory
- Hourglass icon delay of 350 ms.
- Horizontal orientation

## Test Menu

The test menu includes options to initiate communication tests of the two serial ports, to test communications with the PLC, to test operation of the panel's beeper and to test the touch panel surface. Refer to the serial port 1 and serial port 2 loop back test sections of this chapter for details on loop back connector wiring.

## Accessing the System Setup Screens

To access the Setup Menu of the panel System Setup Screens, press the panel's BAK [F1] and ENT [F5] function keys simultaneously for three (3) seconds as shown below. The System Setup Screens' Setup Menu will be displayed as shown at the bottom of this page.

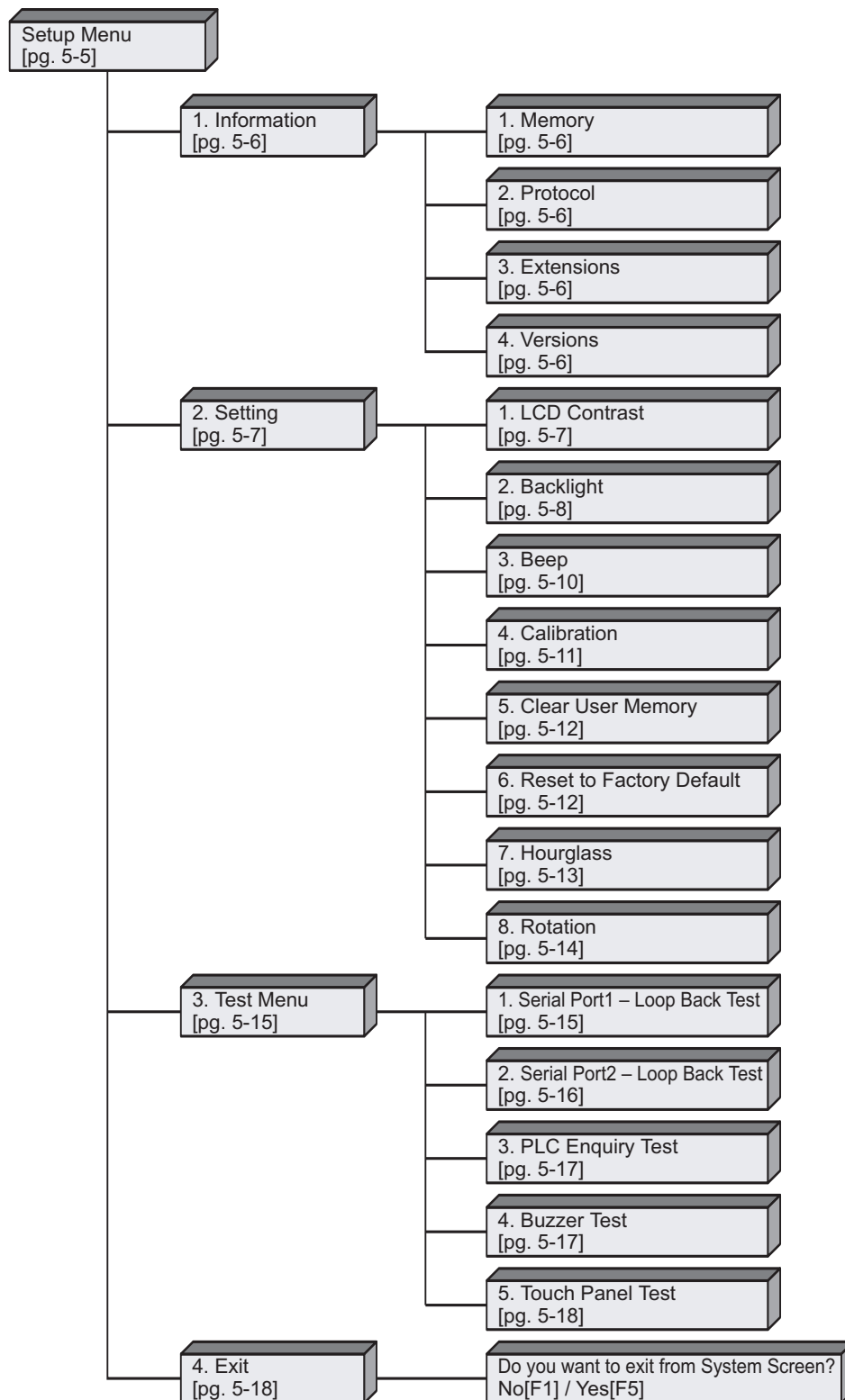
Press both the F1 and F5 function keys simultaneously for 3 seconds to bring up the System Setup Screens' Setup Menu.

### C-more 6" Micro-Graphic Panel

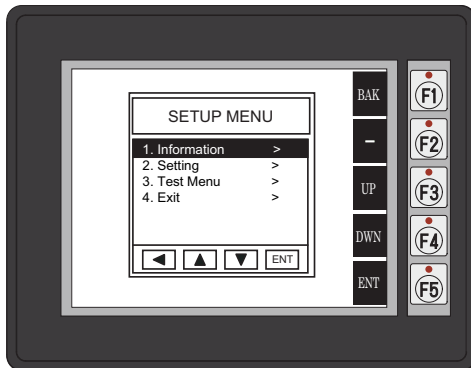
5



## System Setup Screens Flowchart

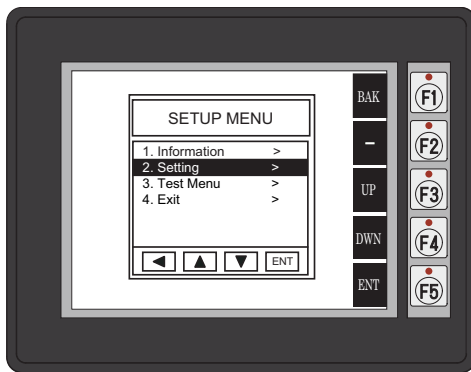


## Setup Menu

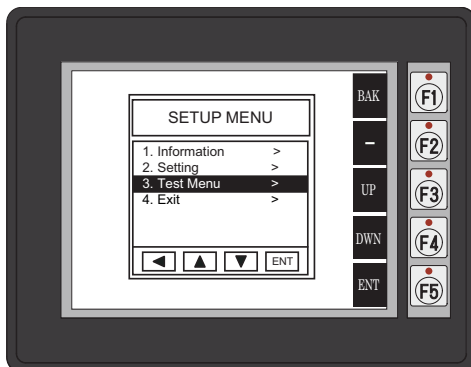


To navigate the different selections under the Setup Menu, use the function keys BAK [F1] to return to the project screen or previous screen, UP [F3] to cursor up, DWN [F4] to cursor down, and ENT [F5] to enter a selection.

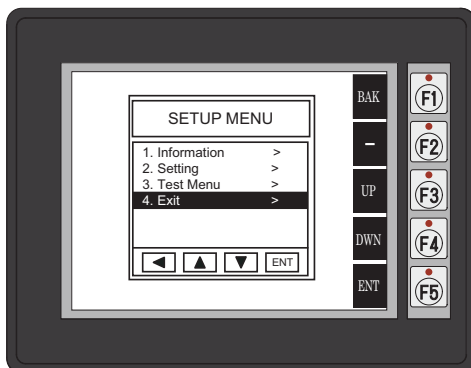
Pressing ENT [F5] with **Information** highlighted will take you to the **Information** menu screen. See page 5-6.



Pressing ENT [F5] with **Setting** highlighted will take you to the **Setting** menu screen. See page 5-7.

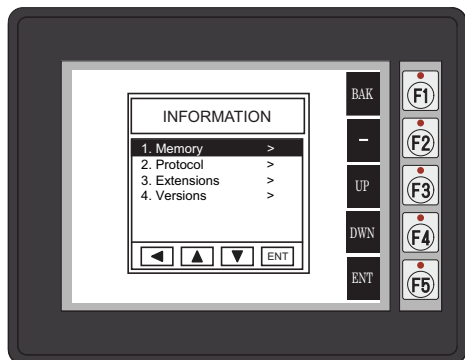


Pressing ENT [F5] with **Test Menu** highlighted will take you to the **Test Menu** screen. See page 5-15.

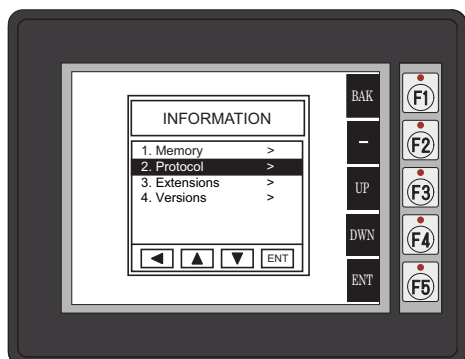
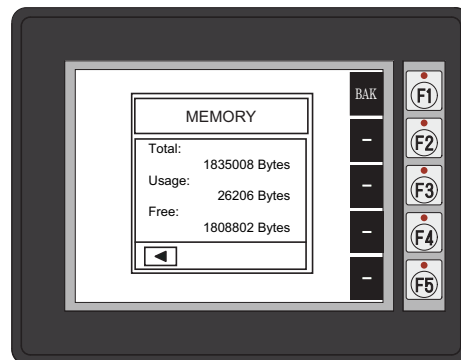


Pressing ENT [F5] with **Exit** highlighted will allow the user to decide whether to **Exit** or not **Exit** the System Setup Screens. See page 5-18.

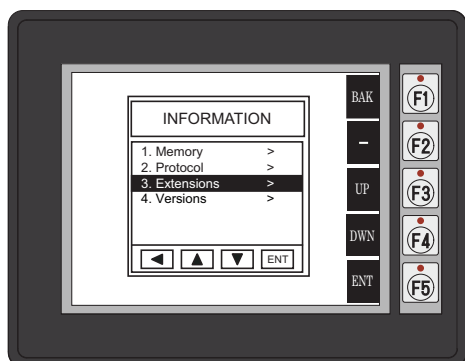
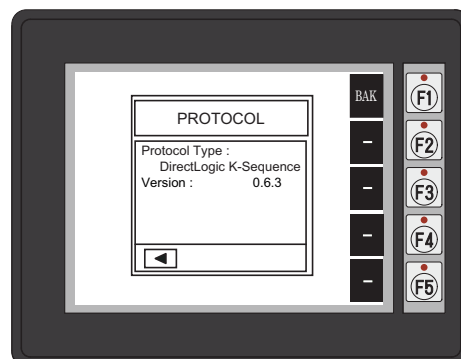
## Information Menu



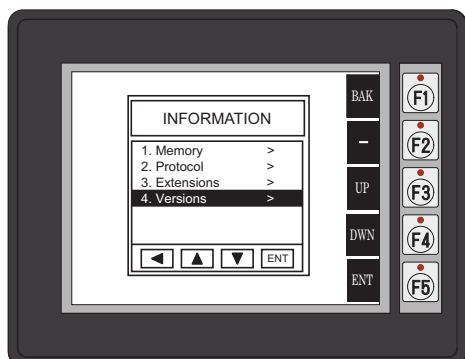
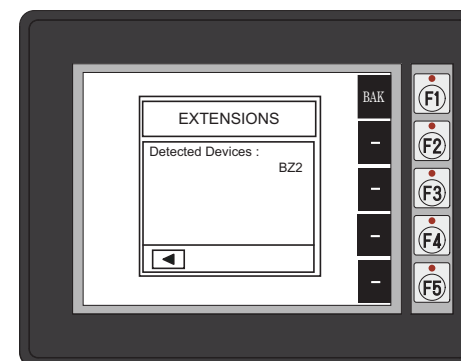
Pressing ENT [F5] with **Memory** highlighted will show the total memory available, memory usage and free memory available for the project.



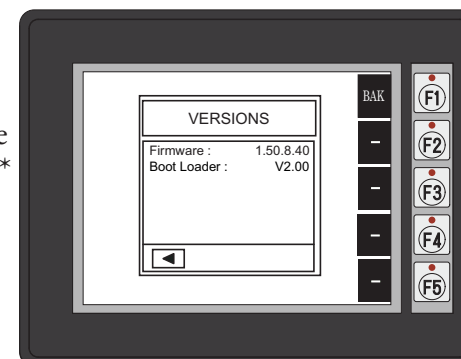
Pressing ENT [F5] with **Protocol** highlighted will show the PLC Protocol that has been assigned to the panel and the protocol version.



Pressing ENT [F5] with **Extensions** highlighted will show if an optional keypad bezel is installed on the panel. The example here shows the EA-MG6-BZ2.

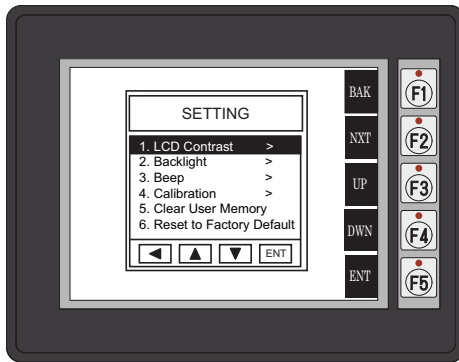


Pressing ENT [F5] with **Versions** highlighted will show the panel's firmware and boot loader versions.\*



**\*Note:** Firware Version 2.0 or later is required with models EA1-S6ML and EA1-S6MLW. Available for free download at [www.automationdirect.com](http://www.automationdirect.com)

## Setting Menu



Use the UP [F3] and DWN [F4] function keys to scroll through the list of settings. There are six selections on the first screen and two additional selections on a second screen. You can also use the NXT [F2] function key to go back and forth between the two screens without having to use the up and down keys. The BAK [F1] function key will return you to the previous screen. Use the ENT [F5] function key to make your selection once you have the setting highlighted.

The **Setting** screen includes the following:

**LCD Contrast** - page 5-7

**Backlight** – page 5-8 to 5-9

**Beep** – page 5-10

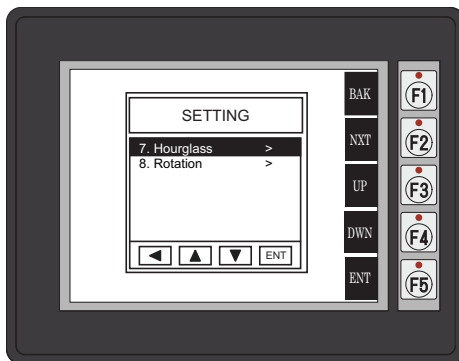
**Calibration** – page 5-11

**Clear User Memory** – page 5-12

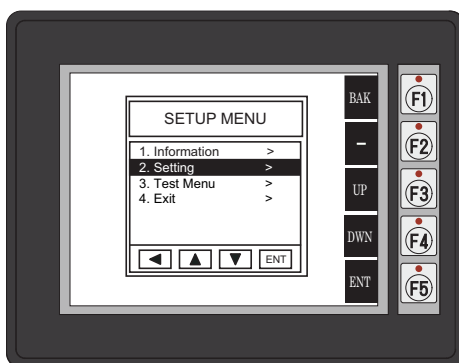
**Reset to Factory Default** – page 5-12

**Hourglass** – page 5-13

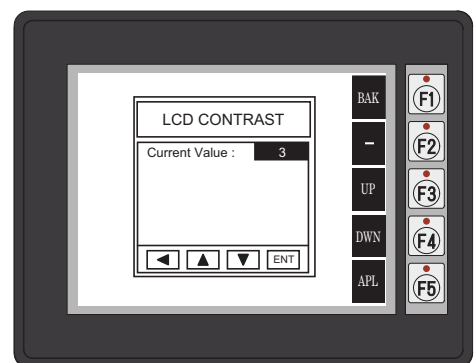
**Rotation** – page 5-14



## Setting – LCD Contrast



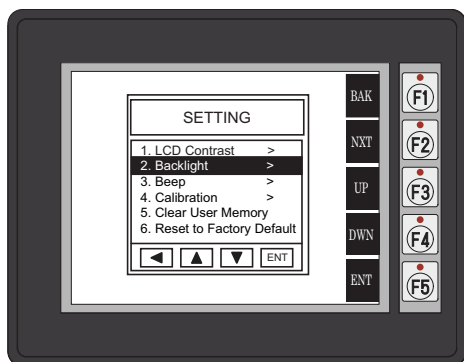
With **LCD Contrast** highlighted, press ENT [F5] to bring up the screen showing the current value. The default is 8. The contrast can be adjusted between 1 and 16, with 1 being the least contrast and 16 being the greatest.



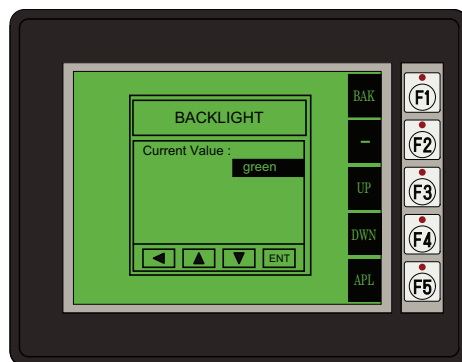
**Note:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.



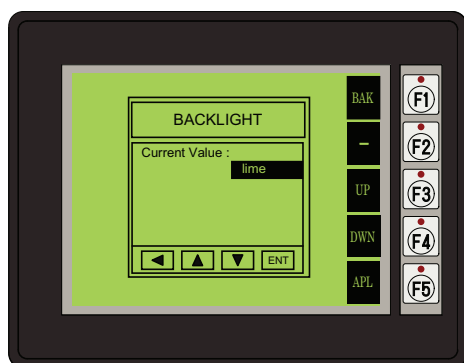
## Setting – Backlight, Model EA1-S6ML



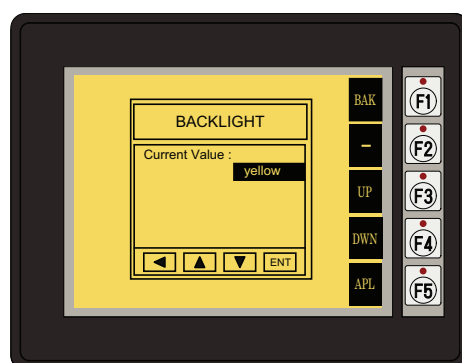
With Backlight highlighted, press ENT [F5] to show the current backlight screen color. For model EA1-S6ML, the default is green. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (green, lime, yellow, amber and red). Use the APL [F5] function key to apply the new color. Shown here are the various backlight colors.



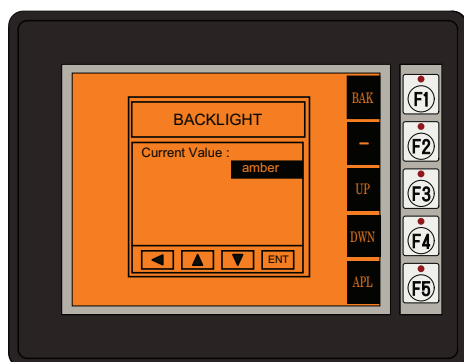
Green



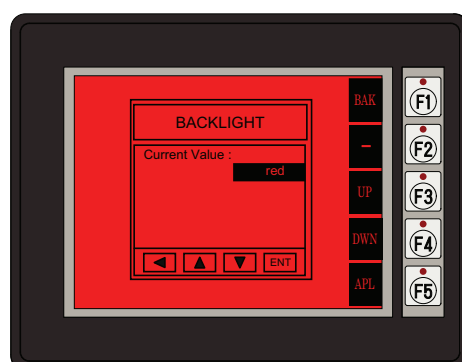
Lime



Yellow



Amber

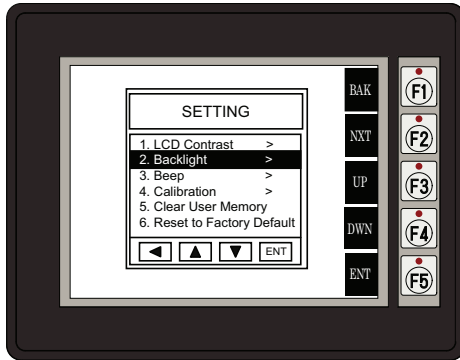


Red

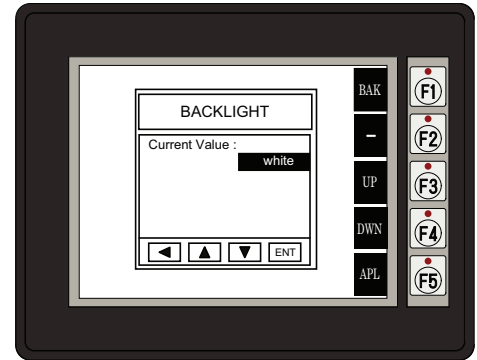


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

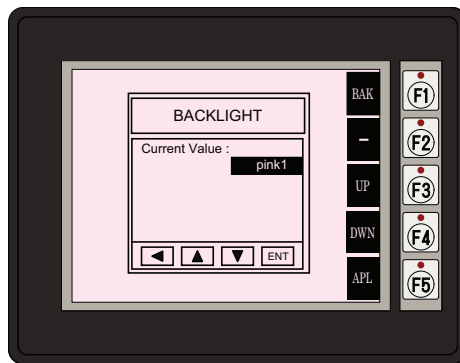
## Setting – Backlight, Model EA1-S6MLW



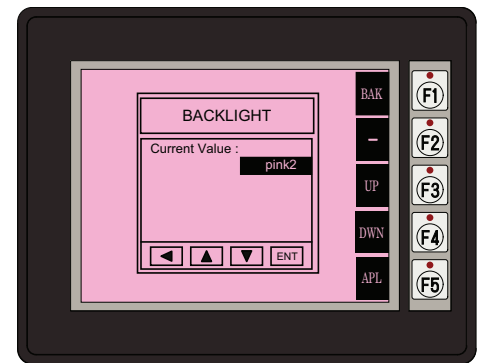
With Backlight highlighted, press ENT [F5] to show the current backlight screen color. For model EA1-S6MLW, the default is white. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (white, pink1, pink2, pink3 and red). Use the APL [F5] function key to apply the new color. Shown here are the various backlight colors.



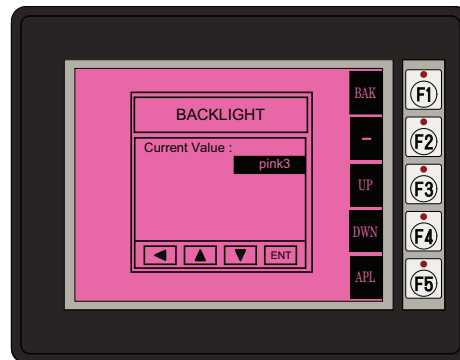
White



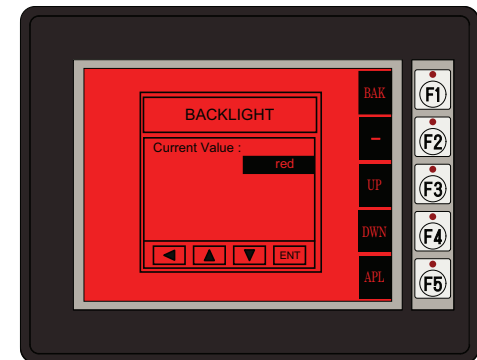
Pink1



Pink2



Pink3

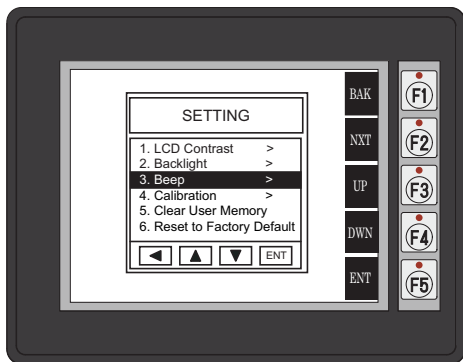


Red

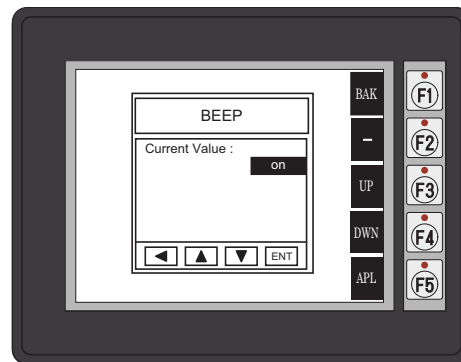


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

### Setting – Beep



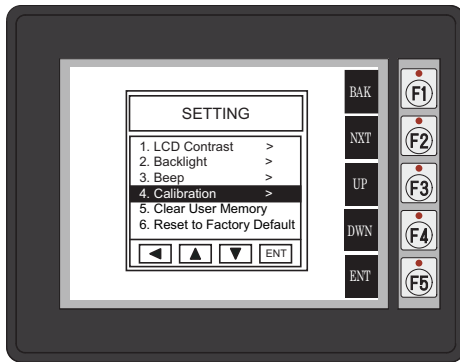
With **Beep** highlighted, press ENT [F5] to show the current value for the internal beeper. The default is **ON**. The UP [F3] and DWN [F4] function keys can be used to toggle between the ON and OFF state for the beeper (enable or disable). Use the APL [F5] function key to apply the selection.



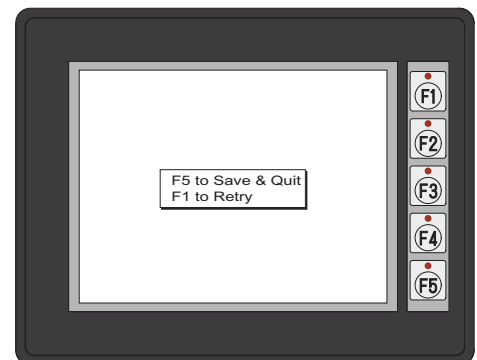
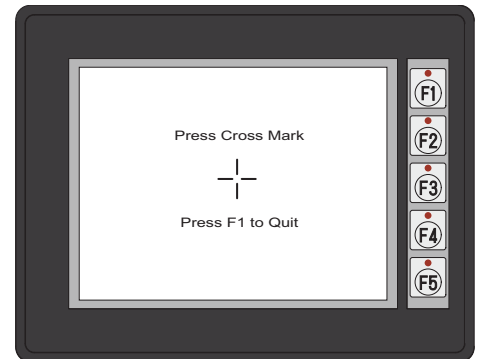
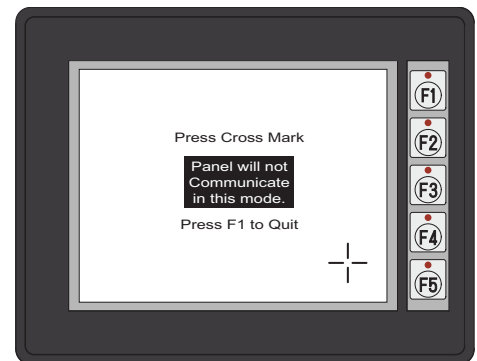
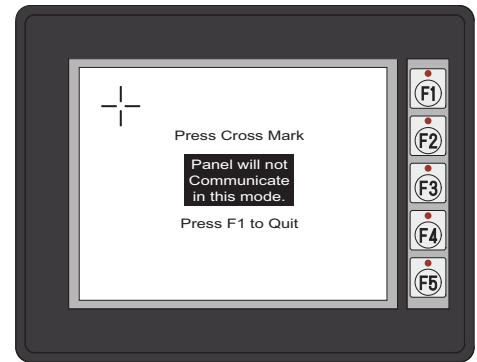
**Note:** Loading a project to the panel will override whatever selection is chosen for the beeper from the System Setup Screens' Beep on/off selection screen. The Beep on/off choice can be changed through the System Setup Screens **after** a project is loaded.

**Note:** When the panel is powered through Port1 from a connected PLC or PC, the beep will not function properly because the panel is running in **Low-power mode**. To use the beep signal, power the panel from an external 12-24 VDC power source.

## Setting – Calibration

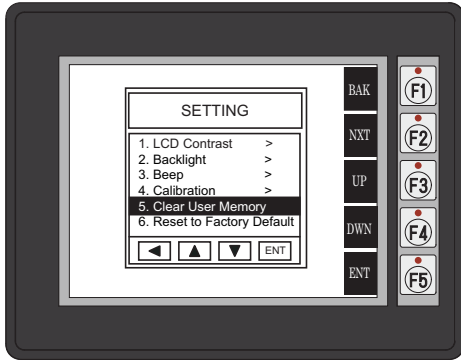


With Calibration highlighted, press ENT [F5] to bring up the first calibration screen as shown on the right. Touch the “cross” in the upper left corner as accurately as you can. When the screen is touched, the cross will move to each corner and finally to the center of the screen. If the touch points are within the built-in calibration tolerance, the final screen will allow you to either save and quit from the calibration procedure, or allow you to retry. If the points that were touched are not within the calibration tolerance, you will be returned to the first calibration screen and will need to start over.

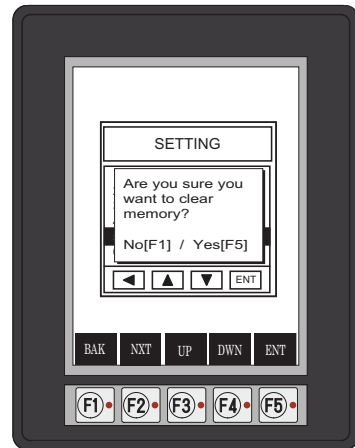
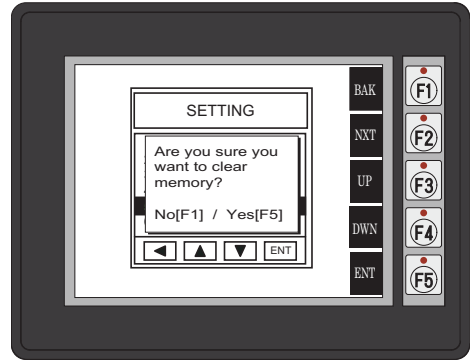


5

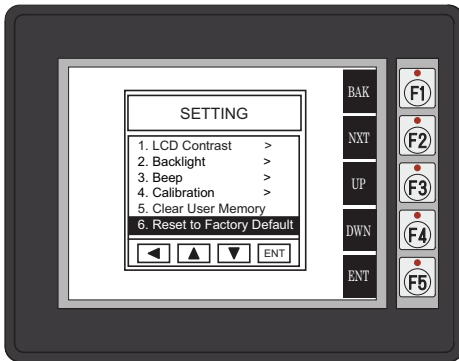
## Setting – Clear User Memory



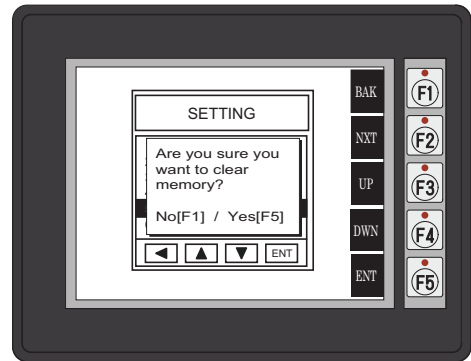
With Clear User Memory highlighted, press ENT [F5]. You will be given the choice to either proceed with clearing the user memory by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO.



## Setting – Reset to Factory Default



With Reset to Factory Default highlighted, press ENT [F5]. Press [F5] to restore all settings to factory defaults and clear user memory. Press [F1] to cancel.



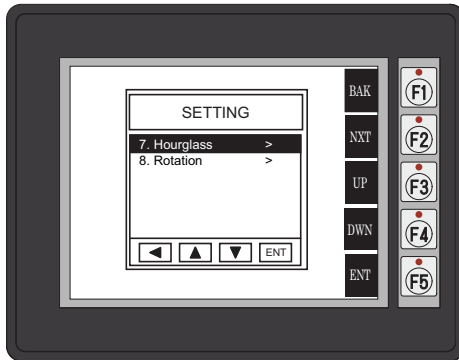
The Factory Default values are:

- LCD Contrast value of 8
- Green backlight color for EA1-S6ML, white backlight color for EA1-S6MLW
- The internal audible beeper enabled
- Forced touch panel calibration
- User program cleared from memory
- Hourglass icon delay of 350 ms.
- Horizontal orientation



**NOTE:** User memory is cleared when factory defaults are reset. Use the C-more Micro-Graphic programming software to read the program from the panel and save a backup copy.

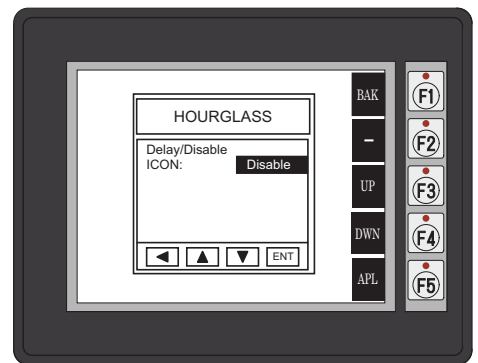
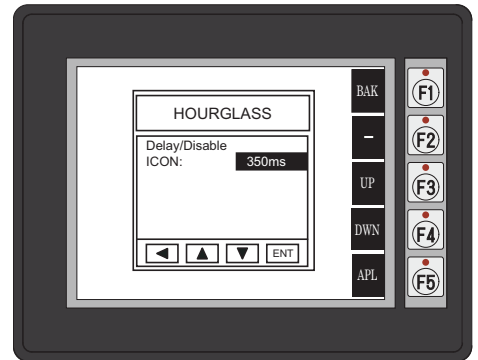
## Setting – Hourglass



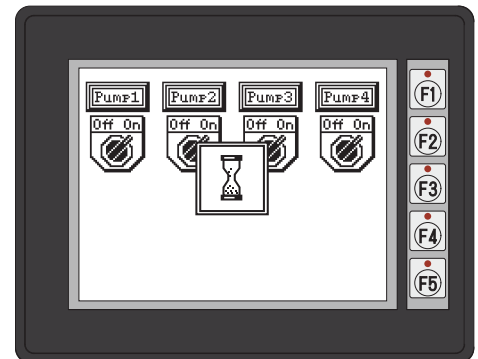
The **Hourglass** selection listed under the **Setting** menu can be used to either disable the display of the hourglass icon or set the amount of delay time (0 ms to 1000 ms) desired before it is displayed.

With **Hourglass** highlighted, press ENT [F5]. The UP [F3] and DWN [F4] function keys scroll through the selections. Use the APL [F5] function key to apply the selection.

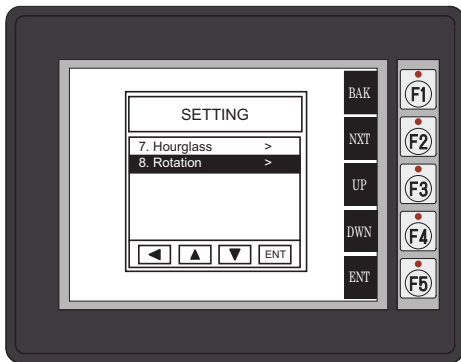
**Explanation:** An hourglass icon is displayed on the panel anytime a new screen is being loaded until communication is established with the new screen. If communication is established before the delay has timed out, no hourglass will be displayed. The hourglass icon can also be disabled from being displayed.



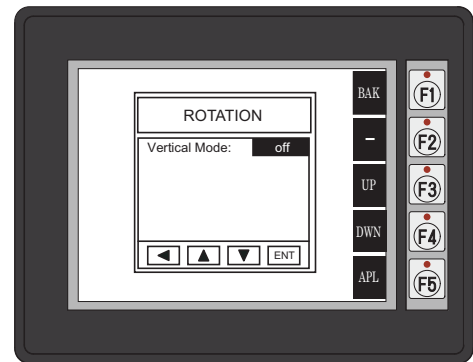
### Hourglass Icon



## Setting – Rotation

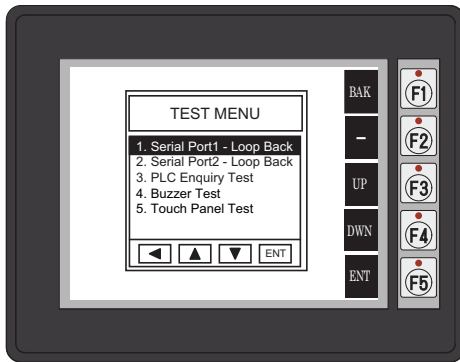


With **Rotation** highlighted, press ENT [F5] to show the current orientation. Press UP [F3] and DWN [F4] to toggle between the portrait (vertical) and landscape (horizontal) orientation. Use the APL [F5] function button to apply the selection.



**Note:** Loading a project to the panel will override the orientation chosen from the System Setup Screens' Rotation selection screen. The selected orientation is displayed only when in the System Setup Screens.

## Test Menu



Use the UP [F3] and DWN [F4] function keys to scroll through the list of tests. The BAK [F1] function key will return you to the previous screen. Use the ENT [F5] function key to make your selection once you have the test highlighted.

The Test Menu screen includes the following:

Serial Port1 - Loop Back Test – page 5-15

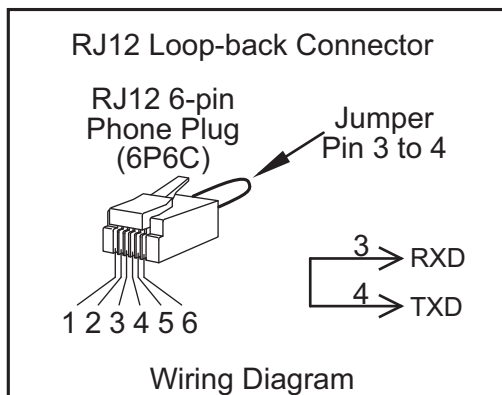
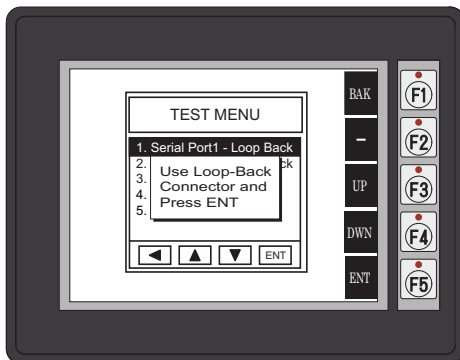
Serial Port2 - Loop Back Test – page 5-16

PLC Enquiry Test – page 5-17

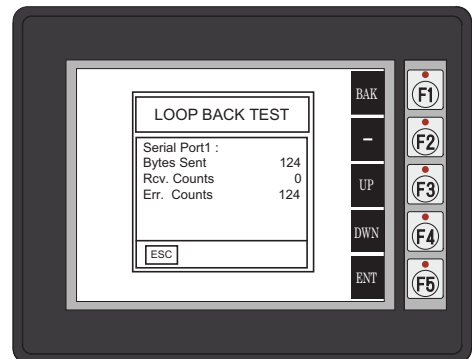
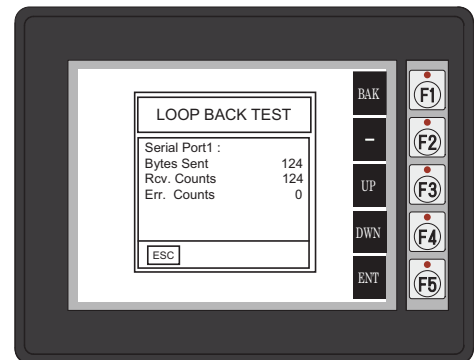
Buzzer Test – page 5-17

Touch Panel Test – page 5-18

## Test Menu – Serial Port1 - Loop Back Test



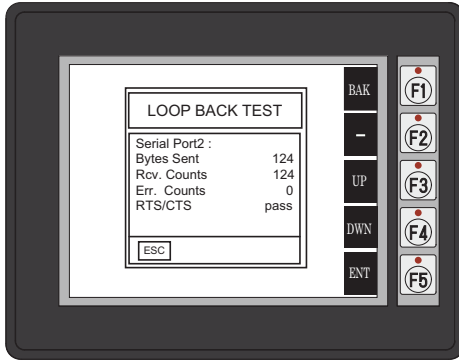
With Serial Port1 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the left. Connect a loop back connector constructed as shown here and press ENT [F5] to start the test. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not working, then the **Error Counts** will equal the **Bytes Sent**. The test will continue until the BAK [F1] key is pressed.



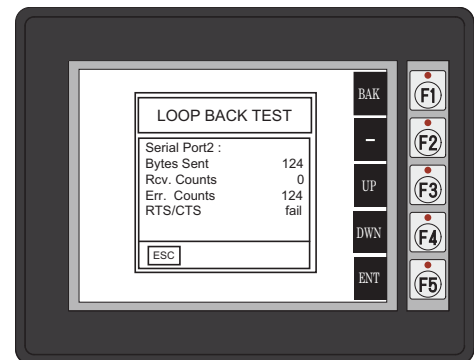
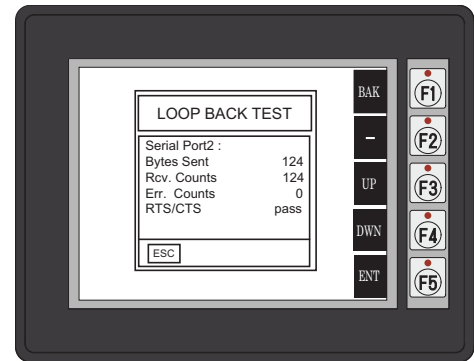
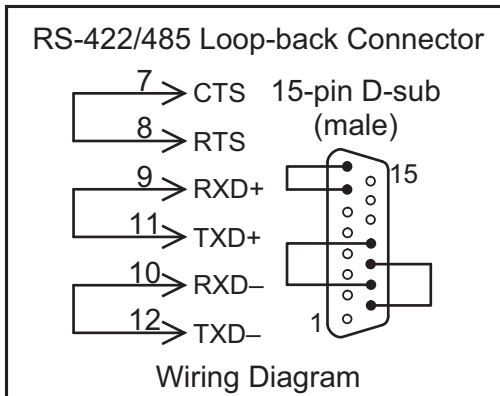
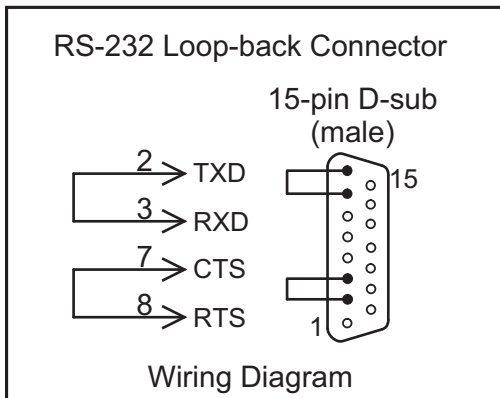
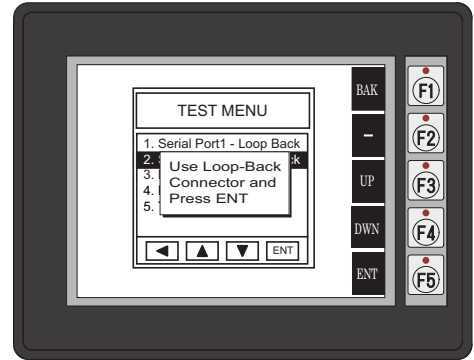


## Test Menu – Serial Port2 - Loop Back Test

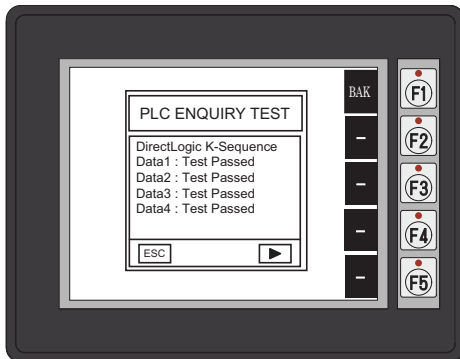
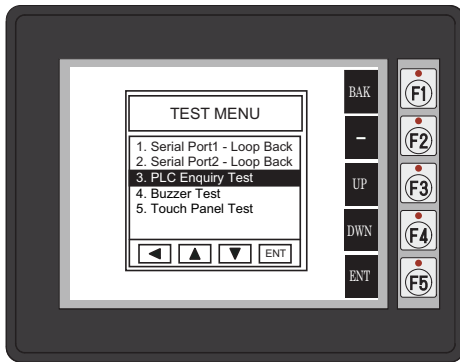
5



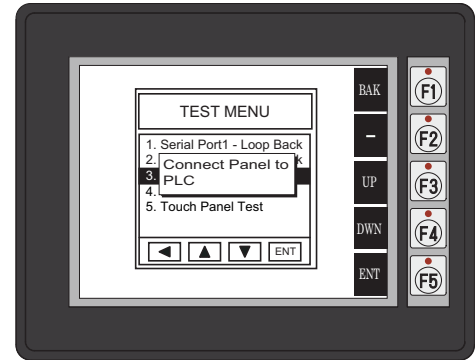
With Serial Port2 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the right. At this point, either connect the RS-232 loop back connector or the RS-422/485 loop backconnector, depending on which type of communications connection is being used, and press ENT [F5] to start the test. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not working, then the **Error Counts** will equal the **Bytes Sent**. The **RTS/CTS** signals will also show either **pass** or **fail** as shown to the right. The test will continue until the BAK [F1] key is pressed.



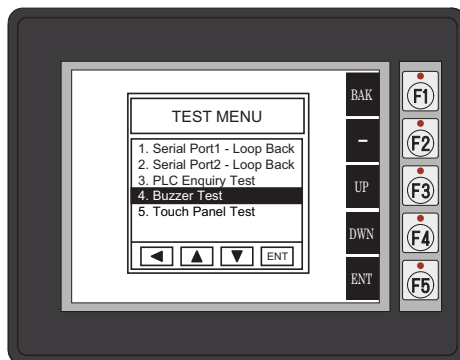
## Test Menu – PLC Enquiry Test



With **PLC Enquiry Test** highlighted, press ENT [F5] to bring up the screen shown to the right. If the PLC is connected to the panel, press ENT [F5] to start the test. Four data tests will be performed and indicated as either **Test Passed** or **Test Failed** as shown on this page. The BAK [F1] key can be pressed to cancel the test and/or returned to the previous screen.



## Test Menu – Buzzer Test



With **Buzzer Test** selection highlighted, press ENT [F5] to run the test on the internal audible beeper. The beeper will sequence up the scale through eight notes and then start over. The BAK [F1] key can be pressed to cancel the test.

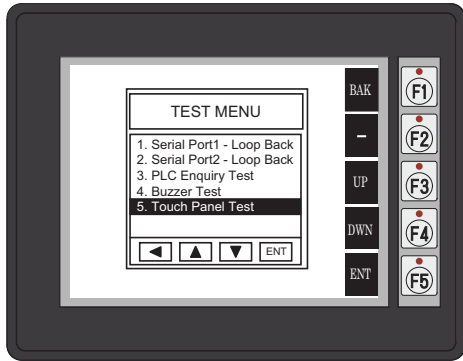


**Note:** The beeper tone is not selectable. The beeper function can not be turned on or off from this screen, refer to the Setting menu.



**Note:** When the panel is powered through Port1 from a connected PLC or PC, the beep will not function properly because the panel is running in **Low-Power Mode**. To use the beep signal, power the panel from an external 12-24 VDC power source.

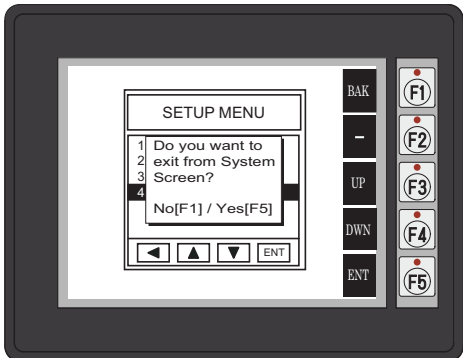
## Test Menu - Touch Panel Test



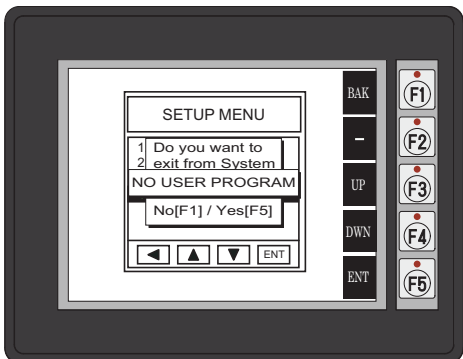
With Touch Panel Test highlighted, press ENT [F5] to bring up the screen shown to the right. Touch any area of the screen to visualize the active area of the touch screen. If the touch panel area is working properly, the screen will blacken at the area touched. Use this test to identify any area that is not responding properly. Press any key [F1 to F5] to return to the Test Menu.



### Exit



With Exit highlighted, press ENT [F5] to bring up the screen shown to the left. You will be given the choice to either proceed with exiting the **System Setup Screens** by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO. You will be returned to the project screen if answering YES.



If there is no user program loaded into the panel, then a **NO USER PROGRAM** message as shown to the left will be displayed.

# PLC COMMUNICATIONS

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<b>DirectLOGIC PLCs Password Protection</b> .....	<b>.6-6</b>
<b>PLC Compatibility and Connection Charts</b> .....	<b>.6-6</b>
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### Introduction

The *C-more*® 6" Micro-Graphic panels are capable of communicating with the entire *DirectLOGIC* family of PLCs. The panel is capable of communicating using RS232 on Port1 and RS232, RS422 or RS485 on Port2. When using Port1, a RJ12 serial port, the *C-more* 6" Micro-Graphic panel connects with the DL05, DL06, DL105, DL205, D3-350 and DL405 CPUs using the following cables.

- DV-1000CBL – connects to DL05, DL06, DL105, DL205, D3-350 and D4-450 phone jack: RJ12 - RJ12
- D4-1000CBL – connects to all DL405 CPU 15-pin ports. : RJ12 - 15-pin D-sub

The *C-more*® 6" Micro-Graphic panel can also communicate using RS232, RS422 or RS485 using the following cables.

- EA-2CBL - connects to DL05, DL105, DL205, DL350, DL450, H2-WINPLC phone jack: RJ12 - 15 pin D-sub.
- EA-2CBL-1 - connects to D2-250, D250-1, D2-260, DL06 VGA connector: 15-pin HD - 15 pin D-sub.

The panel also has the ability to communicate with Allen-Bradley PLCs that support the Allen-Bradley DF1 and DH485 protocols. Use Port2 with the following cables to connect the panel to a majority of Allen-Bradley PLCs.

- EA-MLOGIX-CBL – connects to AB MicroLogix 1000, 1100, 1200 & 1500: 15-pin D-sub - 8-pin DIN
- EA-SLC-232-CBL – connects to AB SLC 5/03, /04, /05, ControlLogix, CompactLogix, FlexLogix: 15-pin D-sub - 9-pin Dshell female
- EA-PLC5-232-CBL – connects to AB PLC5: 15-pin Dshell - 25-pin Dshell
- EA-DH485-CBL – connects to AB MicroLogix, SLC500, and any PLC using AB AIC device: 15-pin Dshell - RJ45 8-pin

The PLC Compatibility and Connection Chart tables on the following pages list all of the various PLCs and protocols that can be configured. Other third party PLCs include GE, Mitsubishi, Omron, Modicon and Siemens. The rest of this chapter shows the pin to pin connections of all the available cables plus wiring diagrams to construct cables.



**NOTE:** Refer to the PLC Compatability and Connection Charts beginning on page 6-8 for a complete listing of PLC connections for the *C-more* 6" Micro-Graphic panel.



**NOTE:** A maximum cable length of 10 feet between the *C-more* Micro-Graphic panel and the PLC is recommended when powering the panel from the PLC.



**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

## Introduction (cont'd)

### Available PLC Protocols

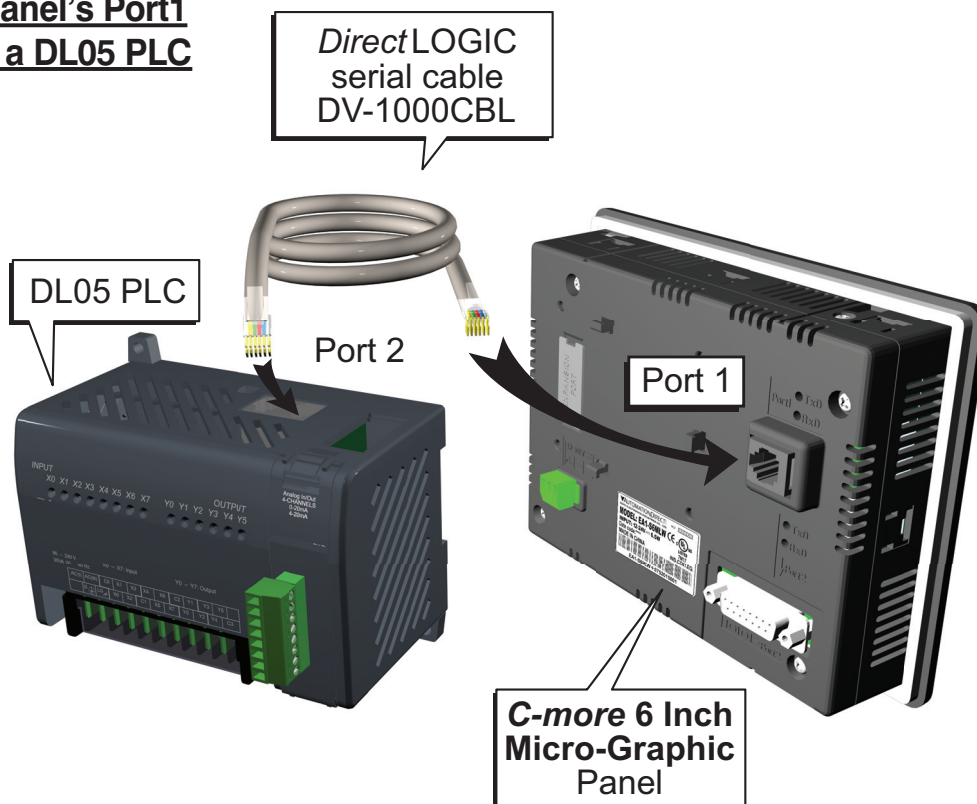
PLC Drivers	
<i>Serial - port1 or port2</i>	<i>Serial - port2 only</i>
DirectLOGIC K-sequence	Allen-Bradley DF1 Half Duplex
DirectNET	Allen-Bradley DF1 Full Duplex
Modbus (Koyo Addressing)	Allen-Bradley PLC5 DF1
Modbus RTU	Allen-Bradley DH485
Entivity Modbus RTU	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
	Mitsubishi FX
	Omron Host Link (C200 Adapter, C500)
	Omron FINS Serial (CJ1, CS1)
	Siemens PPI (S7-200 CPU)

The panel can also be connected to more than one PLC by using RS-422 or RS-485 wired in a multi-drop configuration. Port1 and Port2 cannot simultaneously communicate with multiple PLC's. See the example wiring diagrams at the end of this chapter for details.

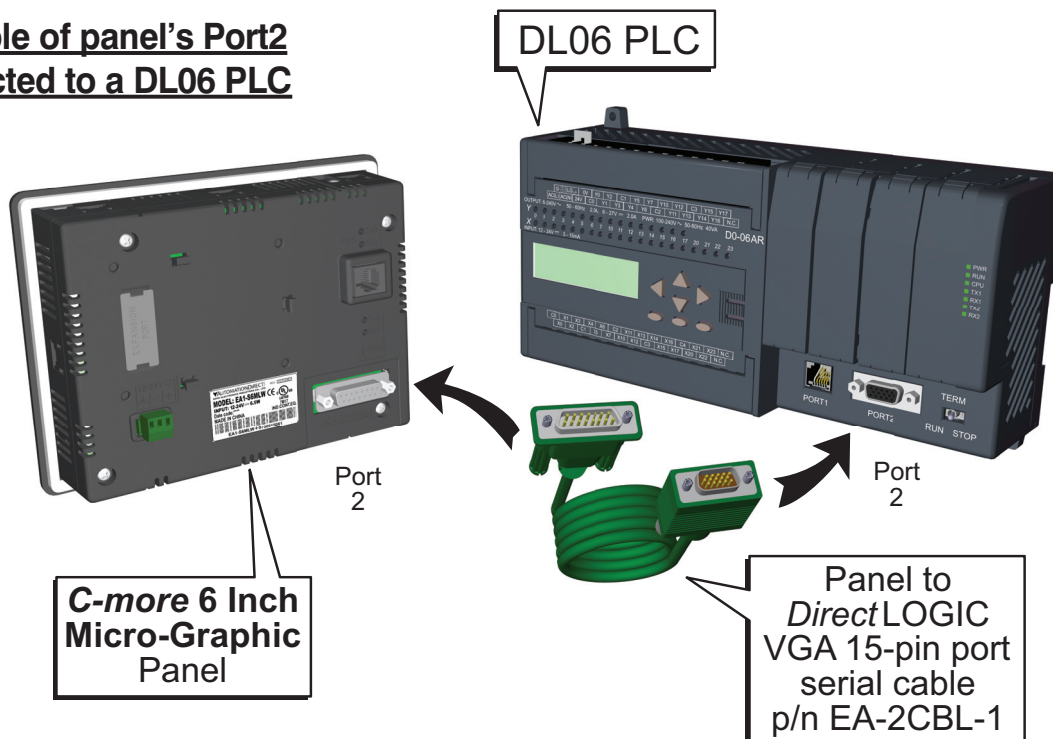
If you have difficulty determining whether the particular PLC and/or protocol you are using will work with *C-more* Micro-Graphic panels, please contact our technical support group at 770-844-4200.

## C-more 6" Micro-Graphic Communication Ports

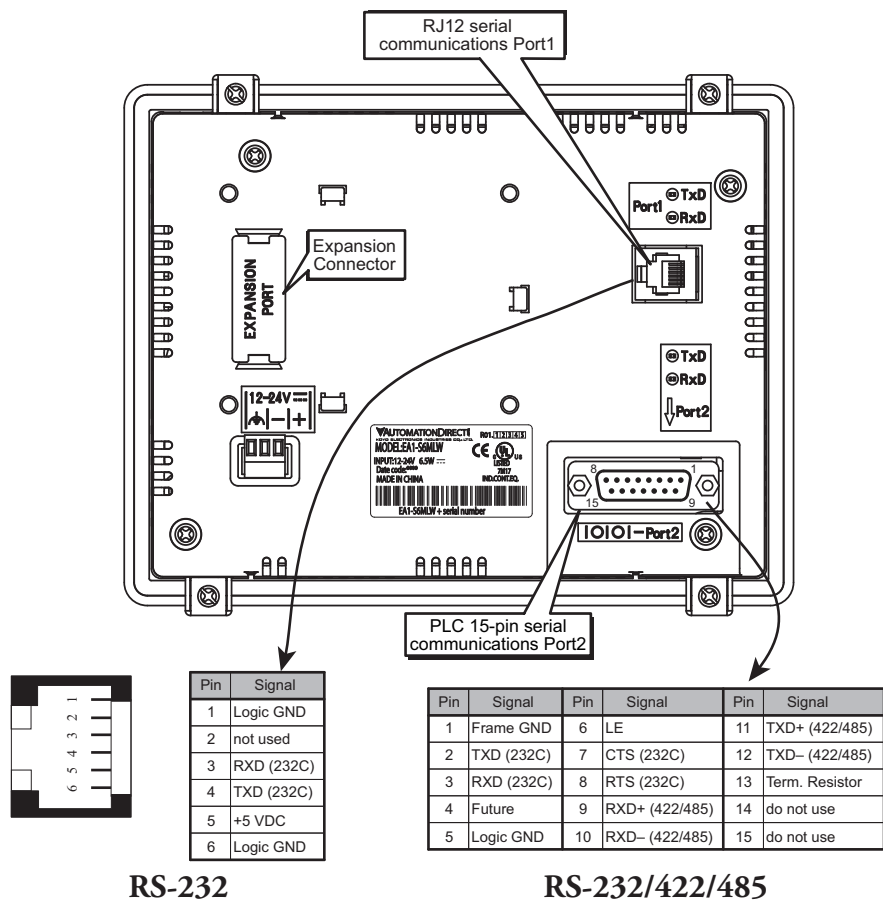
Example of panel's Port1 connected to a DL05 PLC



Example of panel's Port2 connected to a DL06 PLC



# C-more 6" Micro-Graphic Communication Ports (cont'd)



**NOTE:** Only one of the communication ports can be used with a connected PLC. The programming software allows the user to select either Port1 or Port2 under the Panel Manager dialog box. When using Port2 to communicate with the connected PLC, Port1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.



### DirectLOGIC PLCs Password Protection



**NOTE:** *DirectLOGIC 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 any variation of seven numeric characters (e.g. A1234567). Please refer to the specific PLC user manual for further details.*

### PLC Compatibility and Connection Charts

The following pages include charts that list the possible connections available between several brands of PLC's and the **C-more 6"** Micro-Graphic panel. AutomationDirect PLC's have the ability to communicate and provide low power to the panel using Port1 (RS-232). Port2 is a 15-pin D-sub communication port that supports RS-232, RS-485 and RS-422. An external 1 Amp @ 12-24 VDC external power source is required when using Port2.



**Note:** *Recommended DC power supply to power the **C-more** Micro-Graphic Panel, **AutomationDirect** Part No. PSP24-024S or PSP24-024C.*

The charts include the various PLC protocols that can be used with each combination of PLC port and panel port.

The charts list the recommended cables and/or manufactured devices that can be used to make up the communications link, and also refers to wiring diagrams that can be used to construct cables for connecting the PLC's port to the panel's port. The constructed cables are referred to as Diagram 1 through 13 and start on page 6-24.

Following the charts is a list of cables that can be purchased, including their wiring diagrams, and also wiring diagrams that are referenced from the charts that can be used to construct the referenced cables.

## PLC Compatibility and Connection Charts (cont'd)

### ***Direct* LOGIC PLCs RS-422A/RS-485A:**

When using the RS-422A/RS-485A communications capabilities of the *C-more* Micro-Graphic Serial Port (Port 2), the termination resistor is placed between the **RXD-** and **RXD+** terminals on the PLC side of the connection between the touch panel 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 (termination resistor) to pin 9 (**RXD+**) on the C-more 15-pin PLC communications port.

### **Allen-Bradley:**

As stated in this chapter's introduction, the panel also has the ability to communicate with Allen-Bradley PLCs that support the Allen-Bradley DF1 and DH485 protocols. The chart for the various Allen-Bradley PLCs includes recommended cables.

### **GE, Mitsubishi, Omron, Modicon and Siemens:**

Other 3rd party PLCs can be used with the *C-more* Micro-Graphic panel. These PLCs are listed in a chart and various wiring diagrams are shown to allow connectivity.

## How to use the PLC Compatibility and Connection Charts

- 1.) Find the PLC Family being used.
- 2.) Find the particular PLC model in the PLC family.
- 3.) Find the PLC communications port you will be connecting to the *C-more* Micro-Graphic panel.
- 4.) Read across the chart to determine if the *C-more* Micro-Graphic panel's Port1 and / or Port2 can be used and then determine the cable and other components, manufactured or user constructed, are required.

### Example:

6

PLC Compatibility & Connection Chart							
PLC			C-more Micro-Graphic Panel				
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.				
			3 **PLC Port Powered or External DC Power Supply		External DC Power Supply		
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female		
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type	
DirectLOGIC DL05	all versions	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL ** RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232	
		Port 2 RJ12 - 6 pin					
	DO-DCM	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL ** RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232	
		Port 2 DB15HD (female)		DV-1000CBL ** + FA-15HD RS-232		Modbus RTU	EA-2CBL-1 RS-232 * See Diagram 1 RS-422 * See Diagram 2 RS-485 Modbus only

**DirectLOGIC DL05, DL06, D0-DCM Module & DL105 PLCs****Panel Powered via external power supply, Port1 or Port2 Communications**

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			*PLC Port Powered or External DC Power Supply		External DC Power Supply	
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
<b>DirectLOGIC DL05</b>	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>DV-1000CBL *</b> RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>EA-2CBL</b> RS-232
		Port 2 RJ12 - 6 pin				
	D0-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>DV-1000CBL *</b> RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>EA-2CBL</b> RS-232
		Port 2 DB15HD (female)		<b>DV-1000CBL * + FA-15HD</b> RS-232		<b>EA-2CBL-1</b> RS-232 ** See Diagram 1 RS-422
<b>Direct LOGICDL06</b>	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>DV-1000CBL *</b> RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>EA-2CBL</b> RS-232
		Port 2 DB15HD (female)		<b>DV-1000CBL * + FA-15HD</b> RS-232		<b>EA-2CBL-1</b> RS-232 ** See Diagram 1 RS-422
	D0-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>DV-1000CBL *</b> RS-232	Modbus RTU	** See Diagram 2 RS-485 Modbus only
		Port 2 DB15HD (female)		<b>DV-1000CBL * + FA-15HD</b> RS-232		** See Diagram 2 RS-485 Modbus only
		Port 1 RJ12 - 6 pin		<b>DV-1000CBL *</b> RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	<b>EA-2CBL</b> RS-232
		Port 2 DB15HD (female)		<b>DV-1000CBL * + FA-15HD</b> RS-232		<b>EA-2CBL-1</b> RS-232 ** See Diagram 1 RS-422
<b>DirectLOGIC DL105</b>	all versions	Port 1 RJ12 - 6 pin	K-sequence	<b>DV-1000CBL *</b> RS-232	K-sequence	<b>EA-2CBL</b> RS-232
		Port 2 RJ12 - 6 pin				

\* Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC source is required, however, screen brightness is diminished and the alarm beep will not function.

\*\* Note: Wiring Diagrams for user constructed cables start on page 6-26.

**DirectLOGIC DL205 PLCs, D2-DCM Module and WINPLC  
Panel Powered via external power supply, Port1 or Port2 Communications**

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			*PLC Port Powered or External DC Power Supply		External DC Power Supply	
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL205	D2-230	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL* RS-232	K-sequence	EA-2CBL RS-232
	D2-240	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL* RS-232	K-sequence	EA-2CBL RS-232
		Port 2 RJ12 - 6 pin	K-sequence, DirectNET		K-sequence, DirectNET	
	D2-250-1	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL* RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL* + FA-15HD RS-232		EA-2CBL-1 RS-232
						** See Diagram 1 RS-422
	D2-260	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL* RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL* + FA-15HD RS-232		EA-2CBL-1 RS-232
					** See Diagram 1 RS-422	
	D2-DCM	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	** See Diagram 3 RS-232	DirectNET	EA-4CBL-2 RS-232
						** See Diagram 6 RS-422
WINPLC	Port 1 RJ12 - 6 pin	Modbus RTU	DV-1000CBL* RS-232	Modbus RTU	EA-2CBL RS-232	
* Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC souce is required, however, screen brightness is diminished and the alarm beep will not function.						
** Note: Wiring Diagrams for user constructed cables start on page 6-26.						

**DirectLOGIC DL305 PLCs and D3-DCM Module****Panel Powered via external power supply, Port1 or Port2 Communications**

PLC Compatibility & Connection Chart							
PLC			C-more Micro-Graphic Panel				
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.				
			*PLC Port Powered or External DC Power Supply		External DC Power Supply		
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female		
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type	
DirectLOGIC DL305	D3-330 or D3-340	D3-232-DCU DB 25 pin (female)	DirectNET	EA-4CBL-2 RS-232	DirectNET	EA-4CBL-2 RS-232	
		D3-422-DCU DB 25 pin (female)	Not Possible		DirectNET	** See Diagram 6 RS-422	
	D3-340	Port 1 RJ11 - 4 pin	DirectNET	OP-3CBL-1 RS-232	DirectNET	EA-3CBL RS-232	
		Port 2 RJ11 - 4 pin	DirectNET, Modbus RTU		DirectNET, Modbus RTU		
	D3-350	Port 1 RJ12 - 6 pin	K-sequence, DirectNET	DV-1000CBL * RS-232	K-sequence, DirectNET	EA-2CBL RS-232	
		Port 2 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	** See Diagram 3 RS-232	K-sequence, DirectNET, Modbus RTU	EA-4CBL-2 RS-232 ** See Diagram 4 RS-422	
	D3-DCM D3-350 only	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	** See Diagram 3 RS-232	DirectNET	EA-4CBL-2 RS-232	
						** See Diagram 6 RS-422	
	* Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC souce is required, however, screen brightness is diminished and the alarm beep will not function.						
	** Note: Wiring Diagrams for user constructed cables start on page 6-26.						

## DirectLOGIC DL405 PLCs and D4-DCM Module

### Panel Powered via external power supply, Port1 or Port2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			*PLC Port Powered or External DC Power Supply		External DC Power Supply	
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL405	D4-430	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL * & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET	DV-1000CBL * & FA-CABKIT RS-232	K-sequence, DirectNET	EA-4CBL-2 RS-232 ** See Diagram 4 RS-422
	D4-440	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL * & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET	DV-1000CBL * & FA-CABKIT RS-232	K-sequence, DirectNET	EA-4CBL-2 RS-232 ** See Diagram 4 RS-422
	D4-450	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL * & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	DV-1000CBL * & FA-CABKIT RS-232	K-sequence, DirectNET, Modbus RTU	EA-4CBL-2 RS-232 ** See Diagram 4 RS-422
		Port 3 DB 25 pin (female)	Not Possible		K-sequence, DirectNET, Modbus RTU	** See Diagram 5 RS-422
		Port 2 RJ12 - 6 pin	K-sequence, DirectNET	DV-1000CBL * RS-232	K-sequence, DirectNET	EA-2CBL RS-232
	D4-DCM	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	** See Diagram 3 RS-232	DirectNET	EA-4CBL-2 RS-232 ** See Diagram 6 RS-422
* Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC souce is required, however, screen brightness is diminished and the alarm beep will not function.						
** Note: Wiring Diagrams for user constructed cables start on page 6-26.						

## Allen-Bradley PLCs

## Panel Powered via external power supply, Port1 or Port2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			External DC Power Supply			
			Powered from an external 24 VDC source			
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
Allen-Bradley MicroLogix	1000, 1100, 1200, 1500	8-pin mini-din port	Not Possible		DF1 Full Duplex, DF1 Half Duplex	EA-MLOGIX-CBL RS-232
		RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232
Allen-Bradley SLC500	5/03, 5/04, 5/05	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
	5/01, 5/02, 5/03	RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232
Allen-Bradley ControlLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley CompactLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley FlexLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley PLC5	all	25-pin D-sub port			DF1 Full Duplex	EA-PLC5-232-CBL RS-232
		RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232



## GE, Mitsubishi, Omron, Modicon and Siemens PLCs Panel Powered via external power supply, Port1 or Port2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	PLC Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			External DC Power Supply			
			Powered from an external 24 VDC source.			
			Using panel's RJ12 Port1		Using panel's Port2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
GE	90/30, 90/70	15-pin D-sub port	Not Possible		SNPX	EA-90-30-CBL RS-422
	Micro 90, VersaMax Micro	RJ45 Port 1				** See Diagram 12 RS-232
		15-pin D-sub port Port 2				EA-90-30-CBL RS-422
Mitsubishi	Melsec FX Series	25-pin D-sub port			CPU Direct	EA-MITSU-CBL RS-422
		8-pin mini-din port				EA-MITSU-CBL-1 RS-422
Omron	C200 (Adapter), C500	25-pin D-sub port			Host Link	EA-OMRON-CBL RS-232
	CJ1, CS1, CQM1, CPM1, CPM2 C200 CPU	9-pin D-sub port			Host Link FINS	** See Diagram 7 & 8 RS-232
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU	varies			Modbus RTU	** See Diagram 9, 10 & 11 RS-232
Siemens	S7-200 CPU	9-pin D-sub port 0 or 1			PPI	** See Diagram 13 RS-485

\*\* Note: Wiring Diagrams for user constructed cables start on page 6-26.

## Cables from AutomationDirect

Cable Description	Cable Part No.
<b>Cables used with serial Port1</b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	<b>DV-1000CBL</b>
<b>Note: The PLC can provide 5 VDC through this cable. No external 12-24 VDC source is required, however, screen brightness is diminished and the alarm beep will not function.</b>	
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	<b>D4-1000CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) <b>Use with DV-1000CBL cable.</b>	<b>FA-15HD</b>
<b>Direct</b> LOGIC PLC 15-pin D-sub port, DL405 (RS-232C).	<b>FA-CABKIT</b>
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>OP-3CBL-1</b>

Cable Description	Cable Part No.
<b>Cables used with serial Port2</b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	<b>EA-2CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).	<b>EA-2CBL-1</b>
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>EA-3CBL</b>
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).	<b>EA-4CBL-1</b>
<b>Direct</b> LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C).	<b>EA-4CBL-2</b>
Allen-Bradley MicroLogix 1000, 1100, 1200 & 1500 (RS-232C)	<b>EA-MLOGIX-CBL</b>
Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C)	<b>EA-SLC-232-CBL</b>
Allen-Bradley PLC-5 DF1 port (RS-232C)	<b>EA-PLC5-232-CBL</b>
Allen-Bradley MicroLogix, SLC 5-01/02/03, PLC5 DH485 port (RS-232C)	<b>EA-DH485-CBL</b>
GE 90/30, 90/70, Micro 90, Versamax Micro (Port2) 15-pin D-sub port (RS-422A)	<b>EA-90-30-CBL</b>
MITSUBISHI FX Series 25-pin port (RS-422A)	<b>EA-MITSU-CBL</b>
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	<b>EA-MITSU-CBL-1</b>
OMRON Host Link (C200 Adapter, C500) (RS-232C)	<b>EA-OMRON-CBL</b>



Part No. EA-2CBL



Part No. EA-2CBL-1



Part No. EA-3CBL



Part No. EA-4CBL-1



Part No. EA-4CBL-2

## Cables from *AutomationDirect* (cont'd)



Part No. DV-1000CBL



Part No. OP-3CBL-1



Part No. FA-15HD



Part No. FA-CABKIT



Part No. D4-1000CBL



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



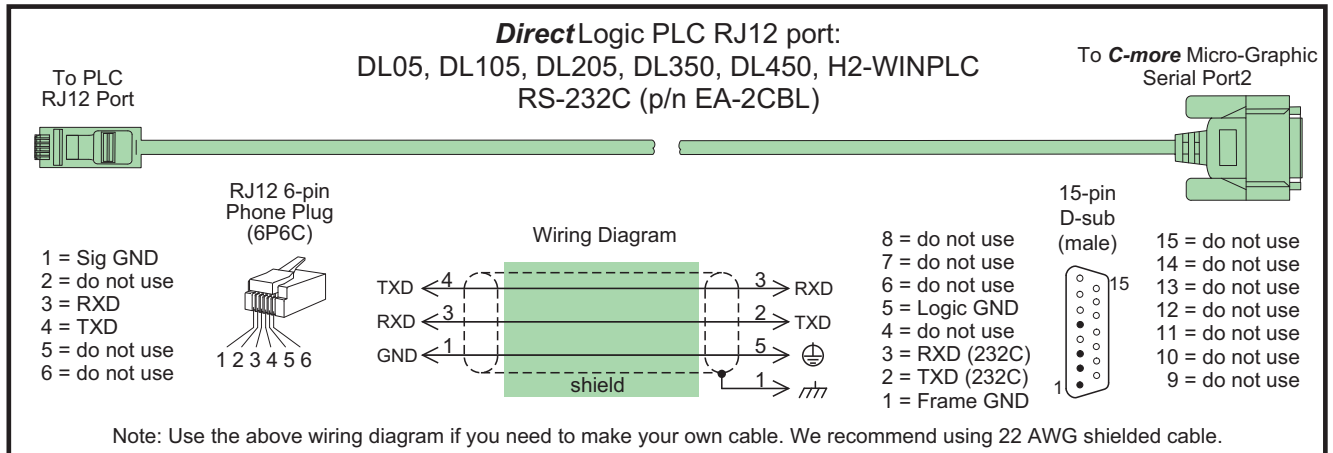
Part No. EA-OMRON-CBL

## Cables from AutomationDirect – Wiring Diagrams

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

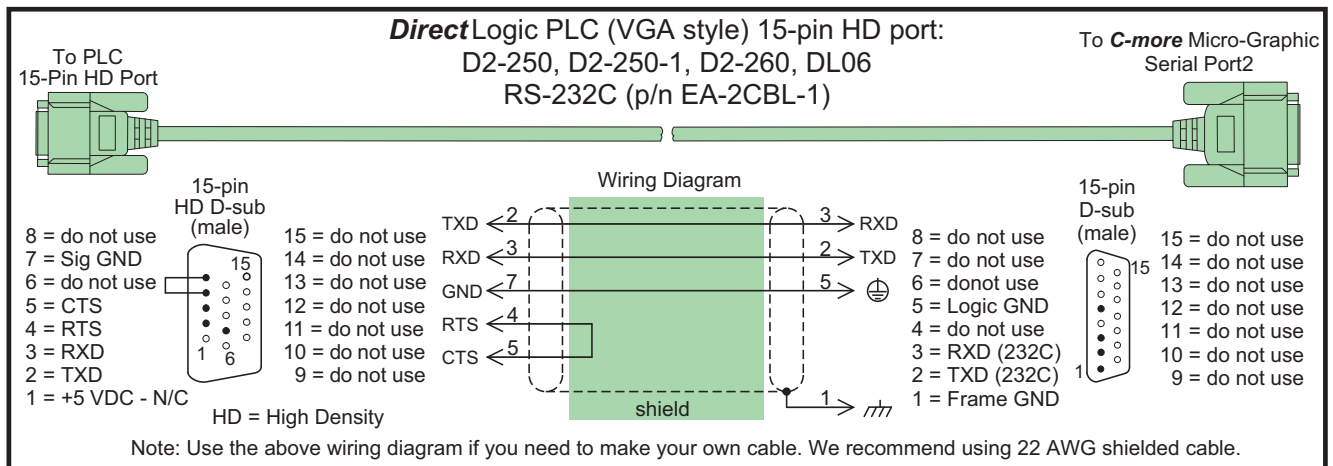
### DirectLOGIC:

### EA-2CBL



### DirectLOGIC:

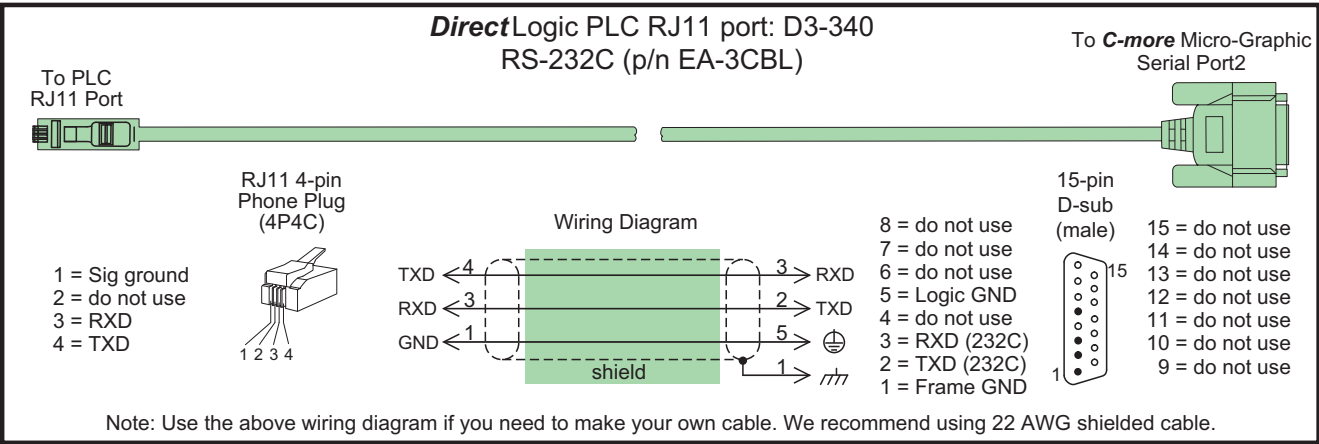
### EA-2CBL-1



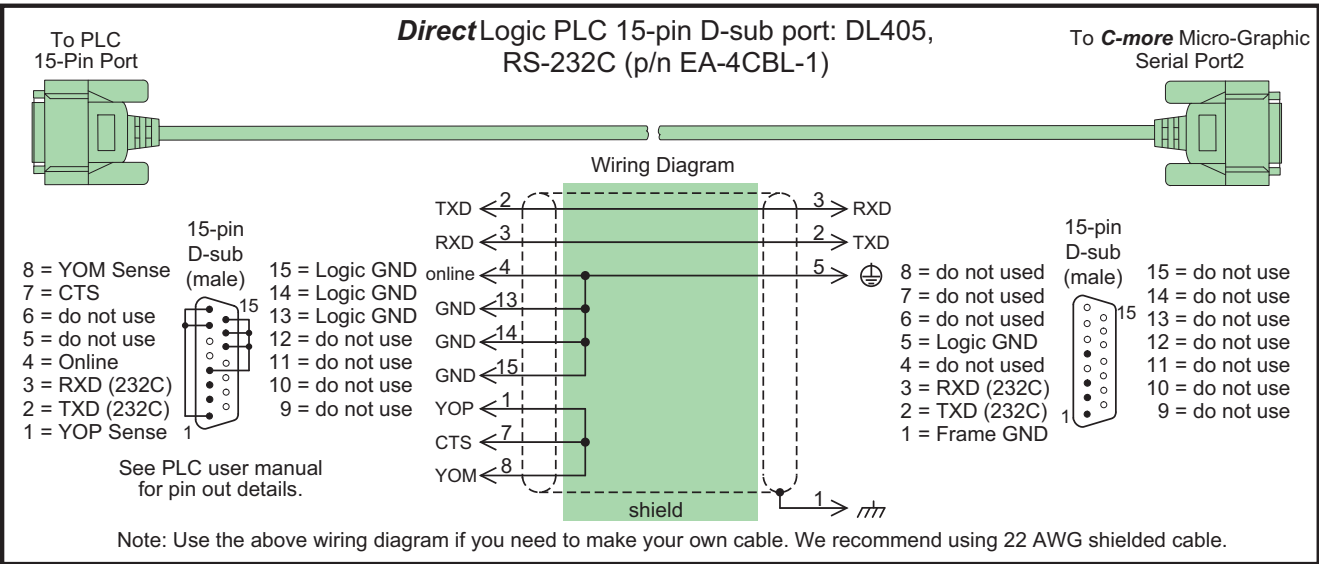
# Cables from AutomationDirect – Wiring Diagrams (cont'd)

## DirectLOGIC:

## EA-3CBL



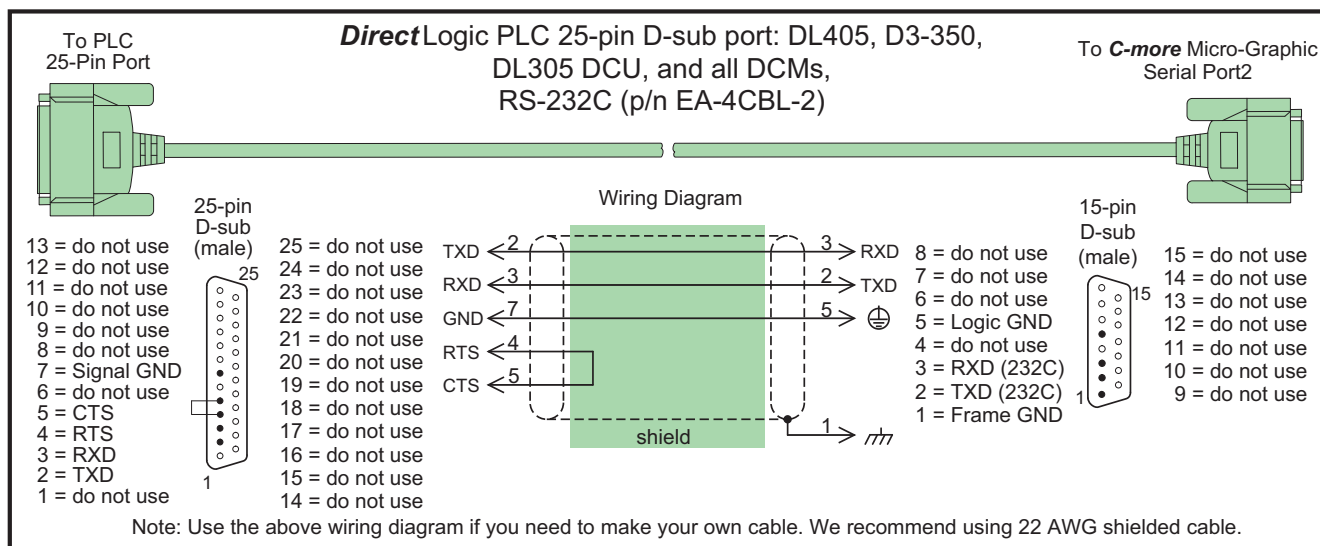
## EA-4CBL-1



## Cables from AutomationDirect – Wiring Diagrams (cont'd)

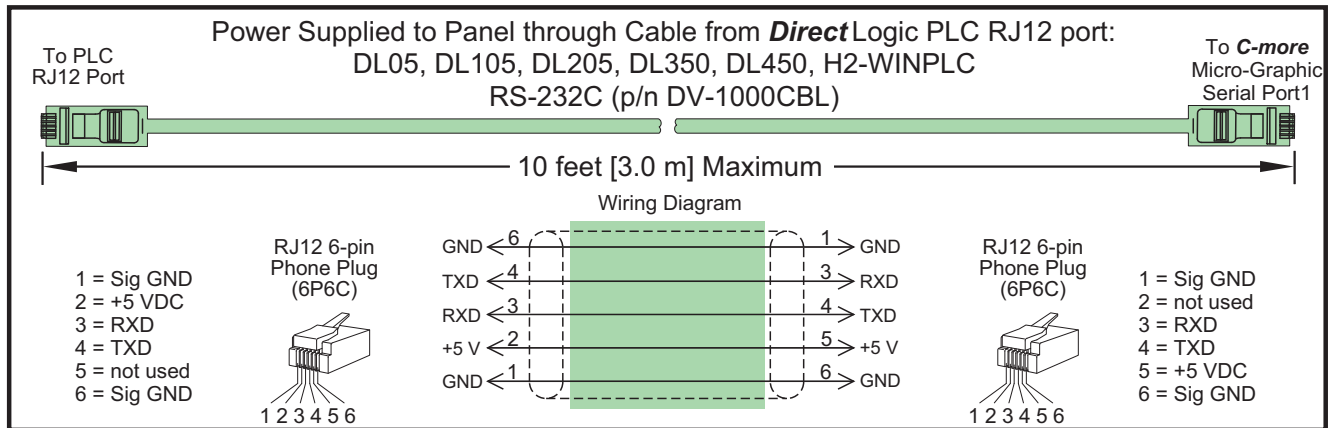
### DirectLOGIC:

### EA-4CBL-2

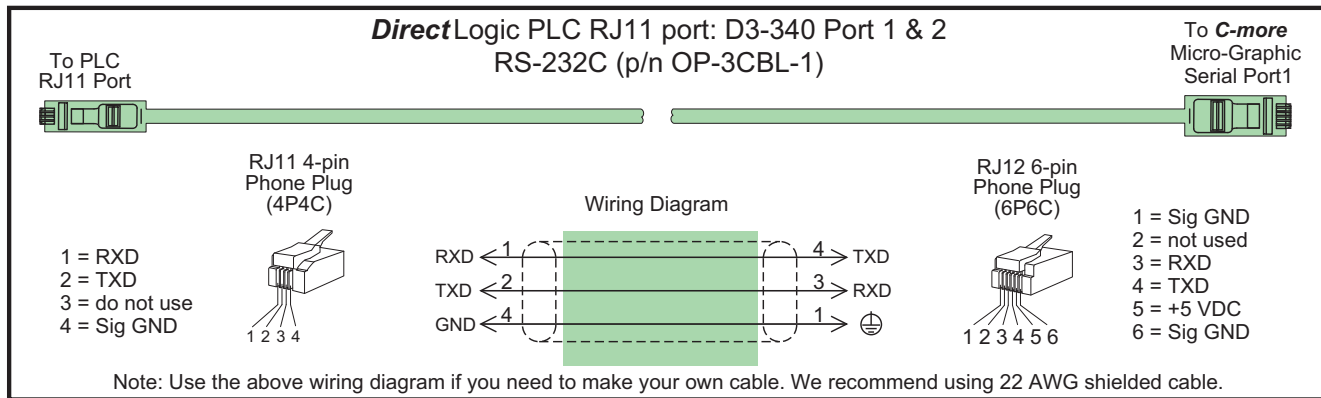


## Cables from *AutomationDirect* – Wiring Diagrams (cont'd)

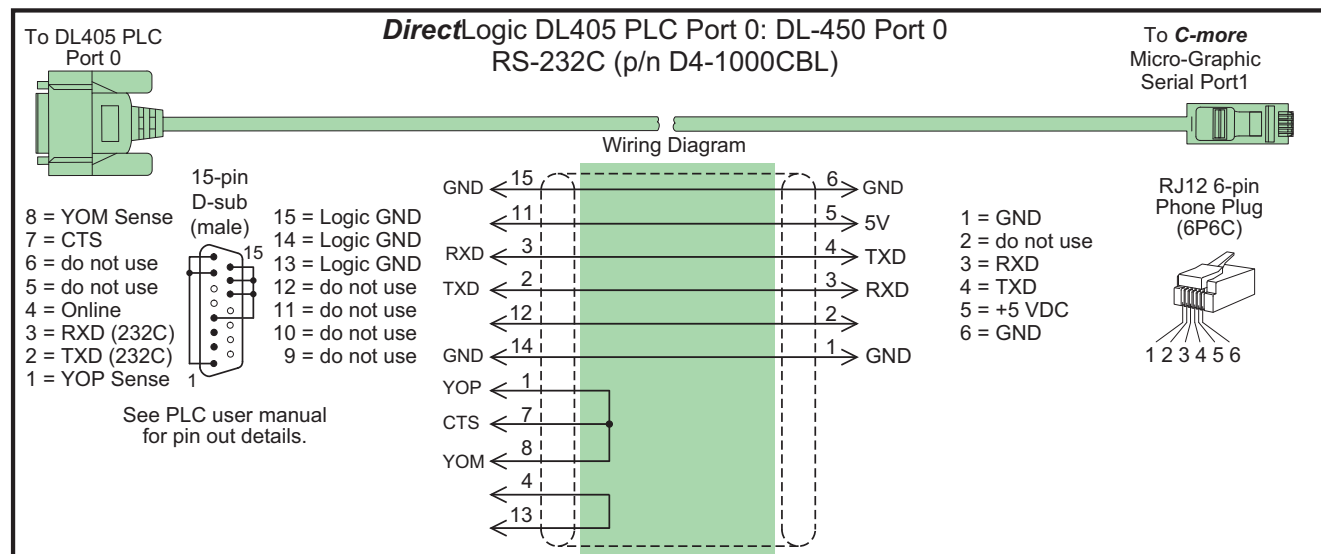
### DV-1000CBL



### OP-3CBL-1



### D4-1000CBL





# Cables from AutomationDirect - Wiring Diagrams (cont'd)

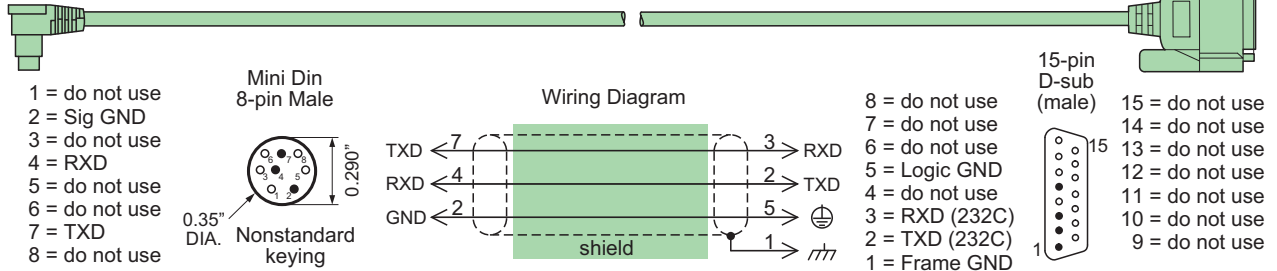
## Allen-Bradley:

## EA-MLOGIX-CBL

To AB MicroLogix RS-232 communication channel

Allen-Bradley MicroLogix™ 1000/1100/1200/1500  
RS-232C (p/n EA-MLOGIX-CBL)

To C-more Micro-Graphic Serial Port2

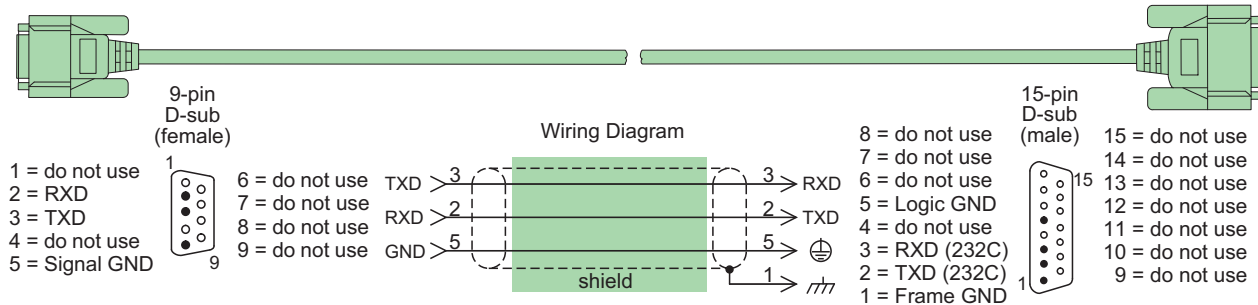


## EA-SLC-232-CBL

To PLC 9-Pin Port

Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix, DF1, RS-232C (p/n EA-SLC-232-CBL)

To C-more Micro-Graphic Serial Port2

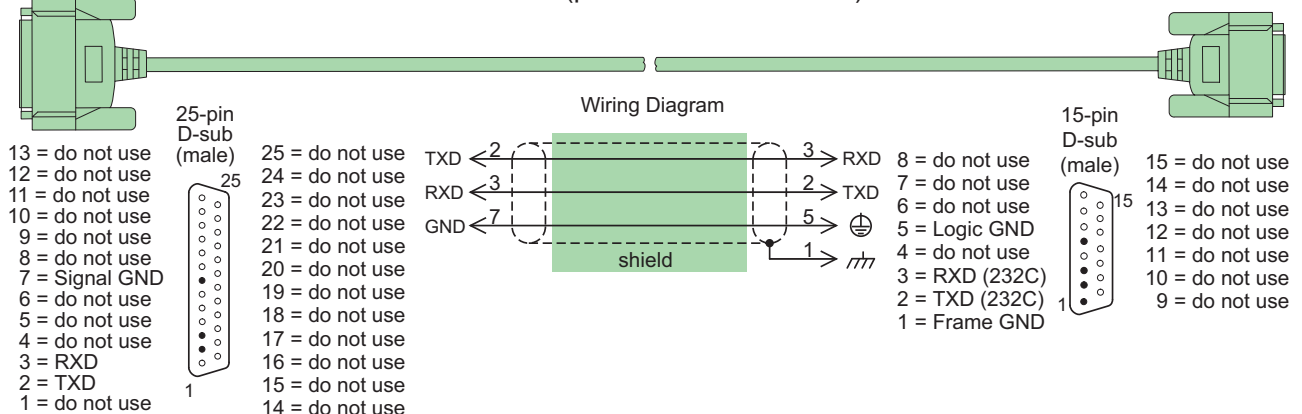


## EA-PLC5-232-CBL

To PLC 25-Pin Port

Allen-Bradley PLC5, DF1, RS-232C (p/n EA-PLC5-232-CBL)

To C-more Micro-Graphic Serial Port2

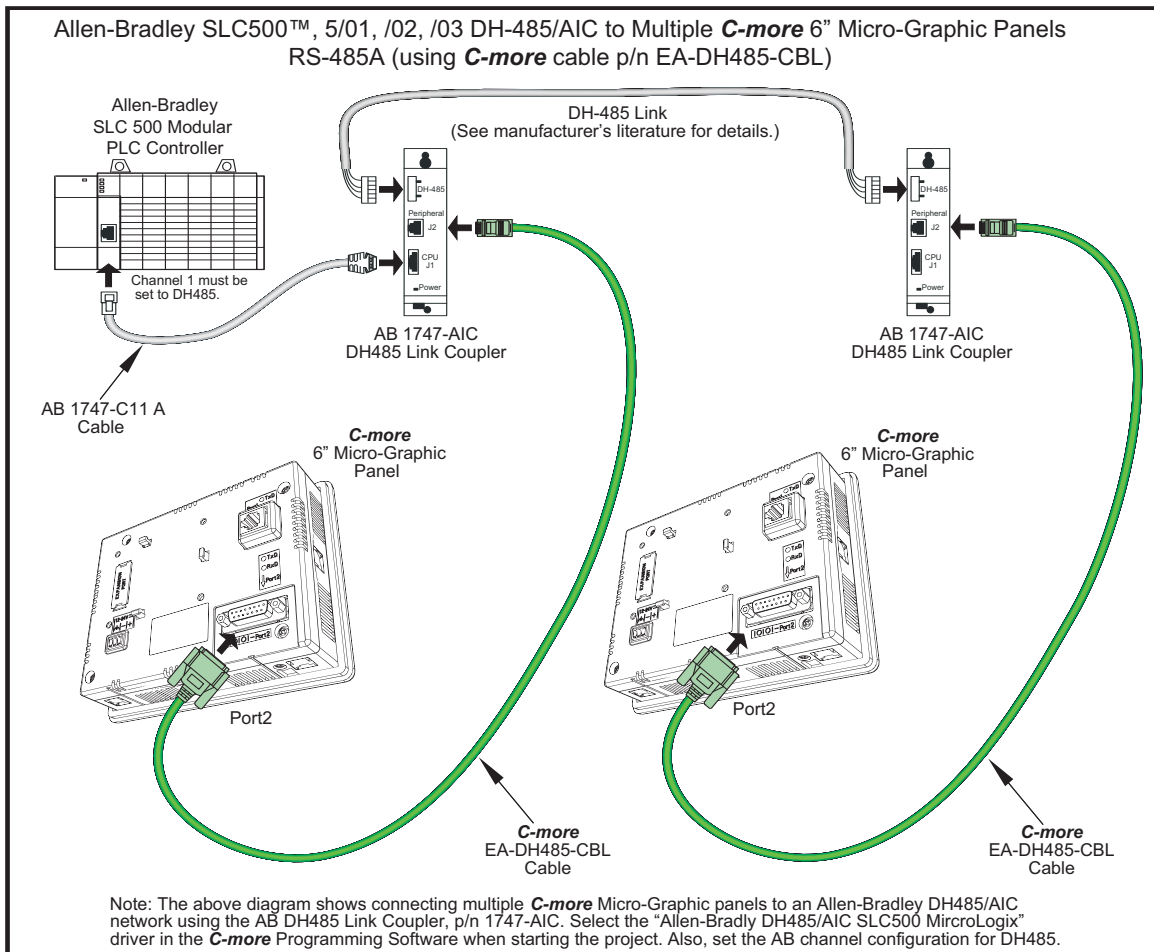
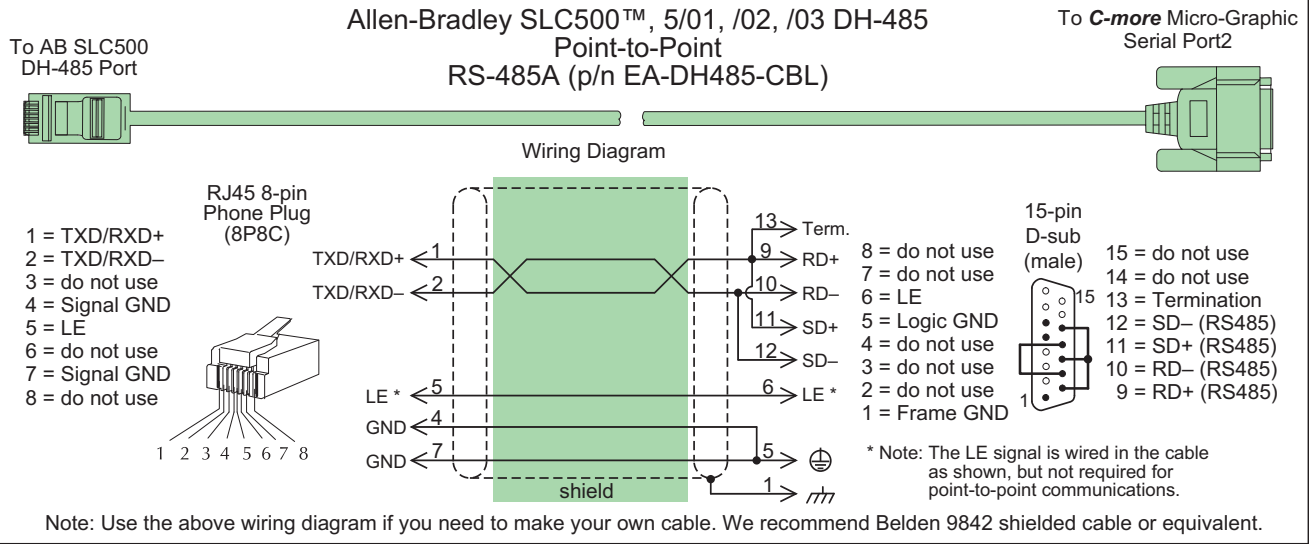




# Cables from AutomationDirect - Wiring Diagrams (cont'd)

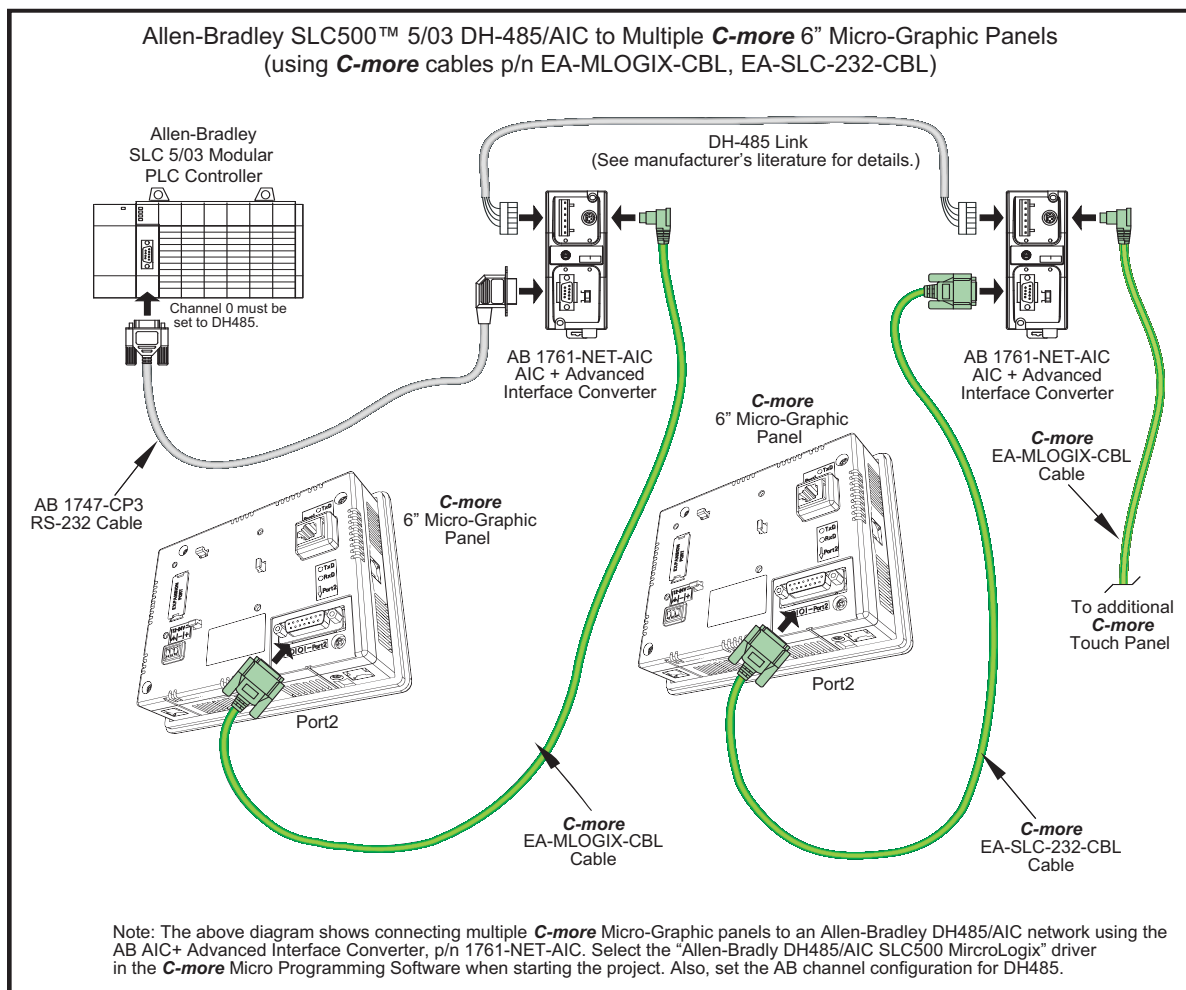
Allen-Bradley:

EA-DH485-CBL



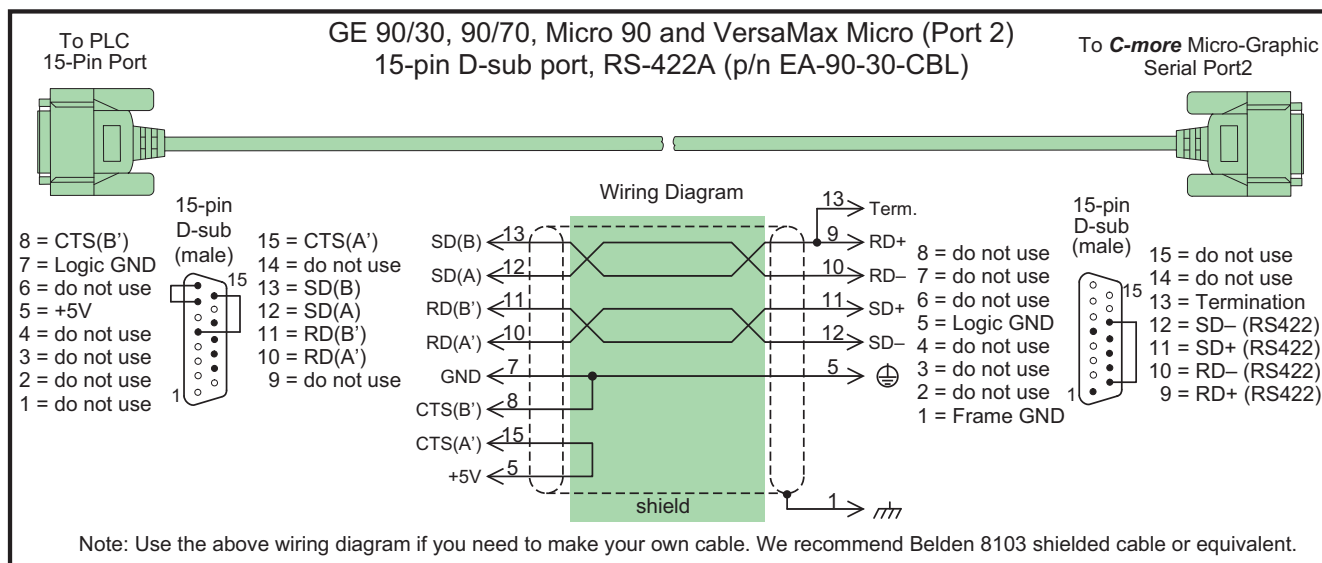
## Cables from AutomationDirect - Wiring Diagrams (cont'd)

### Allen-Bradley:

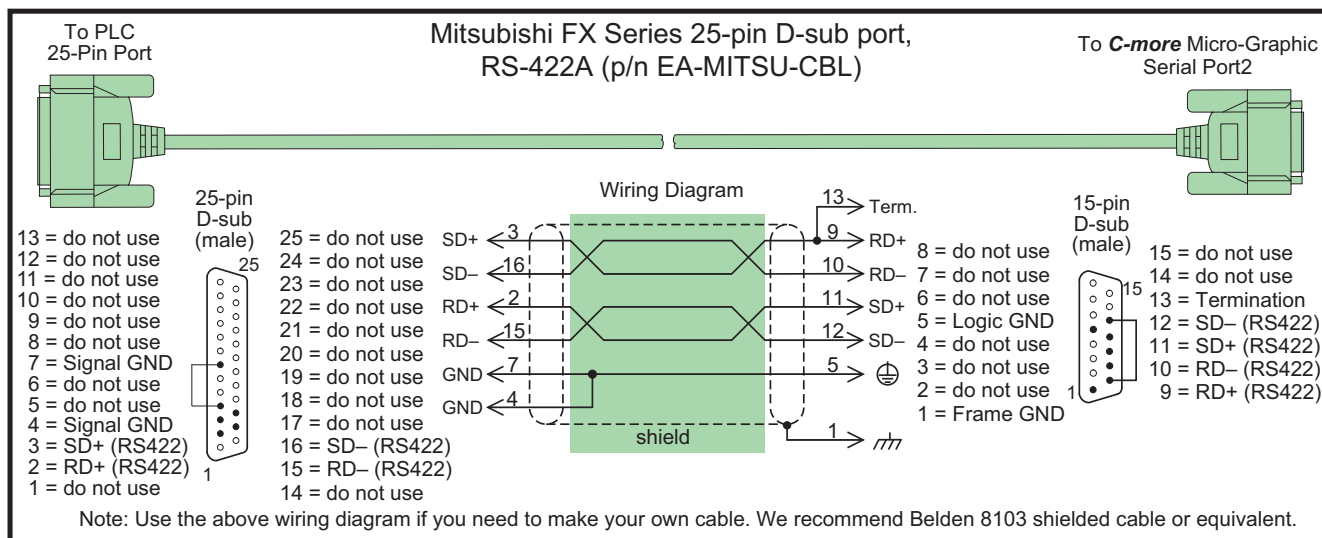


## Cables from AutomationDirect - Wiring Diagrams (cont'd)

GE:

**EA-90-30-CBL**

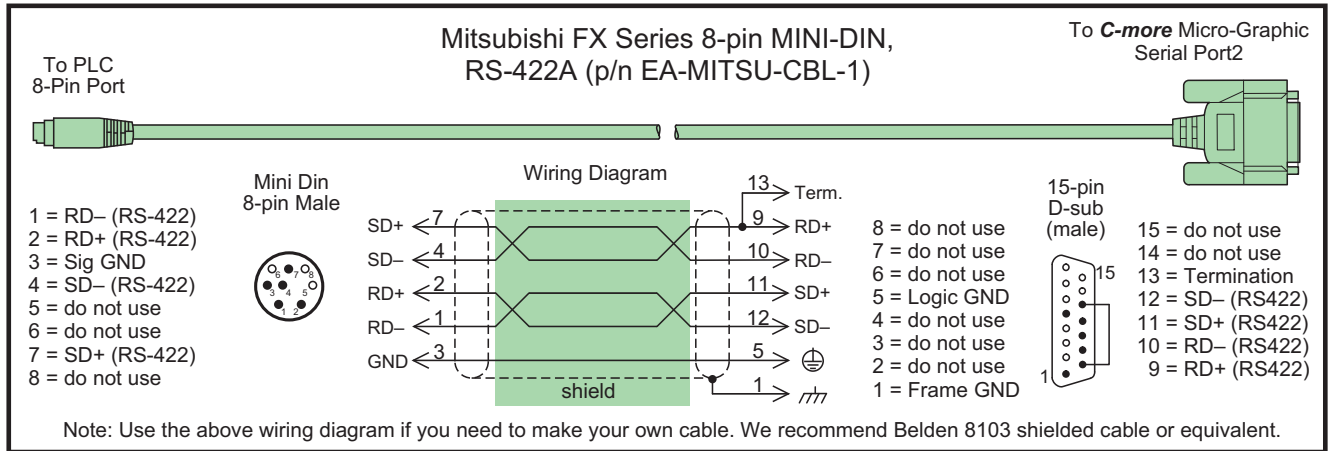
Mitsubishi:

**EA-MITSU-CBL**

# Cables from AutomationDirect - Wiring Diagrams (cont'd)

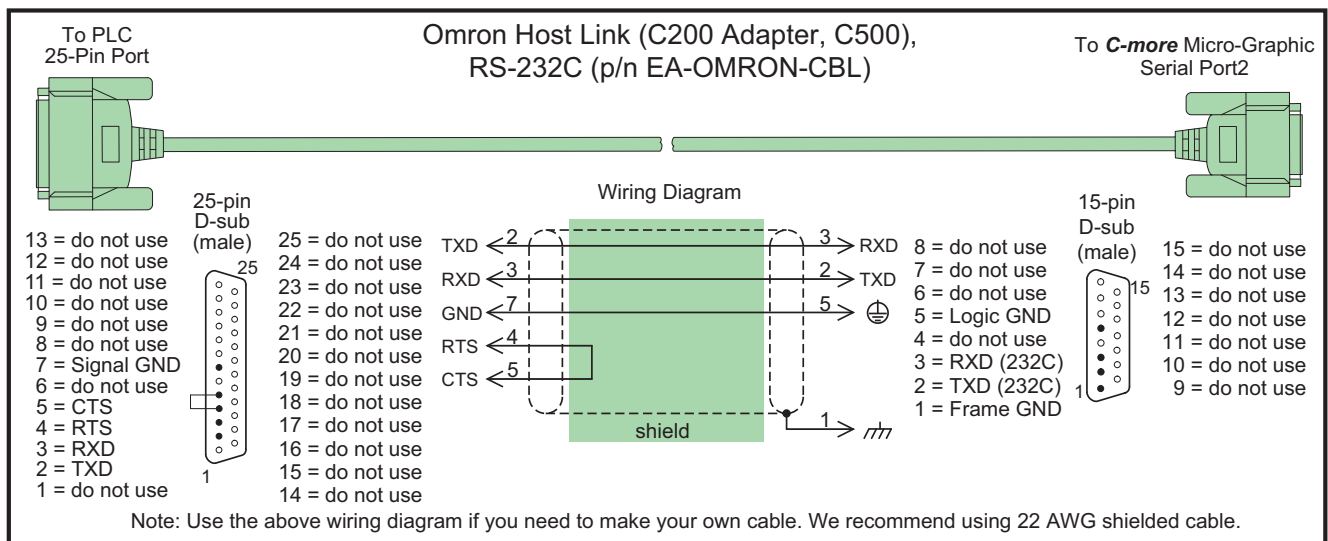
Mitsubishi:

**EA-MITSU-CBL-1**



Omron:

**EA-OMRON-CBL**



## User Constructed Cables – Wiring Diagrams

Diagram 1

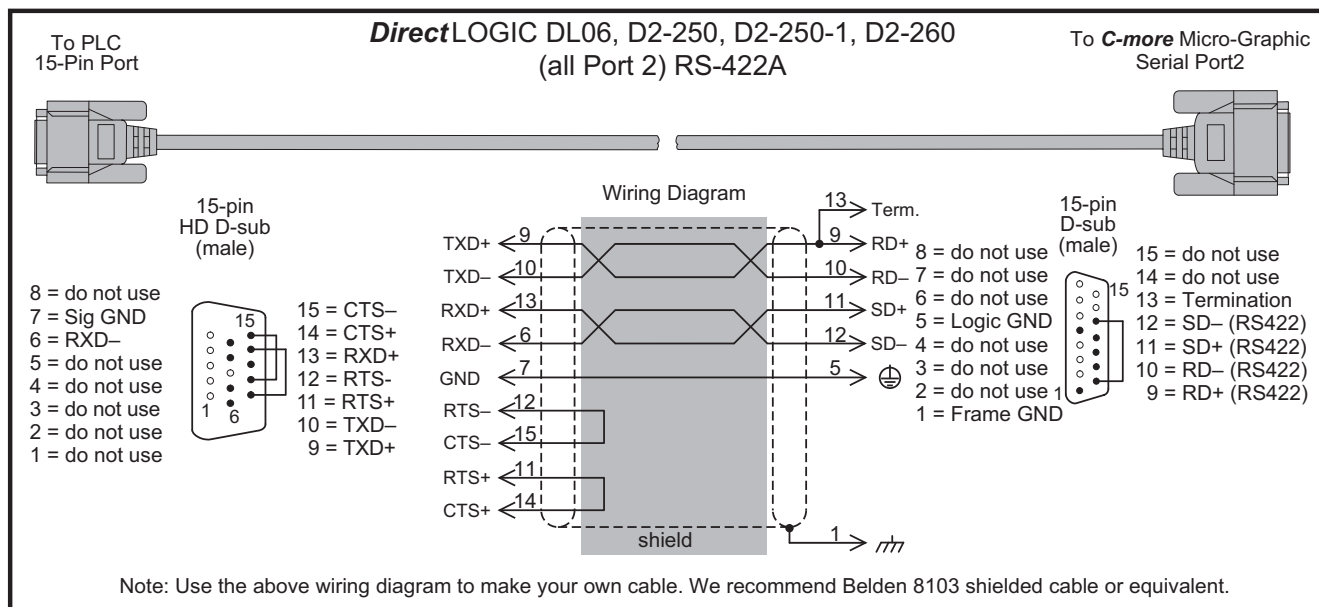
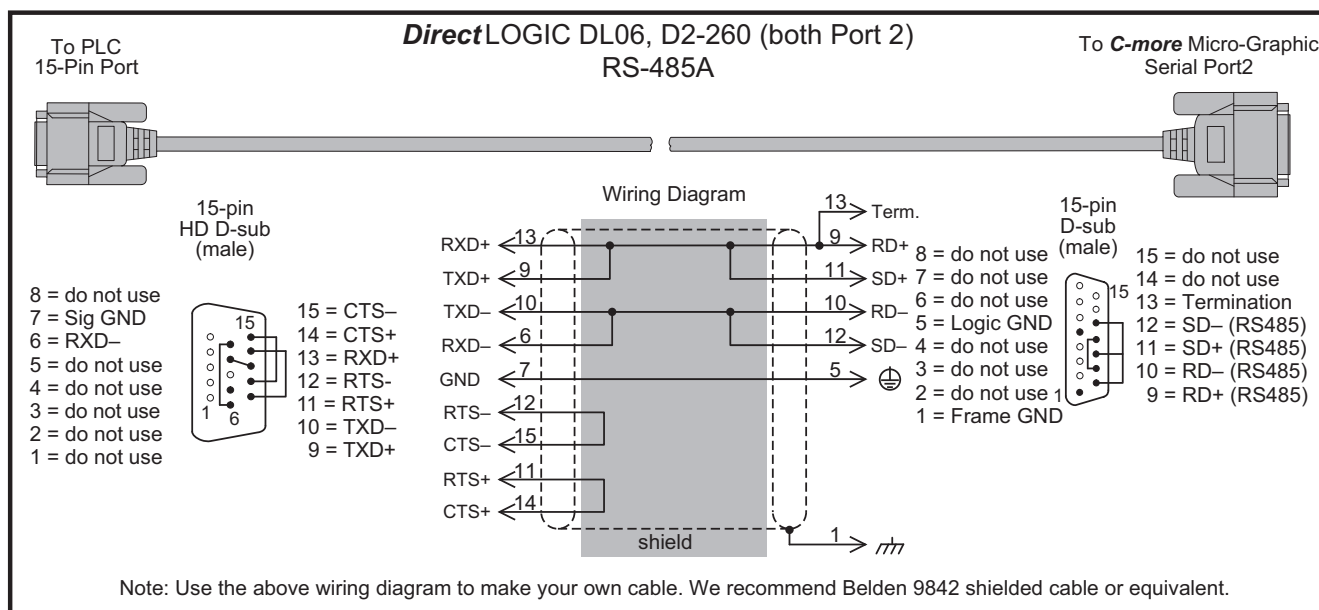
**User Constructed**

Diagram 2

**User Constructed**

**NOTE:** The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-38 if more than one PLC will be connected to a panel.

# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 3

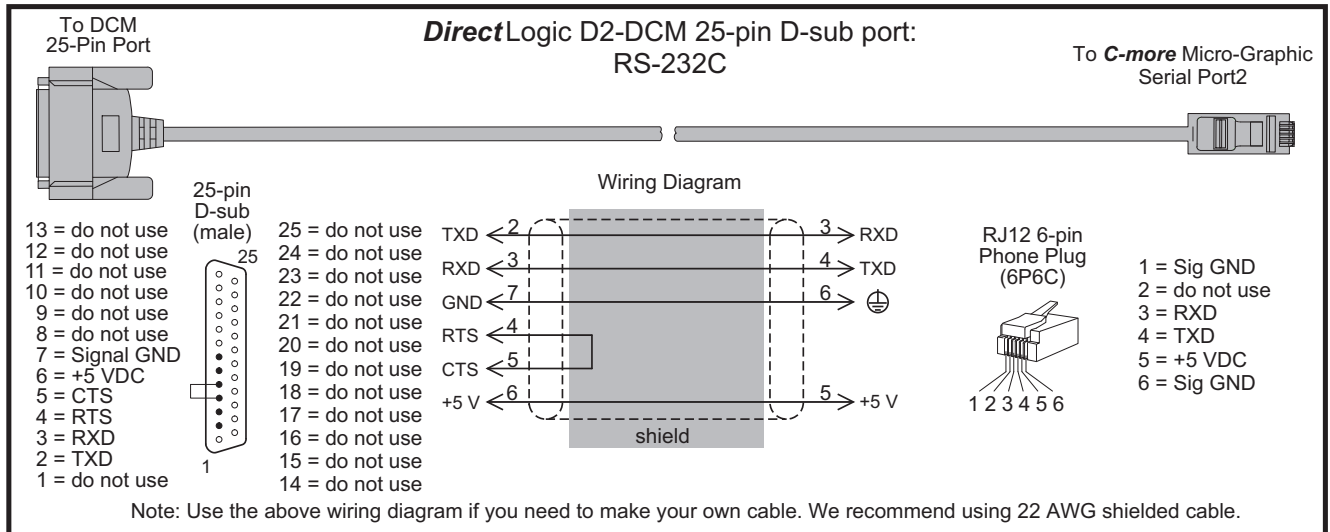
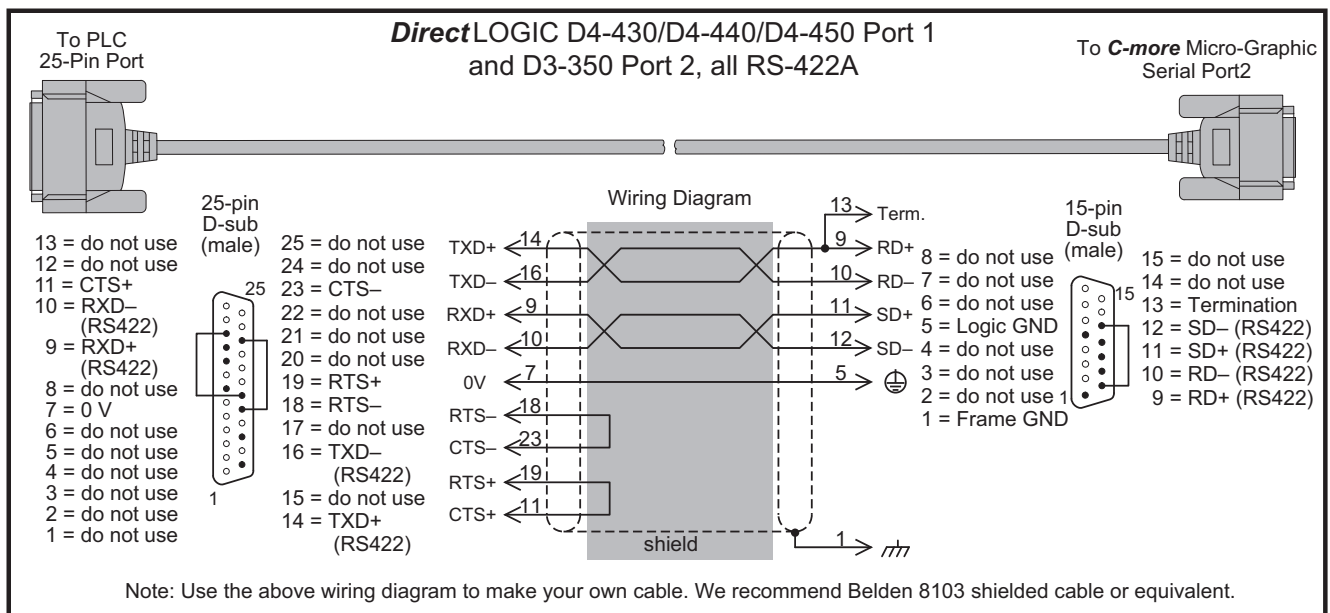
**User Constructed**

Diagram 4

**User Constructed**

**NOTE:** The RS-422 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-38 if more than one PLC will be connected to a panel.

# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 5

User Constructed

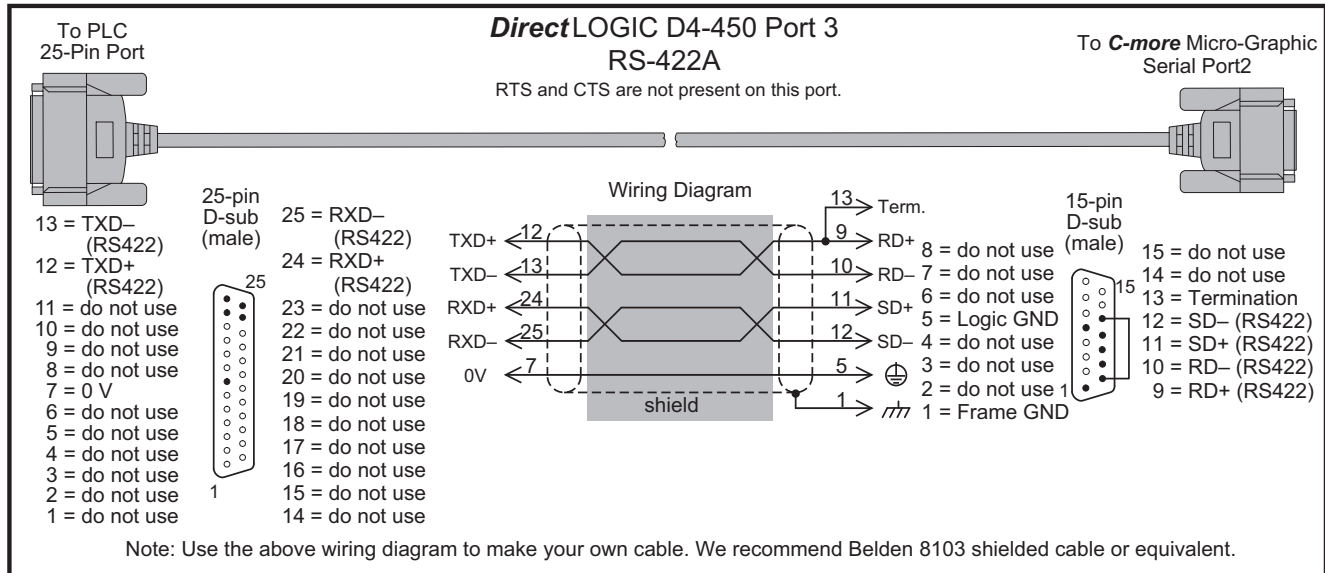
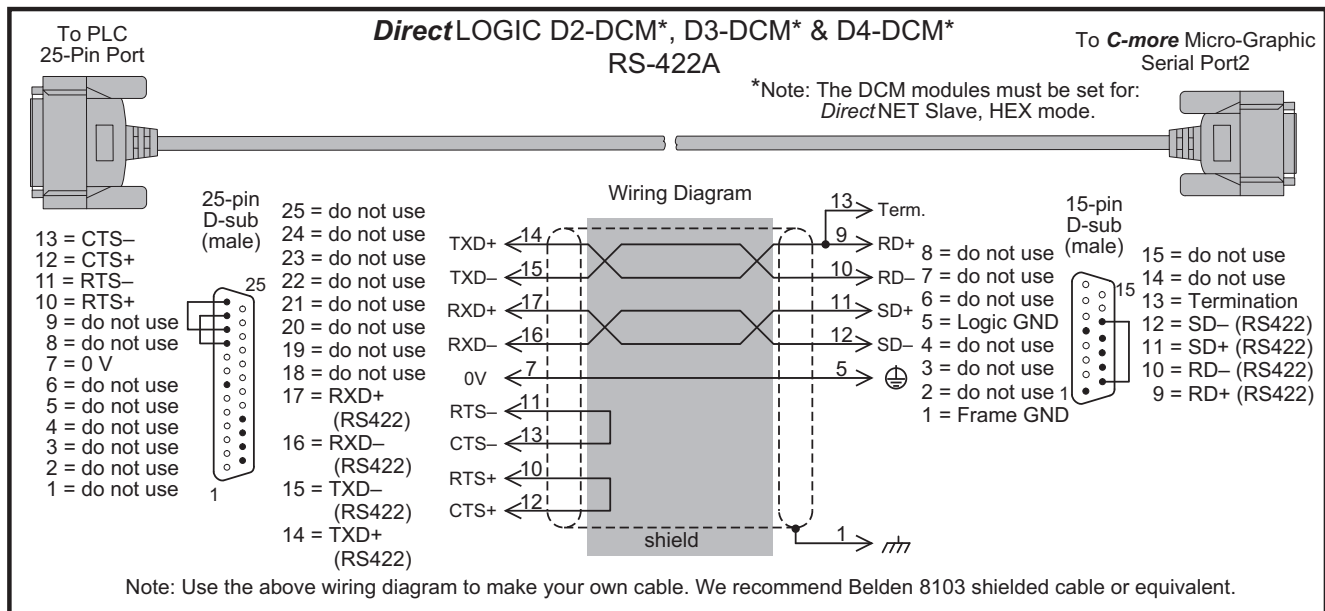


Diagram 6

User Constructed



**NOTE:** The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-38 if more than one PLC will be connected to a panel.



# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 7

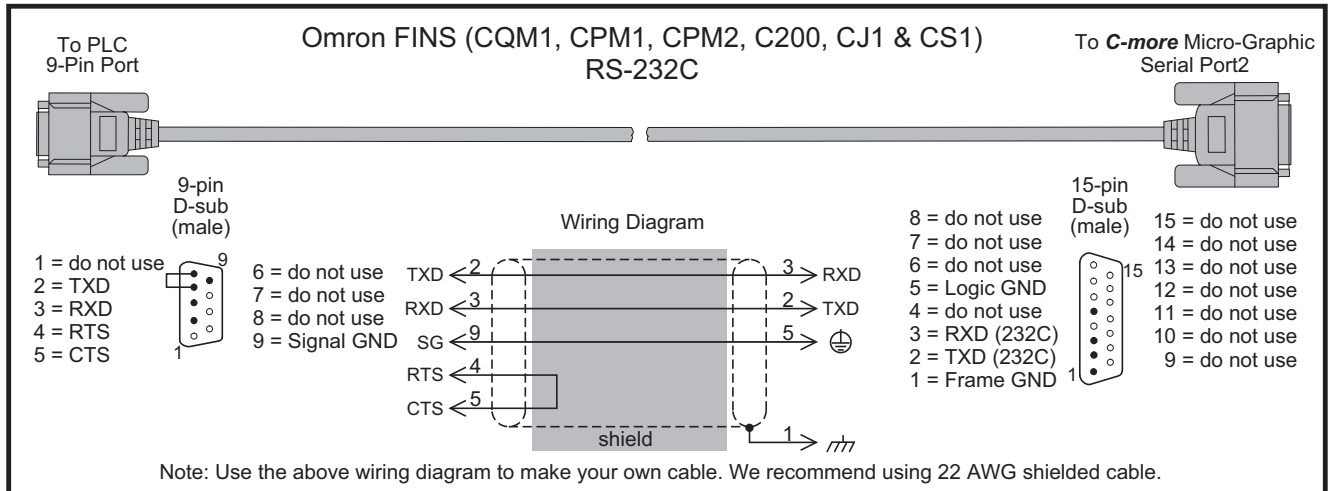
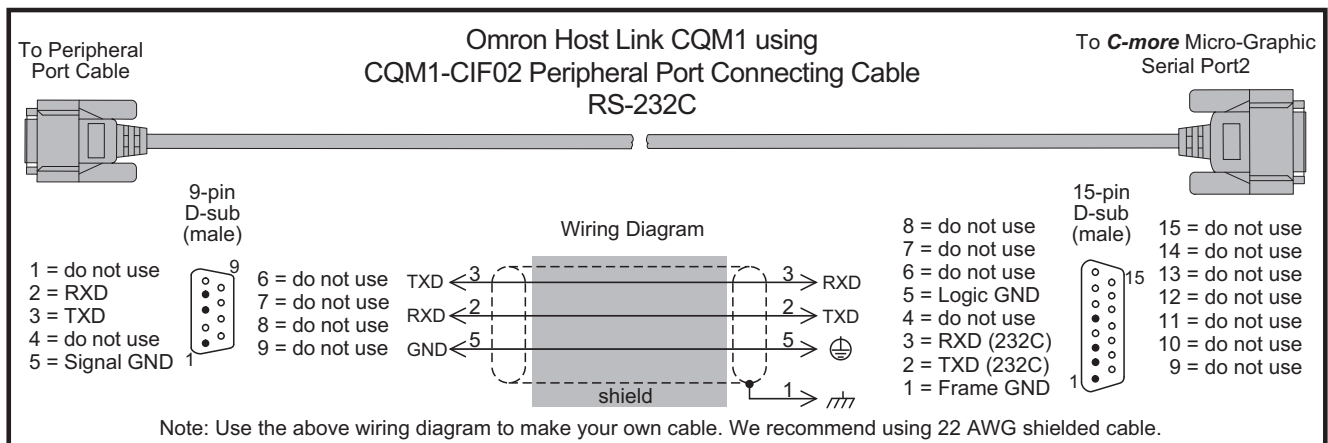
**User Constructed**

Diagram 8

**User Constructed**



# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 9

User Constructed

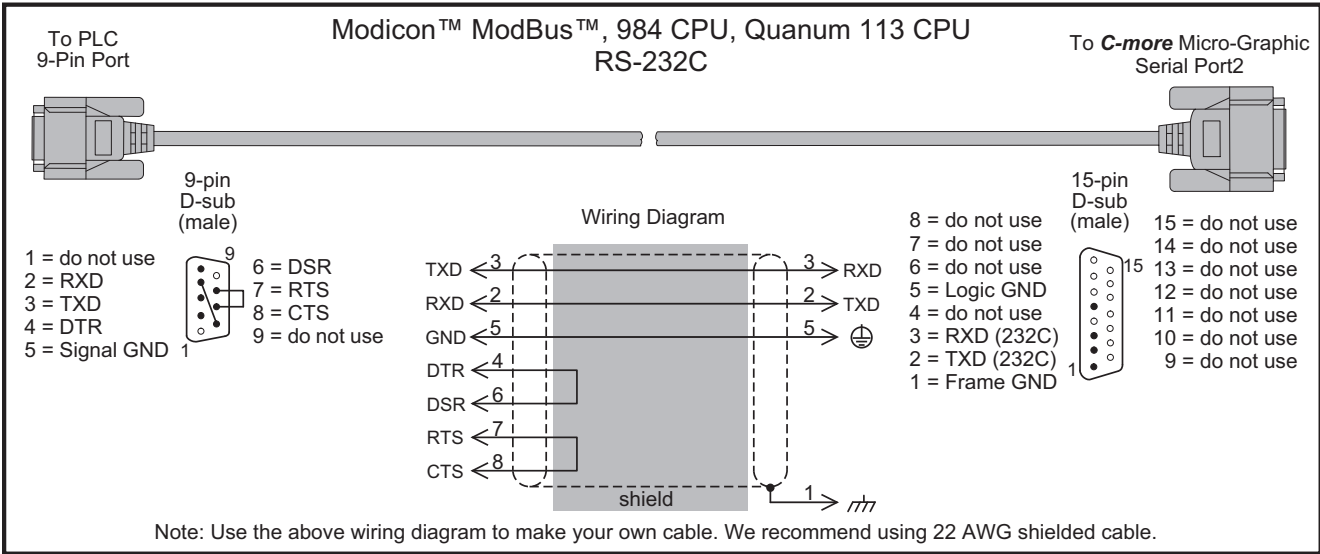
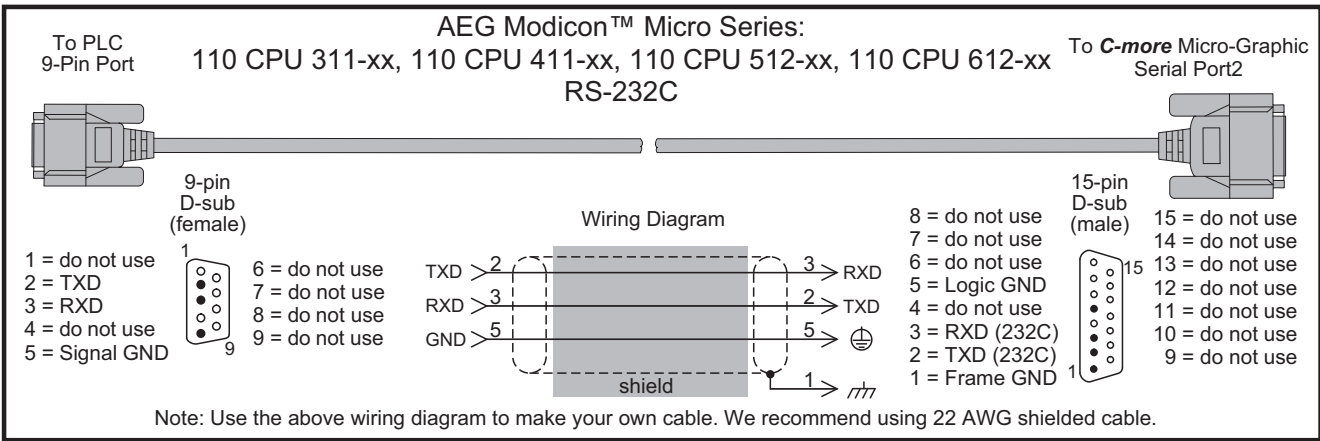


Diagram 10

User Constructed



# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 11

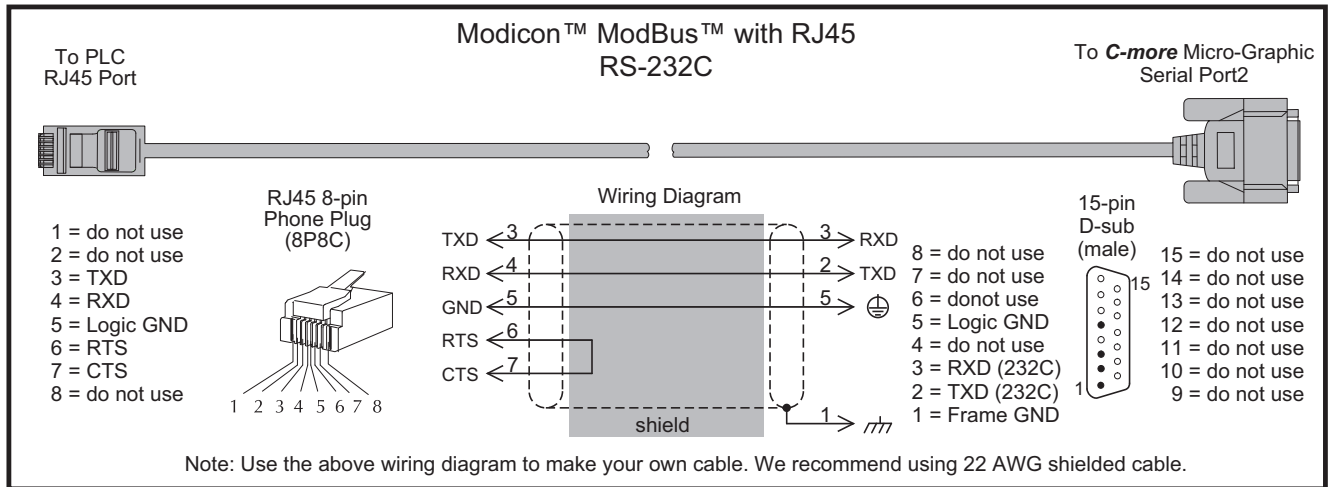
**User Constructed**

Diagram 12

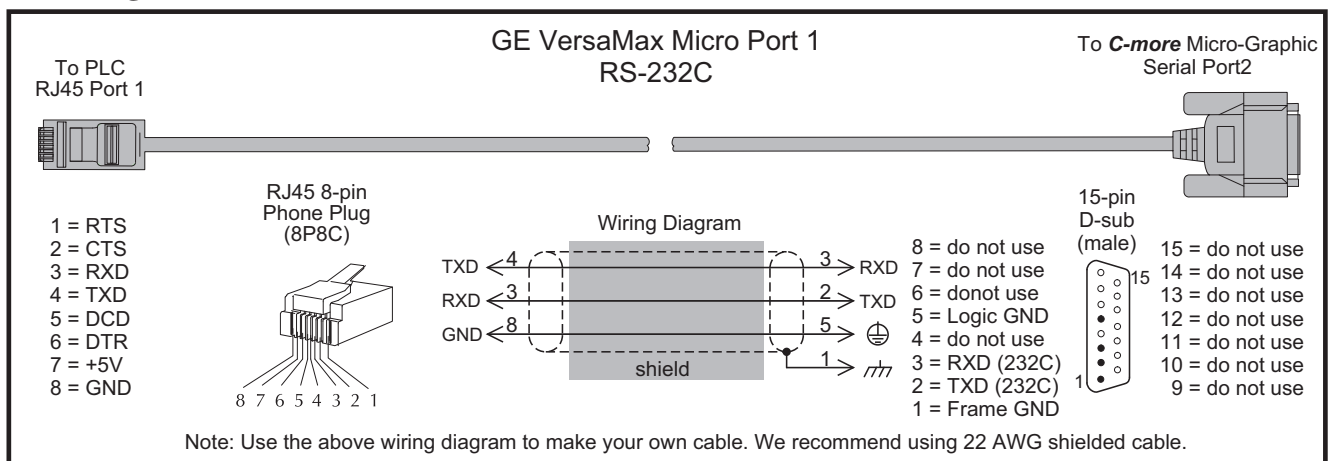
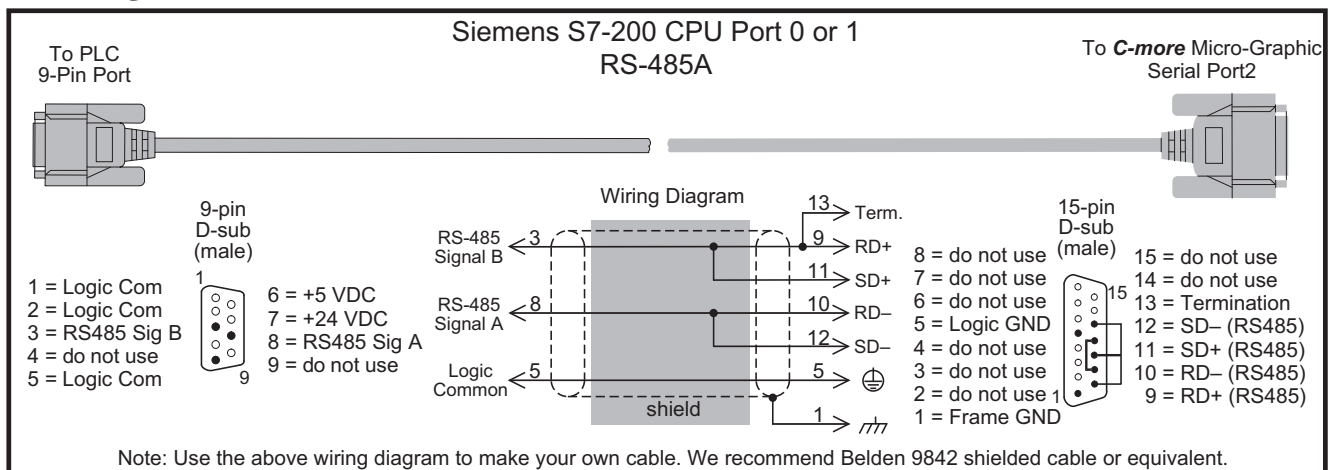
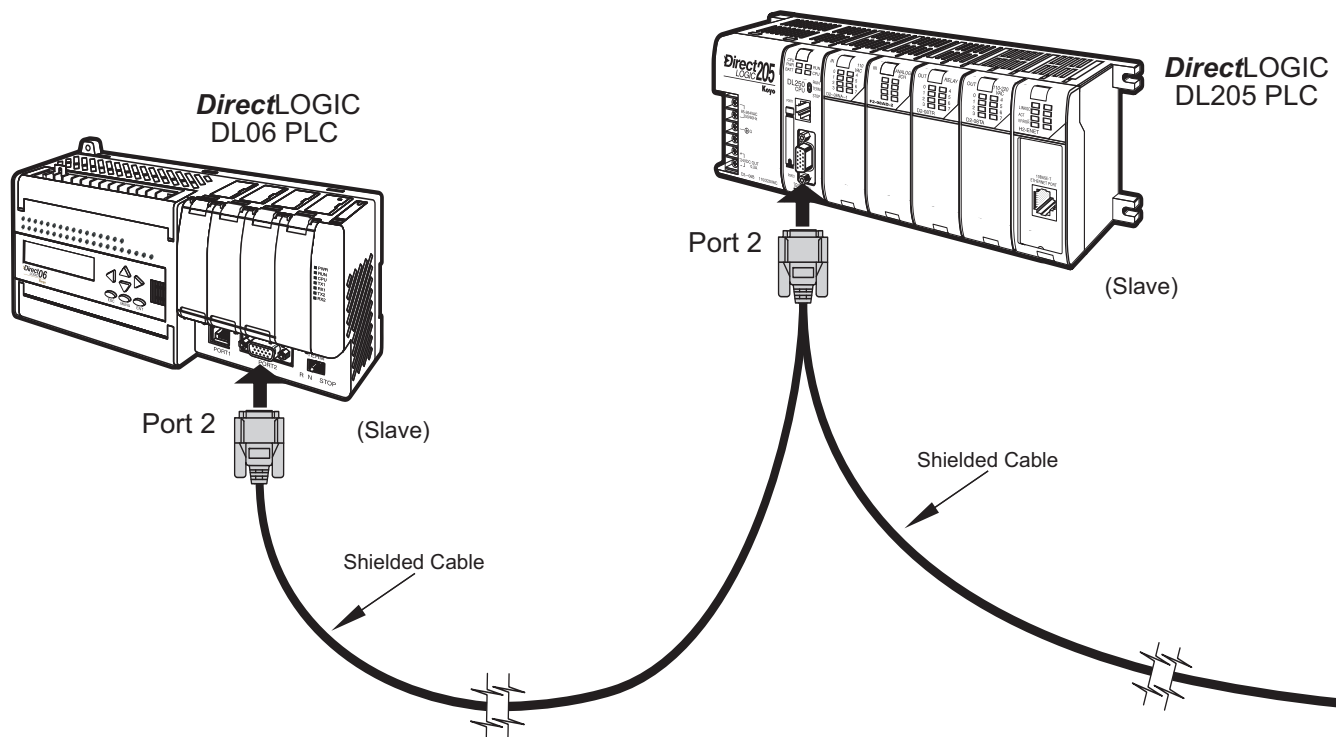
**User Constructed**

Diagram 13

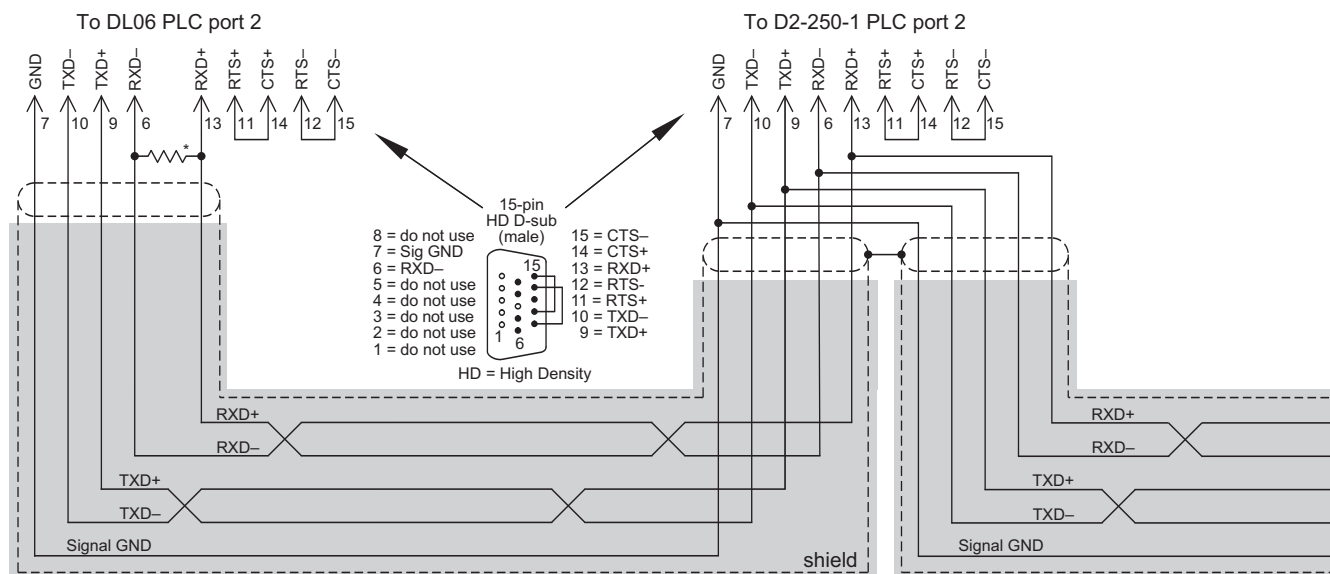
**User Constructed**

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

6



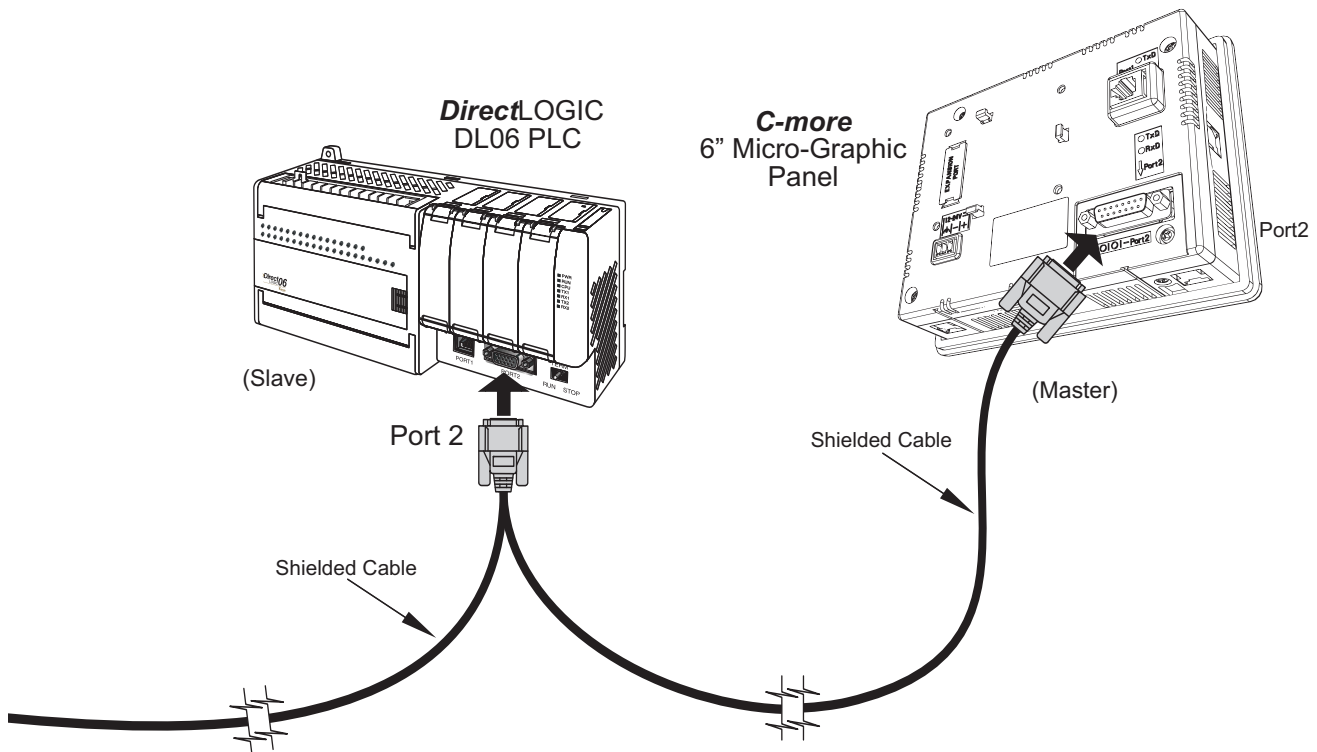
Note: We recommend Belden 8103 shielded cable or equivalent.



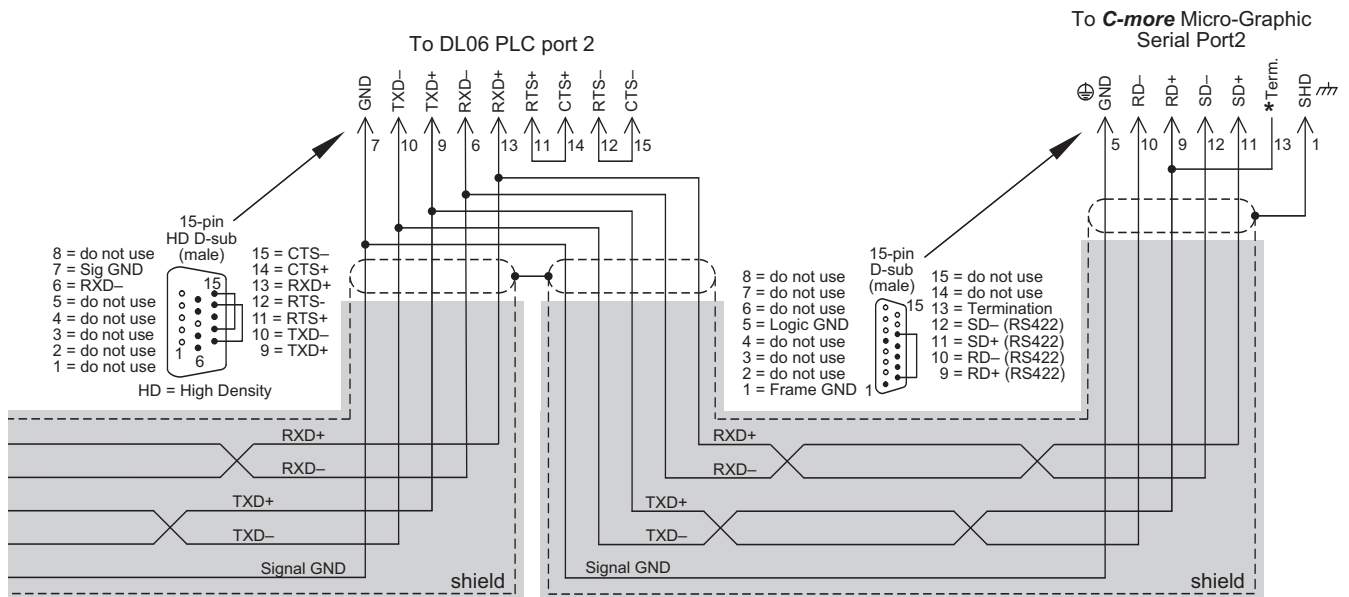
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-422 Multi-Drop Wring Diagram

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



Note: We recommend Belden 8103 shielded cable or equivalent.

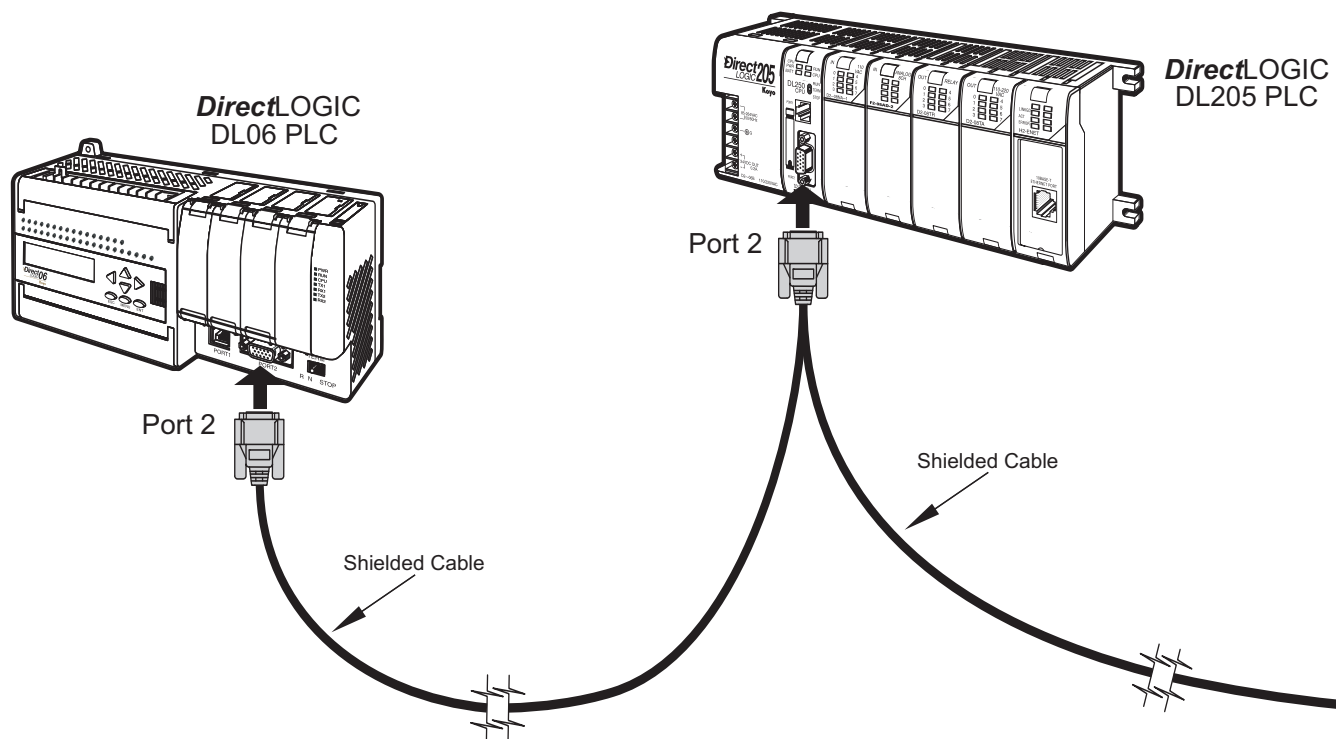


\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more Serial Port2 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

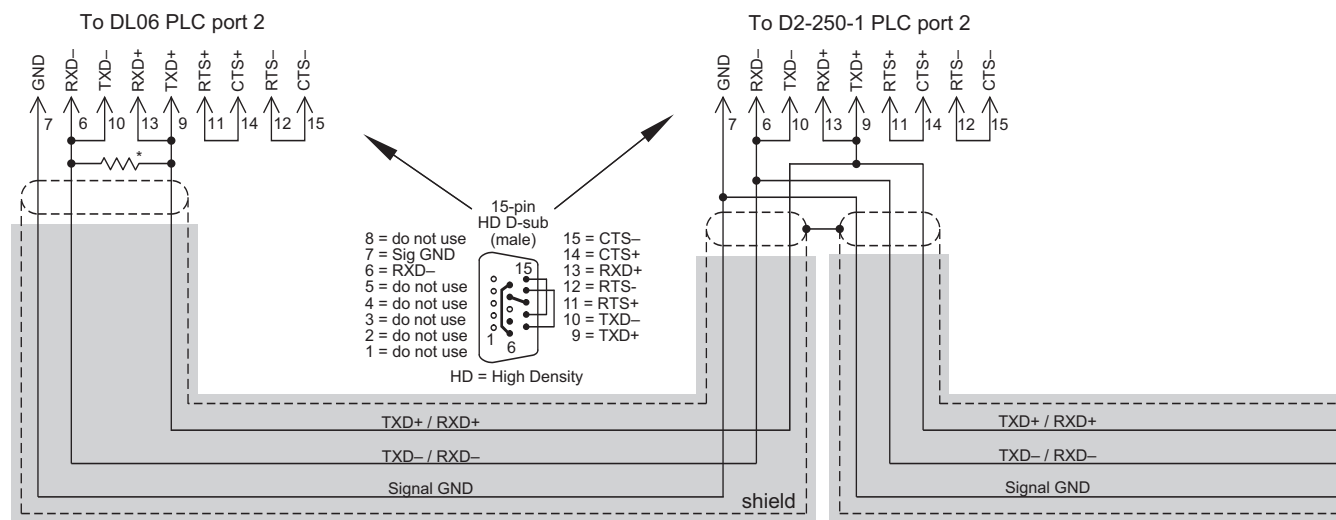
Typical RS-422 Multi-Drop Wiring Diagram (cont'd)

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

6



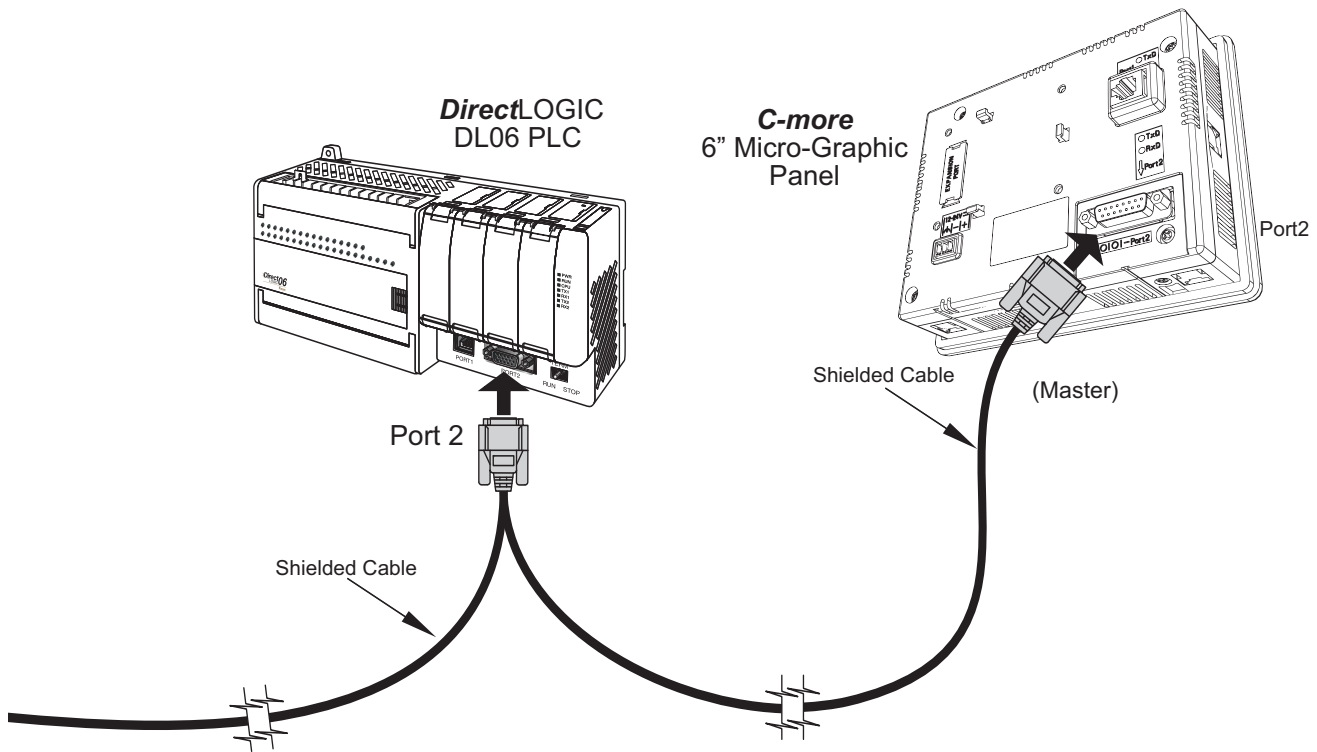
Note: We recommend Belden 88102 shielded cable or equivalent.



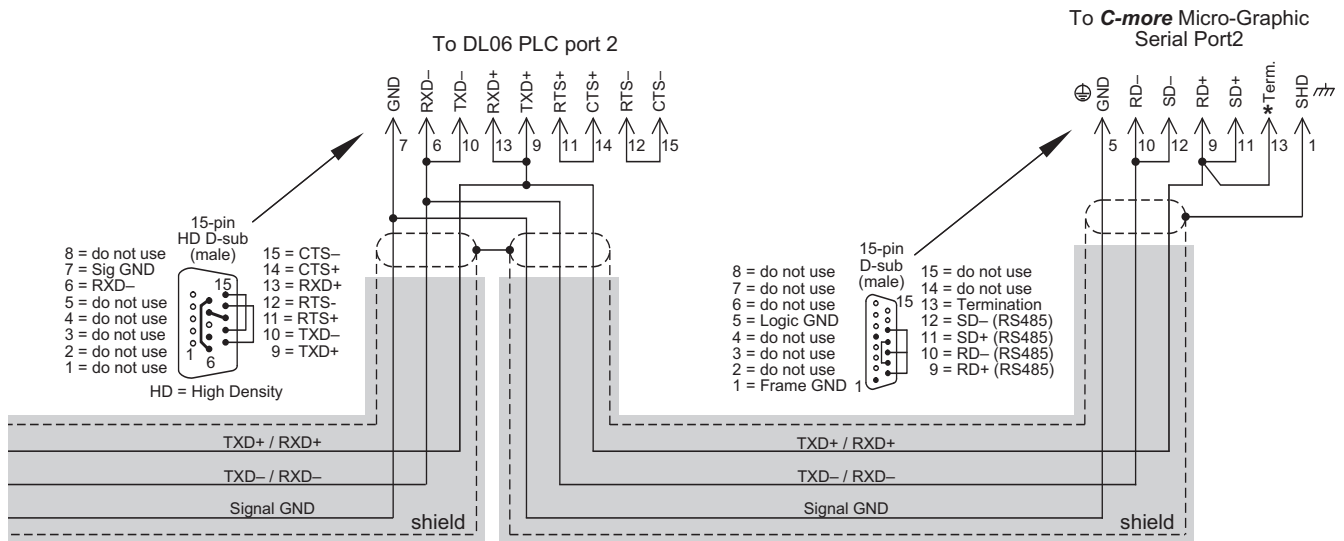
\* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-485 Multi-Drop Wiring Diagram

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



Note: We recommend Belden 88102 shielded cable or equivalent.



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

\* 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 Serial Port2 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.



# MAINTENANCE

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# CHAPTER 7

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Check Transmit and Receive Indicators .....	7-3
Check Physical Conditions .....	7-3
Run Tests under the System Setup Screens .....	7-4
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# Maintenance



Although the *C-more*® 6" Micro-Graphic panels require very little maintenance, setting up a routine maintenance schedule will insure 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 bi-annually.

## Project Backup

During a routine preventive maintenance schedule is a good time to make sure that there is an up-to-date backup of the application project.

## Check Operating Environment

Make sure the *C-more* Micro-Graphic panel is operating in the proper temperature range: (0 to 50 °C (32 to 122 °F)).



Make sure the *C-more* Micro-Graphic panel is operating within the specified humidity range: (5–95% RH, non-condensing).



Make sure the operating environment is free of corrosive vapors and gasses.



## Check Operating Voltage

Check the input voltage that is powering the *C-more* Micro-Graphic panel to make sure it is within the appropriate range.



**5 VDC:** If the panel is being powered with 5 VDC from an AUTOMATIONDIRECT PLC's RJ12 serial communications port to Port 1 on the panel, the acceptable voltage range to the panel is 4.75-5.25 VDC (1.05 W @ 5 VDC (210 mA)).

**24 VDC:** If the panel is being powered from an external power source the acceptable voltage range to the panel is 10.2-26.4 VDC (6.5W @ 24 VDC (630mA)).

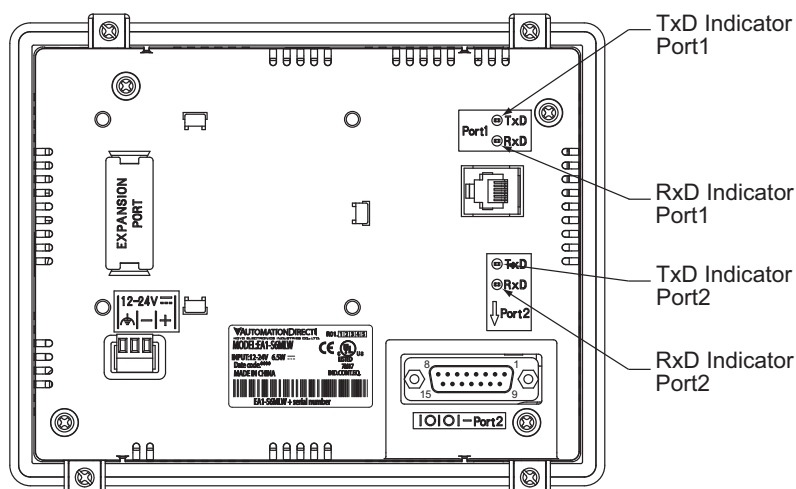


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

## Check Transmit and Receive Indicators

During a routine maintenance check is a good time to take a quick look at the status indicators on the back of the *C-more* 6" Micro-Graphic panel. There should be activity on both the TxD and RxD LED indicators when connected serially to a PLC or control device from either port and data is being updated on the screen.

### C-more 6" Micro-Graphic Panel Communication Ports Status Indicators



## Check Physical Conditions

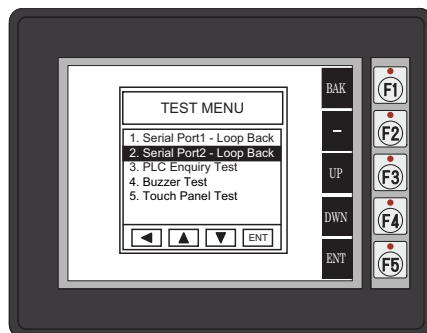
Make sure that harmful chemicals are not being used around the *C-more* 6" Micro-Graphic panel. Look for any deterioration of the panel's bezel and front display area. See **Chapter 2: Specifications** for a chemical compatibility list.

Check the mounting gasket to make sure it is sealing properly and has not deteriorated. Replace the mounting gasket if there are any signs of deterioration, or if there is any evidence that moisture/liquids have penetrated to the inside of the enclosure where the panel is mounted. Information on replacement gaskets can be found in **Chapter 9: Replacement Parts**.

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

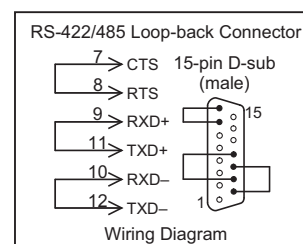
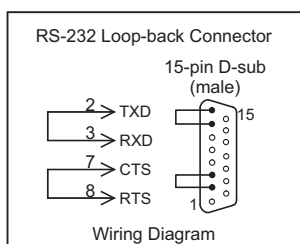
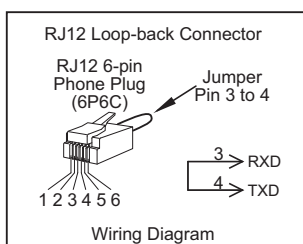
### Run Tests under the System Setup Screens

Use the *C-more* 6" Micro-Graphic panel's System Setup Screens to test communication ports, PLC connectivity, the internal beeper and touch screen operation. See **Chapter 5: System Setup Screens** for additional details.



**Serial Port1** - Performs a test to verify the RJ12 serial communications port (Port 1) on the panel is operating correctly. Requires a loop back connector inserted into the port to properly run the test. A wiring diagram for the loop back connector is shown below.

**Serial Port2** - Performs a test to verify either the RS-232 or the RS485/422 serial communications functionality from the 15-pin connector (Port 2) on the panel is operating correctly. A loop back connector inserted into the port is required for proper testing. Wiring diagrams for RS-232 and RS-485/422 loop back connectors are shown below.



**PLC Enquiry Test** - Tests the communications with the selected PLC protocol between the panel and a connected PLC. Is used with both Port1 and Port2.

**Buzzer Test** - Use this option to test the internal audible beeper of the panel.



**Touch Panel Test** - Tests the response of the touch screen area to contact. This test is used to make sure the touch screen area is responding properly.



**NOTE:** Only one of the ports can be used with a connected PLC. The programming software allows the user to select either Port1 or Port2 under the Panel Manager dialog box. When using Port2 to communicate with the connected PLC, Port1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## Check Settings under the System Setup Screens

Use the *C-more* 6" Micro-Graphic panel's System Setup Screens to check the various settings such as the LCD contrast, background color, beep and orientation. See **Chapter 5: System Setup Screens** for additional details.

**LCD Contrast** - Used to adjust the LCD display's contrast. The default is a value of 3, and the range is 1 to 10, with 10 being the highest contrast. Adjust as necessary.

**Beep** - Used to enable or disable the internal audible beeper. the default is beep on.

**Calibration** - Used to calibrate the touch screen on the panel.

## Cleaning the Display Screen

The display screen should be cleaned periodically by wiping it with a lint free damp cloth using a mild soap solution. Dry the surface when finished with a lint free cloth. Do not use cleaning solvents (ammonia, alcohol, acetone, etc.) which may damage the plastic housing and touch screen.

The longevity of the touch screen can be increased by the use of a **EA-6-COV2** clear screen overlay. See **Chapter 3: Accessories** for additional information on the screen overlay.

To prevent damage to the touch screen, avoid touching the screen with sharp objects, striking the screen with a hard object, using abrasives on the screen, or using excessive force when pressing the touch screen.

### Check Project Functionality

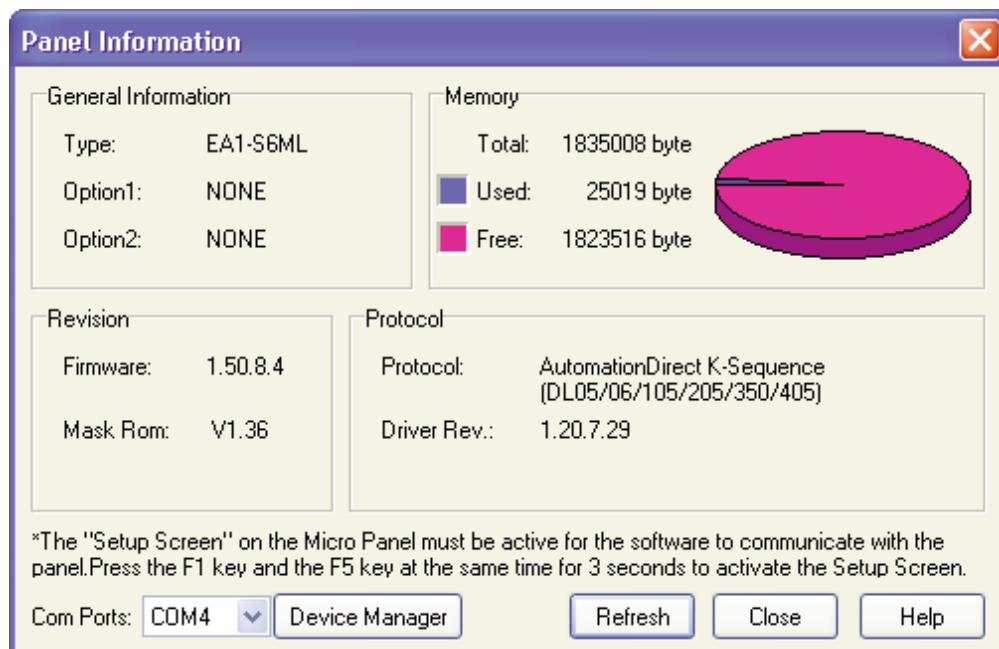
During a routine maintenance schedule is a good time to check the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application. 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 programmed into the *C-more* 6" Micro-Graphic panel application, now is a good time to also check these aids.

### Checks from the *C-more* Micro-Graphic Programming Software

If you have a PC available with the *C-more* Micro-Graphic Programming Software, EA-MG-PGMSW, installed, and the panel is connected to the PC, you can check the status of the panel from the **Panel Information** window.

The **Panel Information** window shown below will indicate the panel type, if a keypad bezel has been installed, the total memory, memory used, free memory, firmware version, mask ROM version, and the PLC protocol selected for its serial communication ports. The programming software can also be used to update the panel's firmware to the latest version.



Notes:

Lined area for notes.



# TROUBLESHOOTING

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# CHAPTER 8

## In This Chapter...

<i>C-more</i> 6" Micro-Graphic Panel does not Power up .....	8-2
Display is Blank .....	8-2
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Lost Firmware – Red 'Update Mode' Screen Displayed .....	8-4
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## Troubleshooting



The following are some problems that may be encountered during the installation and operation of your *C-more*® Micro-Graphic panel. We have made some suggestions on what to check in order to correct the problem.

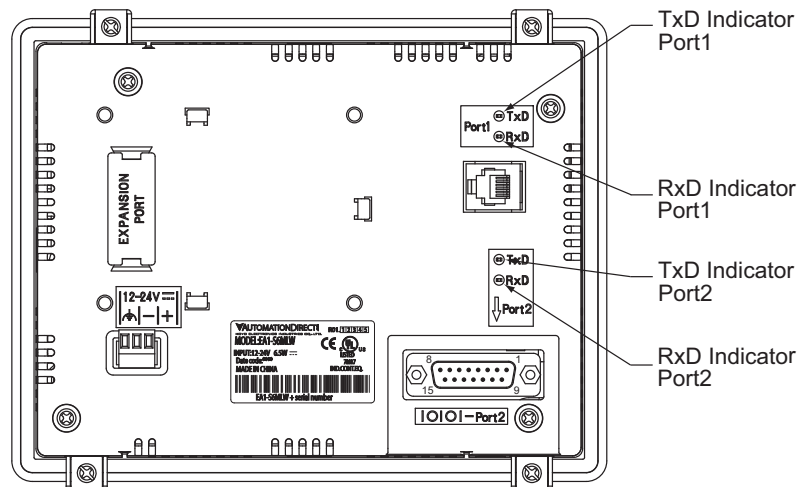
### *C-more* 6" Micro-Graphic Panel does not Power up

**Powered from 5 VDC:** If the panel's display is blank, not responding, and the panel is powered from a 5 VDC power source such as a PC or PLC, check the incoming DC voltage level with a voltmeter. The DC voltage level should be in the range of 4.75 to 5.25 VDC. 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.

**Powered from 12-24 VDC:** If the panel's display is blank, not responding, and the panel is powered from a 12-24 VDC power source, check the incoming DC voltage level to the adapter with a voltmeter. The DC voltage level to the adapter should be in the range of 10.2-26.4 VDC. 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.

### Display is Blank

Also if the panel's display is blank, check the TxD and RxD indicators on the back side of the panel while the panel is communicating with the PLC. The LED indicators should be on or flashing at a fast rate. Indicator activity shows that the panel is communicating with the PLC. If there is communication activity, but the display is still blank, there is the possibility the program in the PLC is controlling the display. Try pressing the F1 and F5 keys simultaneously for 3 seconds. The panel will change to the System Setup Screen menu if the screen is being forced to display a blank screen by the PLC program. Also, check the PLC program, it may have the screen in the off state by placing a 0 in the current screen tag.

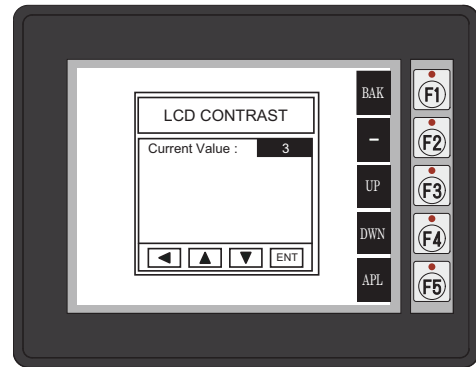
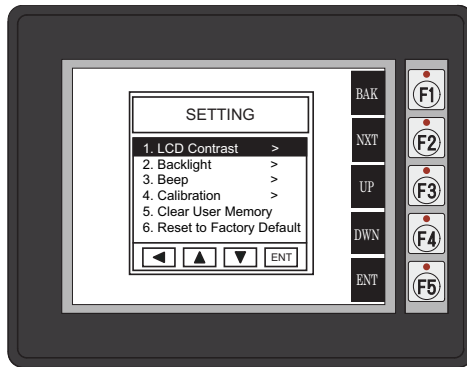


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

## Display is Dim



**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection.

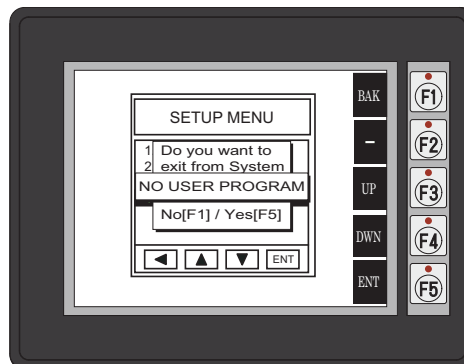


Press the F1 and F5 keys simultaneously for 3 seconds and the panel will bring up the the System Setup Screen menu. Select the Setting menu, and then select item 1; LCD Contrast. The default value is 8. Adjust the current value from 1 to 16 and the panel's contrast should become greater as the value moves toward 16 and it should become less as the value moves toward 1. If this does not happen, then the panel may need to be replaced. See note above.

**LCD Contrast:** The contrast of LCD has 16 levels of adjustment. The default is a value of 8.

## No User Program

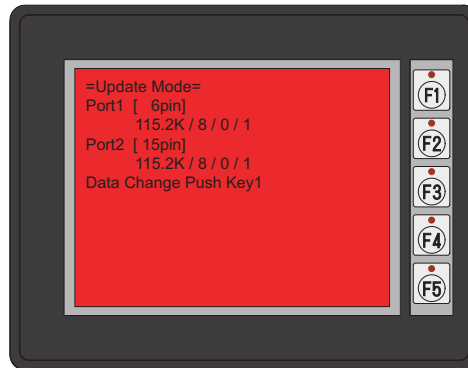
If the panel is displaying the message "No User Program" after it is powered up, then there is no project downloaded into the panel. Using the EA-MG-PGMSW *C-more* Micro-Graphic Programming Software, download your project to the panel.



### Lost Firmware – Red ‘Update Mode’ Screen Displayed

If the *C-more* Micro-Graphic panel's firmware becomes corrupted or for some reason is lost from the panel's memory, the panel will display the **Update Mode** screen as shown below. This can happen if communication between the PC and the panel is interrupted during a firmware update. To resolve the problem, try the following steps in the order shown:

- 1.) Cycle power to the panel.
- 2.) If the problem persists, update the firmware to the panel using the **Update Firmware** utility under the **Panel** pull down menu in the EA-MG-PGMSW Programming Software.
- 3.) If the problem persists, depress function keys F1 and F5 while cycling power to the panel. The panel should come up in the red **Update Mode** screen as shown below. Perform Step 2 again.
- 4.) If there is still a problem, call Tech Support @ 770-844-4200.



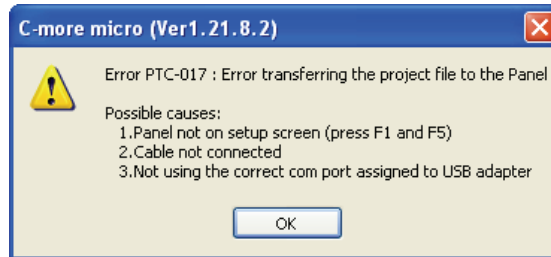
### Updating Firmware

The panel firmware version must match both the programming software version and the version that the program was saved as. If a version needs to be updated, for example, to take advantage of new functionality or product line additions follow these steps:

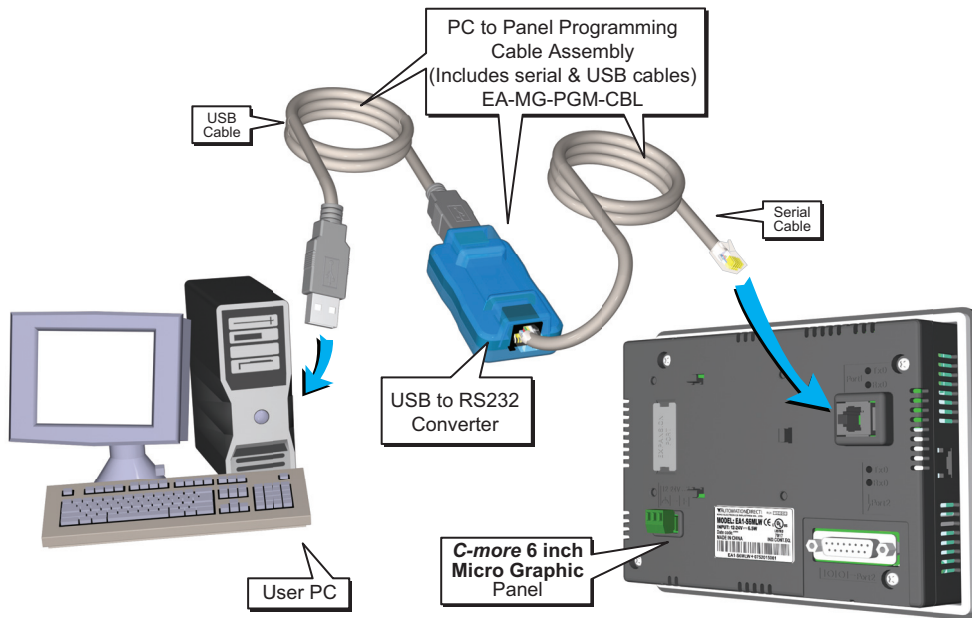
- 1.) Create a backup copy of the project on the PC. From the *C-more* Micro-Graphic programming software, read the project from the panel and save to a desired location.
- 2.) Update the programming software on the PC.
- 3.) Cycle power to the panel.
- 4.) Update the firmware to the panel using the **Update Firmware** utility under the **Panel** pull down menu in the EA-MG-PGMSW Programming Software.
- 5.) Open the project in the updated programming software. Save the project. Transfer the project to the panel.

## No Communications between Panel and PC (Personal Computer)

There are three possible causes that prevent transferring the project to the *C-more* Micro-Graphic panel.



1. **Panel not on setup screen (press F1 and F5)** - Press and hold the F1 and F5 buttons simultaneously for three seconds to enter the setup screen.
2. **Cable not connected** - Double check the programming cable assembly to make sure the panel is correctly connected to the USB port on the PC.

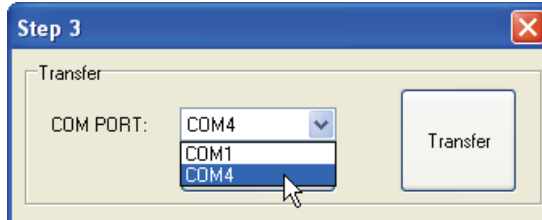


**NOTE:** When properly installed the programming cable will look like a serial communications port to the PC.

No communications between panel and PC continued top of next page.

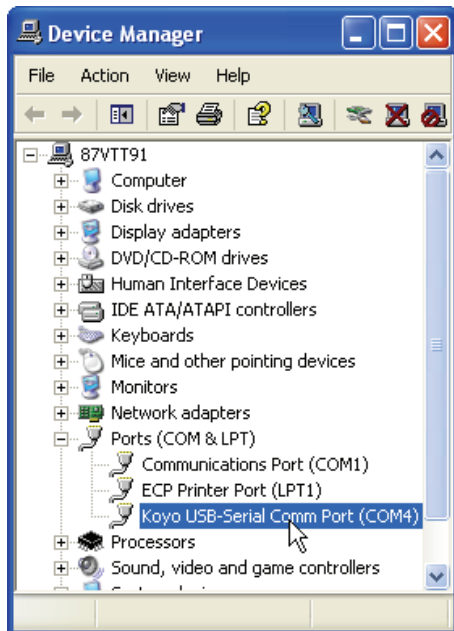
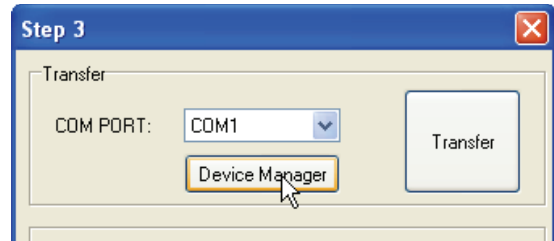
### No Communications between Panel and PC (Personal Computer) (cont'd)

3. Not using the correct COM port assigned to the USB adapter - If the *C-more* Micro-Graphic panel is on the setup screen and the cable connection is correct, then check the PC COM port setting.



If you are unsure which COM port the *C-more* Micro-Graphic programming cable is connected to, click on the **Device Manager** button. This will open Windows ® **Device Manager**.

In the **Device Manager** window, view the active ports by clicking the + button beside the Ports (COM & LPT) menu item. The *C-more* Micro-Graphic panel uses a USB driver called **Koyo** USB-Serial Comm Port.



COM4 is the USB port used in this example. If you cannot find the Koyo USB-Serial Comm Port under Ports (COM & LPT) in **Device Manager**, the USB driver may not be correctly installed or the driver has a problem. Disconnect the cable from the PC and follow these steps to re-install the driver:

- Uninstall the *C-more* Micro-Graphic programming software.
- Unplug the cable between the PC and the *C-more* Micro-Graphic panel.
- Re-install the *C-more* Micro-Graphic programming software. Make sure the install USB driver checkbox is selected.

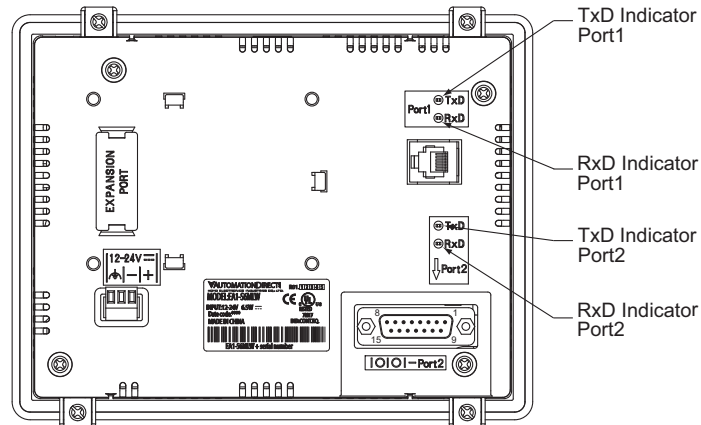
If you have selected the correct COM port and the error still occurs, try connecting the programming cable to a different USB port on the PC and try again.

If the problem persists, call Technical Support at (770) 844-4200, available from 9:00 A.M. to 6:00 P.M. Eastern Time.

## No Communications between Panel and PLC

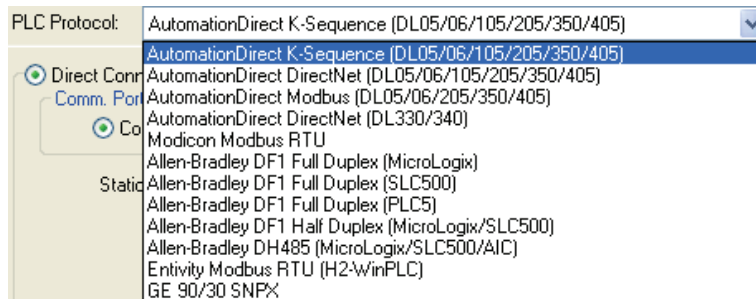
The *C-more* Micro-Graphic panel communicates with a designated PLC or controlling device through the panel's RS-232 RJ12 serial communications port (Port1) or RS-232 / RS-485 / RS-422 communications port (Port2).

Check the TxD and RxD status indicators of the port connected to the PLC. The indicator LED's should be on or flashing at a fast rate. If there is activity on the LED indicators, then the panel and PLC are communicating.



On either serial communications port, if there is no activity on one or both TxD and RxD LED status indicators, then it should be suspected that either:

- The communication settings are incorrect - Open Panel Manager in the C-more Micro-Graphic programming software and verify that the correct panel Comm. Port is selected. Verify that the correct PLC protocol is selected and properly configured.



- The cable is bad and needs to be replaced - Try a proven cable.
- Test panel serial port. See Chapter 5, Serial Port - Loop Back Test. If the panel's serial port is defective and if a cable is available, switch to the other port on the panel. If possible switch the panel with a panel that is communicating properly.
- The serial port on the PLC is defective

Electrical noise, pulse generating wiring and/or improper grounding can also cause problems with communications. Refer to the Electrical Noise Problems section in this chapter for additional help if electrical noise is suspected. Selecting a lower communication rate in Panel Manager may help the panel resist noise.

### Panel & PLC Error Codes

The *C-more* Micro-Graphic panel 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 display any of the errors that the designated PLC generates if there is a problem with the PLC's communications. The PLC generated errors are interpreted by the *C-more* Micro-Graphic programming software and are displayed across the top of the panel's display embedded as a hexadecimal value in error code P499.

If a *C-more* Micro-Graphic communication error does occur, the error message will be displayed in the upper left of the panel's display screen along with the error code number. The error code with error message will blink off and on. .



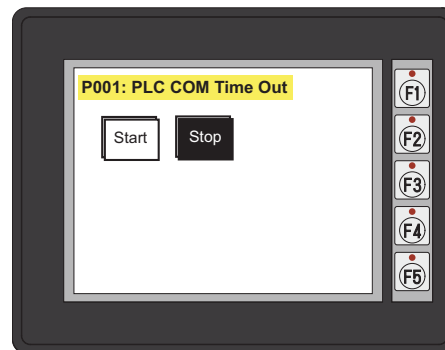
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**NOTE:** See **Appendix A: Panel & PLC Error Code Tables** for a complete list of all error codes.

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## 8

### Panel Communications Error Code Example



### ***C-more* Micro-Graphic Panel Runtime Errors**

The *C-more* Micro-Graphic panel 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 a popup window in the center of the panel’s display. A detailed list and description of the various touch panel runtime errors can be found in **Appendix B: *C-more* Micro-Graphic Panel Runtime Errors**.

#### **Troubleshooting a Panel Runtime Error:**

Follow these steps to troubleshoot a panel runtime error.

1. Check the panel cable connections.
2. Cycle power at the panel.
3. Resend the project.
4. If the error still occurs, reset the panel back to factory default. Refer to Chapter 5 for details



**NOTE:** User memory is cleared when factory defaults are reset. Use the ***C-more*** Micro-Graphic programming software to read the program from the panel and save a backup copy.



### Electrical Noise Problems

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 touch panel.

Electrical noise can enter the system through the power source for the touch panel. Installing a properly wired isolation transformer (neutral grounded) for all AC sources can help the problem, but only if 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, VFOs, etc.

Selecting a lower communication rate in Panel Manager may help the panel resist noise.

# REPLACEMENT PARTS

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Replacement Parts .....	9-2
Customizing the Function Keys Insert Label .....	9-3

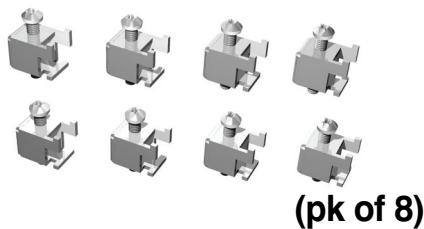
# Replacement Parts Overview

Part Number	Description
EA-MG-BZ2-BRK	Replacement mounting clip for <i>C-more</i> Micro-Graphic panel and keypad bezels (pk of 8)
EA-MG-DC-CON	Replacement adapter DC power connector (pk of 5)
EA-MG6-S6ML-GSK	Replacement mounting gasket for <i>C-more</i> 6" Micro-Graphic panels
EA-MG6-BZ2-GSK	Replacement mounting gasket for <i>C-more</i> 6" Micro-Graphic keypad bezels EA-MG-BZ2(P)
EA-MG-S6ML-FKL	Replacement function key label insert for <i>C-more</i> Micro-Graphic panels (pk of 5; 3 blank, 1 F1-F5 for landscape, 1 F1-F5 for portrait)
EA-6-COV2	Clear Screen Overlay (pk of 3)

## Replacement Parts

Mounting Clips for 6" panel or bezel

Part No. EA-MG-BZ2-BRK



(pk of 8)

DC Power Connector  
Part No. EA-MG-DC-CON

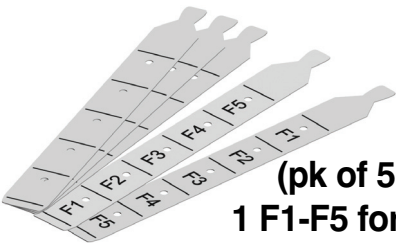


(pk of 5)

Panel Gasket  
Part No. EA-MG6-S6ML-GSK



Function Keys Label Inserts  
Part No. EA-MG6-S6ML-FKL

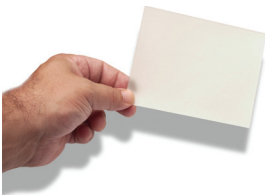


(pk of 5; 3 blank,  
1 F1-F5 for landscape,  
1 F1-F5 for portrait)

Keypad Bezel Gasket  
Part No. EA-MG6-BZ2-GSK



Clear Screen Overlay  
EA-6-COV2



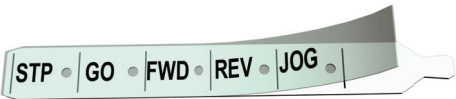
(pk of 3)

# Customizing the Function Keys Insert Label

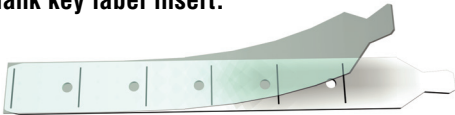
Step 1 - Remove existing function key label insert using a small tool such as jeweler's screw driver.



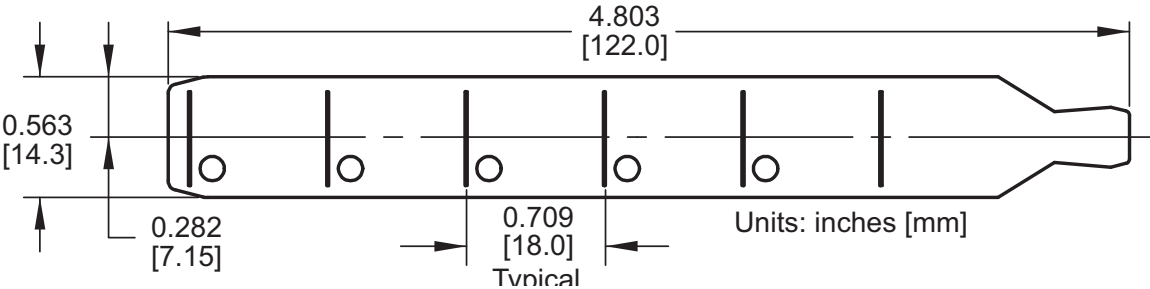
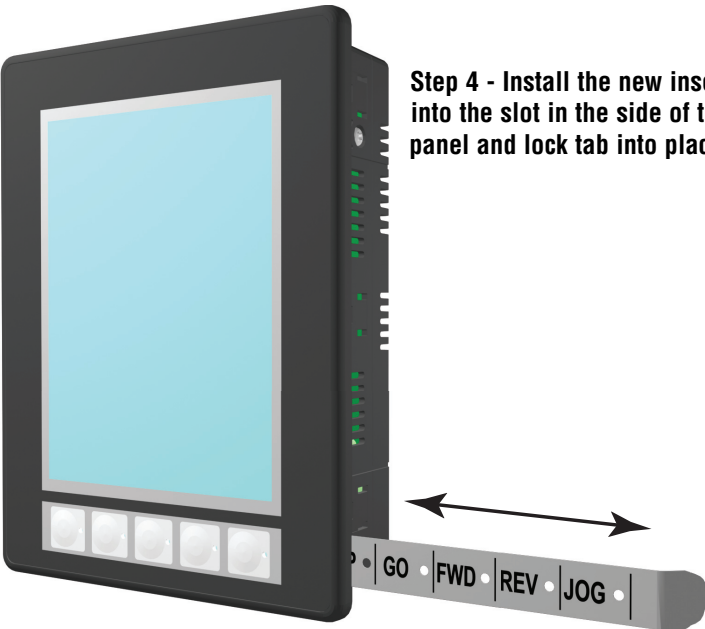
Step 3 - If desired, print and apply self adhesive labels to the blank insert.



Step 2 - Remove the protective film from the blank key label insert.



Step 4 - Install the new insert into the slot in the side of the panel and lock tab into place.



# PANEL & PLC ERROR CODE TABLES

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Introduction

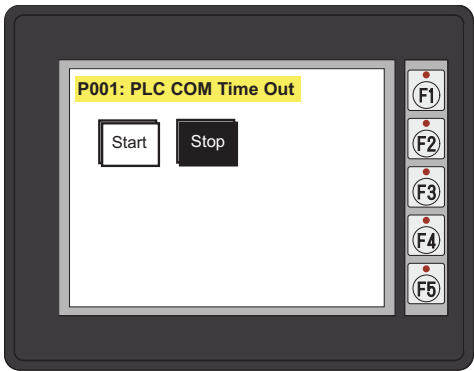
The *C-more*<sup>®</sup> Micro-Graphic panels are capable of communicating over RS232, RS422 and RS485 serial networks. They communicate with all controllers in the *Direct*LOGIC family of PLCs utilizing various protocols, and certain 3rd party PLCs. For a complete list of the supported PLCs and protocols, see the PLC Drivers table in **Chapter 6: PLC Communications**.

As with any network communications, errors may occur. To simplify identification of the possible cause of the error, we have provided tables listing these errors. If a *C-more* Micro-Graphic panel communications error, or other related data exchange error does occur, the error message will appear across the top of the display screen as shown in the example below. A complete table of the panel generated errors, with their respective error codes, error messages, and the possible causes of the error follows.

The *C-more* Micro-Graphic panel also monitors any errors that are generated by the PLC that is 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. An explanation of how the specific PLC error is identified in the panel error code P499 is shown preceeding the specific manufacturer's PLC error tables. How the hexadecimal error code value is interpreted is slightly different between manufacturers, so it is important to check the explanation at the beginning of each manufacturer's tables. Since these errors are generated by the PLC, refer to the PLC manufacturers documentation for further explanation.

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

C-more Micro-Graphic Panel Error Example



## C-more Micro-Graphic Panel 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.

<i>C-more</i> Micro-Graphic Panel Error Table		
Error Code	Error Message	Cause
P001	PLC Com Time Out	A timeout occurred after sending a request to the PLC.
P002	NAK Received	A negative acknowledgement (NAK) control code has been generated during a read/write request.
P003	EOT Received	An end of transmission has been sent by PLC in response to a read/write/setbit request.
P004	STX is Not Found	A Start of Text (STX) control code was not found in the data packet received from the PLC.
P005	ETX/ETB 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.
P006	LRC 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.
P007	CRC 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.
P008	Address Not Match	The address value returned in the data packet from the PLC is incorrect.
P009	Re.INV.FUN.Code	The function code returned in the data packet from the PLC is incorrect.
P010	DataSizeNotMatch	There are an incorrect number of bytes found in the data packet returned from the PLC.
P011	INV.Val.FUN.Code	There is an invalid value in the function code.
P012	INVALID COMMAND	There was an invalid command sent to the PLC that wasn't recognized by the PLC.
P013	ENQ Received	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.
P014	TransID Not Match	This error will be displayed if after checking the Transaction ID Byte in the data packet, there is no match to what was requested.
P015	Device Not Found	A PLC device designated as Device could not be found.
P016	DataByte Com.Err	The data part of the packet received contains 0 bytes of data.
P017	Out of Add.Range	The touch panel requested a file number larger than 255.
P019	Parity Error	Parity error occurred.
P021	PLC# Not Match	PLC Number does not match
P023	Not Connected	Cable not connected properly
P024	No Other Dev.	Cannot detect other devices
P025	PollingListErr.	Panel not in polling list
P028	No Response	PLC failed to Respond: %PLC Node#%??

*C-more* Micro-Graphic Panel Error Code Table continued on the next page.

## C-more Micro-Graphic Panel Error Code Table (cont'd)

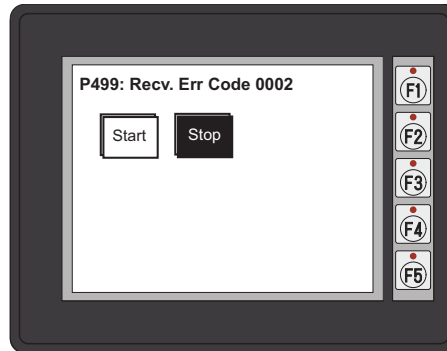
C-more Micro-Graphic Panel Error Table (cont'd)		
Error Code	Error Message	Cause
P499*	ErrCode Received -> Recv .Err Code XXXX	A PLC generated error code with a hexadecimal value of XXXX has been returned from the PLC. * See the explanation for error code P499 proceeding each set of PLC error code tables.
P500	Can'tWriteS.Port	Data cannot be written 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.
P700	RD.Buff.MEM Full	There was an error while allocating memory for the read buffer. When this error is displayed, a memory leak may have occurred.
P701	INV.PLC Address	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.
P702	INV.FUN.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.
P703	WRT.PLC.ReadOnly	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.



## DirectLOGIC Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 error message includes a four digit hexadecimal value displayed at the end of the message. This value can be found in the specific PLC's error tables to determine the cause of the error. The possible PLC generated error codes for the various *Direct LOGIC* communication protocols breakdown into a four digit hexadecimal value.

### *Direct*LOGIC PLC Error Code Displayed Example:



## DirectLOGIC – K-Sequence 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.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for <i>Direct</i> LOGIC – K-Sequence	
Panel Error Code P499 Hex Value	Description
01F8	Error setting value.
020D	Error in key mode.
021C	Password protected.

### DirectLOGIC – DirectNET PLC Error Codes

There are no PLC generated errors that occur when using the *DirectNET* protocol.

### DirectLOGIC – Modbus (Koyo) PLC Error Code Table

The following table lists the errors that can be generated by the *DirectLOGIC* PLC when using the Modbus (Koyo) protocol.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for <i>DirectLOGIC</i> – Modbus (Koyo)	
Panel Error Code P499 Hex Value	Description
0x1	The function code is unknown by the server.
0x2	Dependent upon the request.
0x3	Illegal data value dependent upon the request.
0x4	The server failed during the execution.

### Modbus RTU PLC Error Code Table

The following table lists the errors that can be generated by the *DirectLOGIC* PLC when using the Modbus RTU protocol.

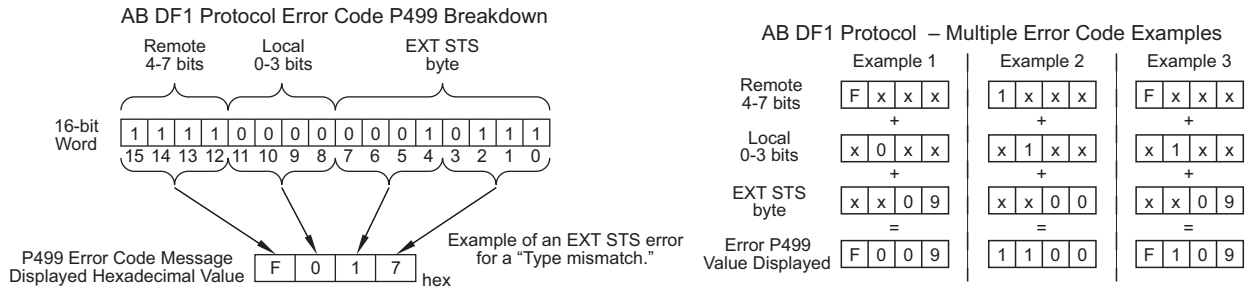


**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Modbus RTU	
Panel Error Code P499 Hex Value	Description
0x1	The function code is unknown to the server.
0x2	Dependent upon the request.
0x3	Illegal data value dependent upon the request.
0x4	The server failed during the execution.

## Allen-Bradley Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 Allen-Bradley DF1 and DH485 communication protocol is 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.



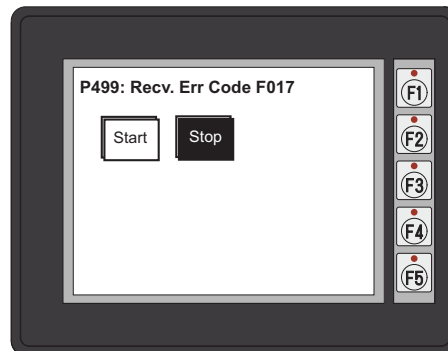
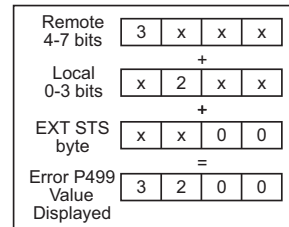
## Allen-Bradley PLC Error Code Displayed Example

### Error Received = P499: Recv. Err Code 3200

Remote = 0x3000 = Remote node host is missing, disconnected or shut down.

Local - 0x0200 = Cannot Guarantee Delivery; Link Layer. The remote node specified does not ACK Command

EXT STS = 0000 = None



## Allen-Bradley DF1 Protocol – PLC Error Code Tables

The following PLC error tables cover possible errors that are detected by the panel from Allen-Bradley PLCs using the DF1 protocol. This includes full and half duplex communications for the MicroLogix 1000, 1100, 1200 & 1500, SLC 5/03, /04, /05, ControlLogix, CompactLogix and FlexLogix, and full duplex communications for the PLC5.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Errors for Allen-Bradley DF1 Protocol, Remote STS Errors (4-7 bits)	
Panel Error Code P499 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 Errors for Allen-Bradley DF1 Protocol, Local STS Errors (0-3 bits)	
Panel Error Code P499 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 generated error codes for the Allen-Bradley DF1 Protocol continued on the next page.)

# Allen-Bradley DF1 Protocol – PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley DF1 Protocol, EXT STS Command Code for F0 Command	
Panel Error Code P499 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	Reserved
0x1D	Reserved
0x1E	Data table element protection violation.
0x1F	Temporary internal problem.

## Allen-Bradley DH485 Protocol – 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 DH485 protocol. This includes all MicroLogix and SLC500 PLCs, 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** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Errors for Allen-Bradley DH485 Protocol, Local STS Errors (0-3 bits)	
Panel Error Code P499 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 DH485 Protocol, Remote STS Errors (4-7 bits)	
Panel Error Code P499 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 DH485 protocol continued on the next page.)

## Allen-Bradley DH485 Protocol – PLC Error Code Tables (cont'd)

A

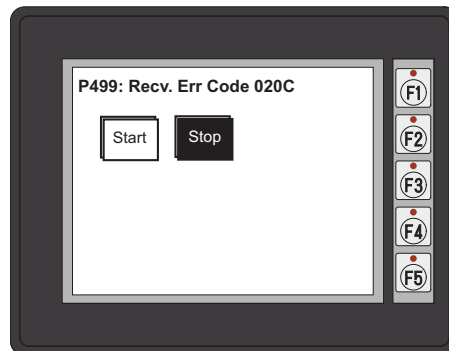
PLC Errors for Allen-Bradley DH485 Protocol, EXT STS Command Code for F0 Command	
Panel Error Code P499 Hex Value	Description
0x7	Insufficient memory module size (0000h is returned).
0xB	Access denied; privilege violation.
0xC	Resource not available or cannot do.
0xE	CMD cannot be executed.
0x12	Invalid parameter.
0x14	Failure during processing.
0x19	Duplicate label.
0x1A	File open by another node + owner's local node address, 1 byte.
0x1B	Program owned by another node + program owner's local node address, 1 byte.

### A

## GE Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 GE 90-30, 90-70, Micro 90 and VersaMax Micro SNPX communication protocols breakdown into a four digit hexadecimal value.

### GE Error Code P499 Message Example:





## GE SNPX Protocol – PLC Error Code Tables

The following table lists the errors that can be generated by the GE 90-30, 90-70 and VersaMax PLC when using the SNPX protocol.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more Micro-Graphic** panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Errors for GE SNPX Protocol (Major)	
Panel Error Code P499 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 successfully 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 used 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 NAKed the maximum number of two times. The NAKed message may be retransmitted a maximum of two times.

(PLC generated error codes for the GE 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)



## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 CMM module 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)



## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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.

A

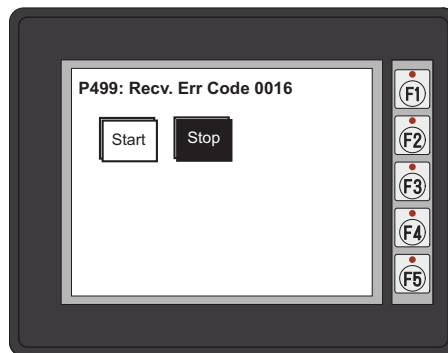
## Mitsubishi FX Protocol – PLC Error Codes

Only errors as listed in the Micro-Graphic Panel Error Code Table shown on page A-3 can occur when using the Mitsubishi FX protocol, there are no PLC generated errors.

## Omron Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 Omron Host Link communication protocols breakdown into a four digit hexadecimal value.

### Omron Error Code P499 Message Example:



## 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** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Omron Host Link	
Panel Error Code P499 Hex Value	Description
0x00	Normal Completion.
0x01	Not executable in RUN mode.
0x02	Not executable in MONITOR mode.
0x03	Not executable with PROM mounted.
0x04	Address over (data overflow).
0x0B	Not executable in PROGRAM mode.
0x0C	Not executable in DEBUG mode.
0x0D	Not executable in LOCAL mode.
0x10	Parity error.
0x11	Framing error.
0x12	Overrun.
0x13	FCS error.
0x14	Format error (parameter length error).
0x15	Entry number data error (parameter error, data code error, data length error).
0x16	Instruction not found.
0x18	Frame length error.
0x19	Not executable (due to Un-executable error clear, non-registration of I/O table, etc.).
0x20	I/O table generation impossible (unrecognized remote I/O unit, channel over, duplication of optical transmitting I/O unit).
0xA0	Abort due to parity error in transmit data under process.
0xA1	Abort due to framing error in transmit data under process.
0xA2	Abort due to overrun in transmit data under process.
0xA3	Abort due to FCS error in transmit data under process.
0xA4	Abort due to format error in transmit data under process.
0xA5	Abort due to frame length error in transmit data under process.
0xA8	Abort due to entry number data error in transmit data under process.
0xB0	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** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Omron FINS	
Panel Error Code P499 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.)

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

PLC Error Codes for Omron FINS	
Panel Error Code P499 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.

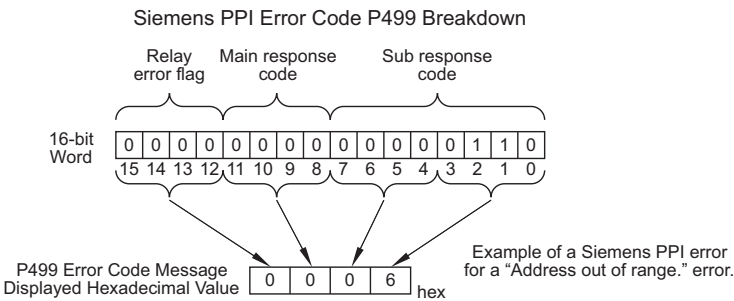
(PLC generated error codes for the Omron FINS protocol continued on the next page.)

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

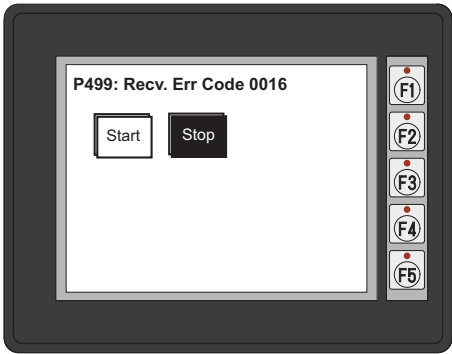
PLC Error Codes for Omron FINS	
Panel Error Code P499 Hex Value	Description
0x2507	Unit Error: I/O bus error.
0x2509	Unit Error: SYSMAC BUS/2 error.
0x250A	Unit Error: CPU Bus Unit Error.
0x250D	Unit Error: SYSMAC BUS No. duplication.
0x250F	Unit Error: Memory Error.
0x2510	Unit Error: SYSMAC BUS terminator 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.

# Siemens Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 diagram.



## Siemens Error Code P499 Message Example:



## Siemens PPI Protocol – PLC Error Code Table

PLC PDU Header Errors for S7-200 PPI	
Panel Error Code P499 Hex Value	Description
0x0001	Hardware Fault.
0x0003	Object access not allowed.
0x0004	Context not supported.
0x0005	Address out of range.
0x0006	Address out of range.
0x0007	Write Data size mismatch.
0x000A	Object 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.





# ***C-MORE* MICRO-GRAPHIC PANEL RUNTIME ERRORS**

---



## **APPENDIX B**

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Runtime Errors .....	B-2

### Introduction

The runtime errors detected by the *C-more*® Micro-Graphic panel will display in a popup window in the center of the panel display. The most common cause for runtime errors is a bad serial connection during a project transfer or firmware update. To resolve the problem, try the following steps in the order shown:

1. Check that all connections are secure and cables are in good condition.
2. Cycle power to the panel.
3. Reset factory default system settings.
4. Transfer the project again.

### Panel Errors

If more than one panel error occurs, each error message will display sequentially for three seconds with a two second delay between each message.

When only one panel error is active, that message will display continuously until it is no longer active.

Micro-Graphic Panel Errors		
Error Code	Error Message	Possible Solutions
R001	PC software tool Timeout	Check cables and connections. Cycle power at the panel.
R002	CRC Error occurred during project transfer from PC.	See Chapter 8 for Electrical Noise Problems. Check the area for sources of noise: electrical motors, transformers, etc. Check for proper grounding Resend the project.
R003	Project Check Sum Error. Resend Project file to Panel.	Cycle power. Resend the project.
R004	Protocol Module Check Sum Error. Resend Project File to Panel	
R005	Panel Check Sum Error. Panel Info (Not Project) will be initialized.	From the Setup Menu screen, reset panel options.
R006	SW Ver. Mismatch. Use software Ver.xx.xx.	Update to current version programming software and panel firmware.
R100	Option module detected without external power	EA-MG-SP1 or EA-MG-P1 optional power adapter module is installed on a C-more 3" Micro-Graphic panel without a 12-24 VDC power source. Provide 12-24 VDC power to the optional module.
R101	Unsupported module detected	EA-MG-SP1 or EA-MG-P1 optional power adapter module for a C-more 3" Micro-Graphic panel is installed on a C-more 6" Micro-Graphic panel. Remove the EA-MG-SP1 or EA-MG-P1.

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**Micro-Graphic  
Panel**



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**Micro-Graphic Panel Installed in a  
20-button Keypad Bezel EA-MG-BZ2  
showing touch function.**





# Graphic Panel

## 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	09/06	Original issue
Rev. A	04/07	Minor corrections made and content added for AB protocol
Rev. B	05/07	Minor revisions & removal of all references to PLC Driver for Entivity Modbus RTU.
Rev. C	08/07	Added PLC Protocol for Entivity Modbus RTU, GE, Mitsubishi, Omron & Modicon.
2nd Edition	03/08	Added "white" backlight color models EA1-S3MLW and EA1-S3MLW-N. Also added PLC protocols for Allen-Bradley DH485, GE VersaMax & Siemens PPI.

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# GETTING STARTED

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## Introduction

### The Purpose of this Manual

Thank you for purchasing our *C-more*™ Micro-Graphic family of products. This manual describes *AutomationDirect.com's* *C-more* Micro-Graphic panels, their specifications, included components, available accessories and provides you with important information for installation, connectivity and setup. The manual shows you how to install, wire and use the products. It also helps you understand how to interface the panels to other devices in a control system.

This user manual contains important information for personnel who will install the panels and accessories, and for the personnel who will be programming the panel. If you understand control systems making use of operating interfaces such as the *C-more* Micro-Graphic panels, 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 aid of the Quick Start Guide that is included with each panel and accessory. You may also have need to refer to the On-line help that is available in the *C-more* Micro-Graphic programming software. The Quick Start Guide is included with each accessory that will help with installing the accessory.

### Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. If you cannot find the solution to your particular application, or, if for any reason you need technical assistance, please call us at:

**770-844-4200**

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company.

**<http://www.automationdirect.com>**

If you have a comment, question or suggestion about any of our products, services, or manuals, please fill out and return the 'Suggestions' card that was included with this manual.

# 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:** in boldface 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.

Getting Started

CHAPTER 1

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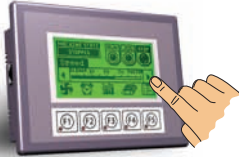
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# Product Overview

1

Touch  
Screen



Non  
Touch



### **EA1-S3ML, EA1-S3MLW\***

### **EA1-S3ML-N, EA1-S3MLW-N\***

*C-more* Micro-Graphic 3.1-inch Panels have an STN LCD, 128 x 64 dot monochrome display. Models EA1-S3ML and EA1-S3ML-N have 5 selectable backlight colors (green, red, amber, yellow and lime). Models EA1-S3MLW and EA1-S3MLW-N have 5 selectable backlight colors (white, pink1, pink2, pink3 and red). The panels have 5 user-defined functions keys with LED indicators. The panels can display up to 10 lines by 32 characters of static text and up to 10 lines by 21 characters of dynamic text with embedded variables and phrases mixed with graphics. Power is supplied to the panel through the serial communication port connection when used with most *DirectLOGIC* PLC's having a RJ12 communication port. Either EA-MG-SP1 (power supply with serial port option module) or EA-MG-P1 is required when connecting to third party PLC's. NEMA 4/4X, IP-65 rated (when mounted correctly). For indoor use only.

Other features include:

- 768 KB memory
- Built in RJ12 serial communications port
- Adjustable contrast
- 2 optional keypad bezels, 8-button or 20-button
- 2 optional DC Power Adapters, one includes 15-pin serial communications port (RS-232/422/485)
- Optional replaceable clear screen overlay
- Built in Alarm Control setup that activates beep, backlight flash, customized alarm banner, and red LED blinking
- Up to 999 screens, limited only by memory usage
- 0 to 50 °C (32 to 122 °F) operating temperature range
- UL, cUL & CE agency approvals (see below for details)
- 2-year warranty from date of purchase



**\*Note:** *C-more* Micro-Graphic panels with the letter "W" in the part number designate units with five selectable background colors of White, Pink1, Pink2, Pink3 and Red. Part numbers without the letter "W" are provided with five selectable background colors of Green, Red, Amber, Yellow and Lime.



**\*Note:** Software and Firmware Version 1.5 or later is required with models EA1-S3MLW and EA1-S3MLW-N. Available for free download at [www.automationdirect.com](http://www.automationdirect.com)

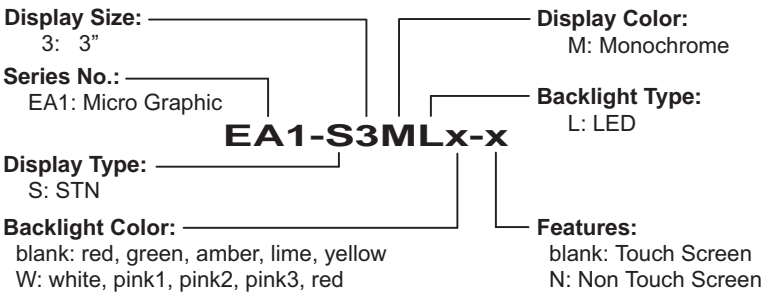
# Agency Approvals

UL/CUL/CE Certification Numbers				
Name	UL/CUL	UL508	CE	ISO-9000
C-more Micro-Graphic Panels & Accessories	E157382	E157382	EN61131-2	Yes



# Part Number Key

The *C-more* Micro-Graphic panel part numbers use the following key:



## Product Label Examples:

**EA1-S3ML**  
**EA1-S3MLW**



**EA1-S3ML-N**  
**EA1-S3MLW-N**



## Serial Number and Date Code formats:

Serial Number = [Part Number]+[YYMDDFNNN]

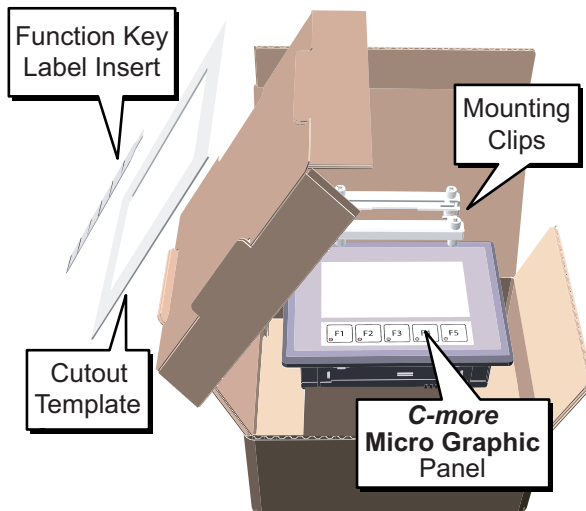
Date Code = **YYMF**

**YY:** Year (07–99 --- e.g. 07 = 2007)  
**M:** Month (1–9, X, Y, Z --- e.g. X = Oct.)  
**DD:** Day (1–31)  
**F:** Manufacturing Site (0–9, A–Z)  
**NNN:** Sequence number for the date listed (000–999)

## Quick Start Steps

### Step 1 – Unpack and Inspect

- a.) Unpack the *C-more* Micro-Graphic panel from its shipping carton. Included in the carton are the following:
- *C-more* Micro-Graphic panel
  - cutout template
  - mounting clips (EA-MG-S3ML-BRK)
  - gasket (EA-MG-S3ML-GSK)
  - blank function key label insert (EA-MG-S3ML-FKL)
  - Quick Start Guide (EA1-MG-QSG)



**Shipping Carton Contents**

- b.) Unpack any accessories that have been ordered, such as: Keypad Bezel, DC Power Adapter, 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**

**8-Button Keypad Bezel  
EA-MG-BZ1**

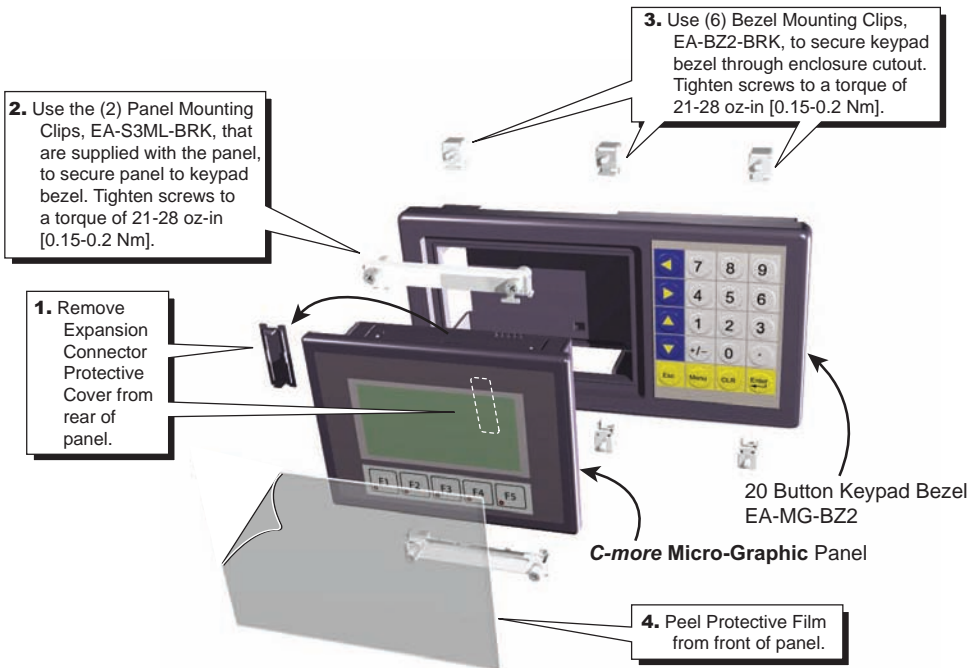


**20-Button Keypad Bezel  
EA-MG-BZ2**



### Step 2 – Install Optional Hardware Accessories

Below is an example of a *C-more* Micro-Graphic panel being assembled with an optional EA-MG-BZ2 20-button Keypad Bezel. See the Quick Start Guide, EA1-MG-QSG, for additional assembly instructions and illustrations.



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

### Optional Accessories

**DC Power Adapter  
EA-MG-P1**



**Serial Port w/ DC Power Adapter  
EA-MG-SP1**

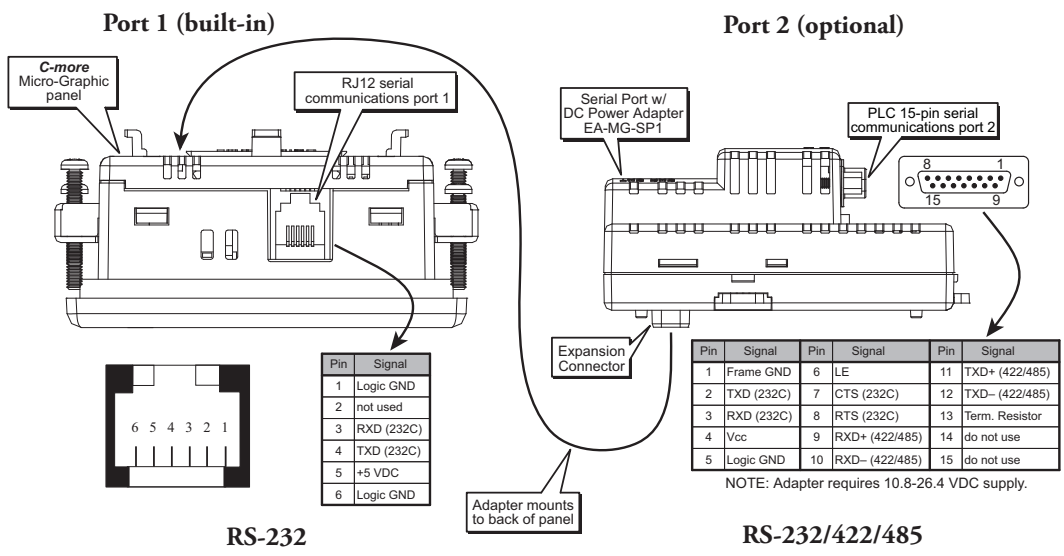


**Clear Screen Overlay  
EA-MG-COV-CL**



Step 3 – Become Familiar with Available Communication Ports

The *C-more* Micro-Graphic panel includes a built-in RS-232 serial communications port designated as Port 1. This port uses an RJ12 type telephone jack to make connections to either the EA-MG-PGM-CBL programming cable assembly or a communications cable, such as an EA-2CBL, to interface with a PLC or controller. The panel can receive power through this port from the serial communications port on selected *DirectLOGIC* PLCs. The other serial communications port designated as Port 2 is available by installing the optional EA-MG-SP1 DC Power Adapter with Serial Port onto the rear of the panel, or if using an optional keypad bezel, install onto the rear of the bezel with the panel installed through the front of the bezel. Port 2 supports RS-232, RS-485 and RS-422.



**NOTE:** See Chapter 2: Specifications and Chapter 6: PLC Communications for additional details on the available communication ports, protocols and cables.



**NOTE:** The panel has one built-in RJ12 serial communications port (Port1 - RS-232) and the option to add one 15-pin serial communications port (Port2 - RS-232/422/485) to the panel by installing the EA-MG-SP1 module. **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.



**NOTE:** If the DC power adapter is installed on the panel, the adapter must be powered.

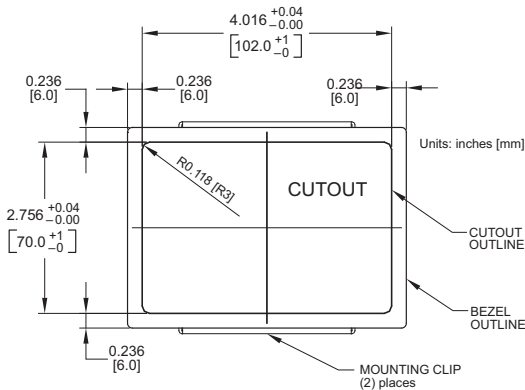
## Step 4 – Install Micro-Graphic Panel

The *C-more* Micro-Graphic panel can be mounted through a cutout in an enclosure by using the template that is provided with the panel, or using the dimensions shown below. Cutout dimensions for the 8-button and 20-button keypad bezel options are also shown below. The keypad bezels also include a template that can be used. The enclosure mounting thickness range for the panels and the keypad bezels is 0.04”–0.2” [1–5 mm].

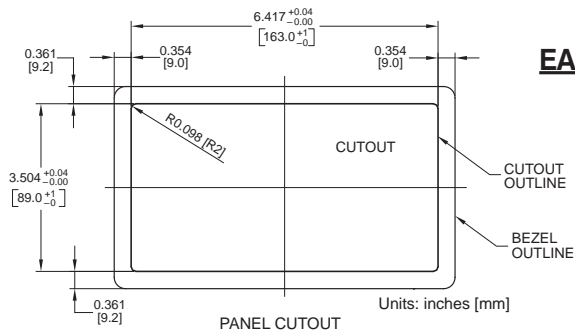
The screw torque range for the screws used on the panel mounting clips and the keypad bezel mounting clips is 21–28 oz-in [0.15–0.2 Nm].

See Chapter 2: Specifications for additional product dimensions.

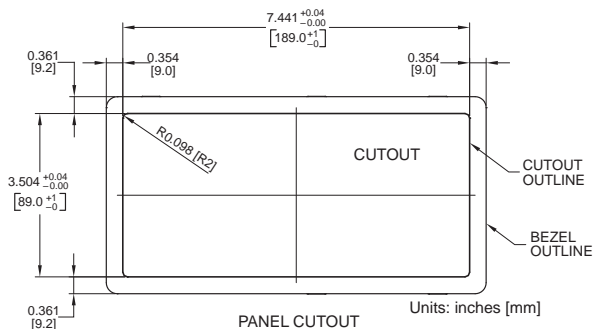
### Port 1 (built-in)



### EA-MG-BZ1 Keypad Bezel Cutout



### EA-MG-BZ2 Keypad Bezel Cutout



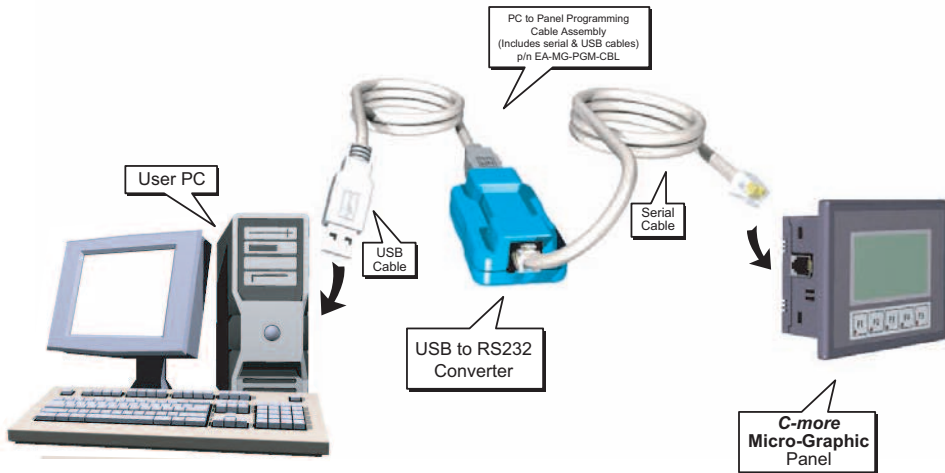
**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

## Step 5 – Connect Micro-Graphic Panel to Computer

Use an EA-MG-PGM-CBL, USB to RS-232 Programming Cable Assembly, from an USB port type A on the project development PC, through the supplied converter, to the RJ12 RS-232 programming/PLC serial communications port on the *C-more* Micro-Graphic panel as shown below.

1

### USB to RS-232 Programming Cable Assembly

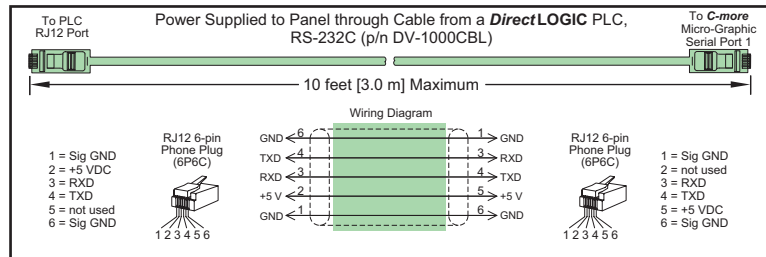




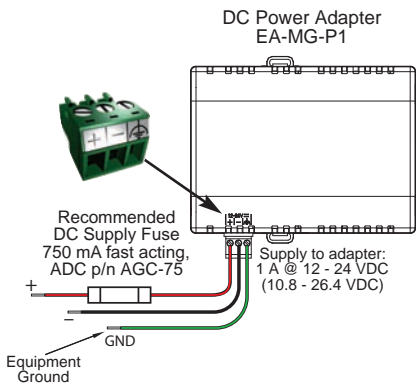
## Step 6 – Provide Power to the Micro-Graphic Panel

- The *C-more* Micro-Graphic panel is powered during programming from the PC through the USB to RS-232 Programming Cable Assembly, EA-MG-PGM-CBL.
- During operation, the *C-more* Micro-Graphic panel can be powered from most *AutomationDirect* *DirectLOGIC* PLC's RJ12 serial communications port by using a DV-1000CBL communications cable, or a DV-1000CBL communications cable with a FA-15HD 15-pin HD DSub/RJ12 Adapter connected to a *DirectLOGIC* PLC's 15-pin HD communications port (DL06, D2-250-1 & D2-260) PLCs. See **Chapter 6: PLC Communications** for additional details.
- The panel can also be powered by installing either the EA-MG-P1 DC Power Adapter, or the EA-MG-SP1 Serial Port with DC Power Adapter to the back of the panel and supply the adapter from a 1 Amp @ 12-24 VDC power source.

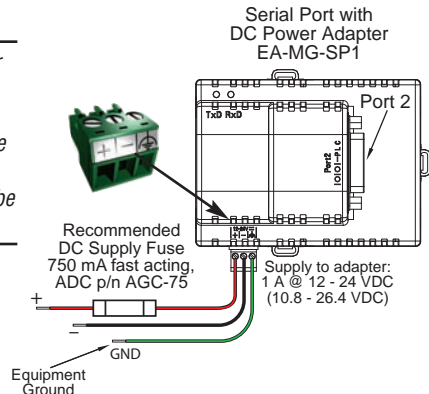
### Panel Powered from *DirectLOGIC* PLC via Communications Cable



### Panel Powered from a DC Power Adapter - Wiring Diagrams

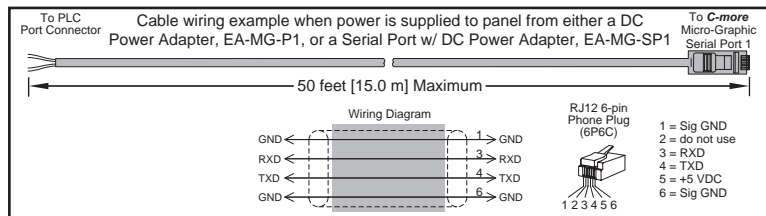


**NOTE:** If either DC power adapter is installed on the panel, the adapter must be powered.



**NOTE:** Recommended DC power supply to power either DC Power Adapter, *AutomationDirect* Part No. PSP24-024S or PSP24-024C.

### Maximum communication cable length when powered from an optional DC Power Adapter



## Step 7 – Accessing the Micro-Graphic Panel Setup Screens

The panel needs to be in the **Setup Menu** mode whenever a project is uploaded or downloaded. To access the **Setup Menu** of the panel's setup screens, press the the F1 and F5 function keys simultaneously for three (3) seconds.

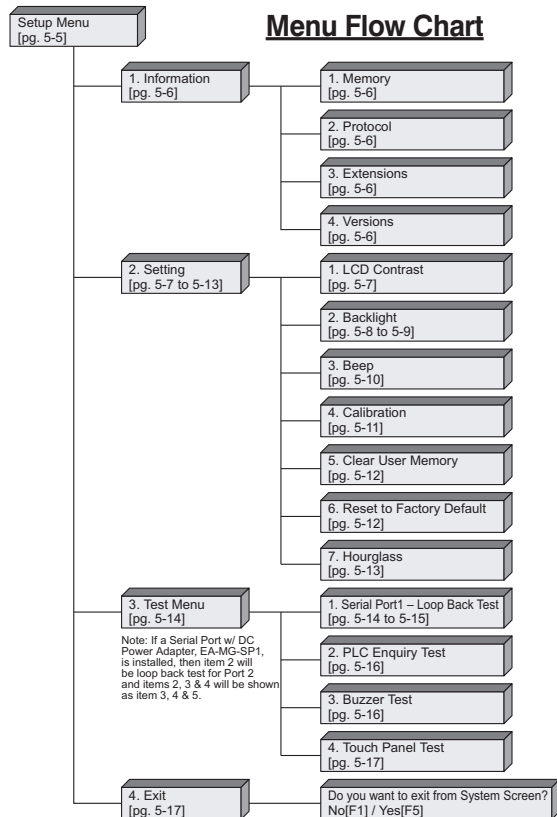
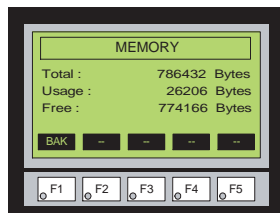
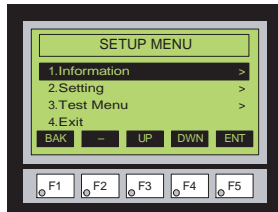


From the **Setup Menu**, information about the panel can be obtained, settings can be adjusted, and panel functions can be tested.



**NOTE:** See Chapter 5: System Setup Screens for details on using the setup screen settings and functions.

### Examples



## Step 8 – Choose Micro-Graphic Panel to PLC Protocol &amp; Cables

Available PLC  
Protocols

PLC Drivers	
Serial - port1 or port2	Serial - port2 only *
DirectLOGIC K-sequence	Allen-Bradley DF1 Half Duplex
DirectNET	Allen-Bradley DF1 Full Duplex
Modbus (Koyo Addressing)	Allen-Bradley PLC5 DF1
Modbus RTU	Allen-Bradley DH485
Entivity Modbus RTU	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
	Mitsubishi FX
	Omron Host Link (C200 Adapter, C500)
	Omron FINS Serial (CJ1, CS1)
	Siemens PPI (S7-200 CPU)
*Note: Serial port2 requires the use of EA-MG-SP1 adapter	

## Available purchased cables

Cable Description	Cable Part No.	Cable Description	Cable Part No.
<b>Cables for direct connect to panel's serial port 1 (Panel powered from PLC's serial port.)</b>		<b>Cables used with optional serial port 2 (Panel powered from optional Serial Port w/ DC Power Adapter, EA-MG-SP1.)</b>	
DirectLOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	DV-1000CBL	DirectLOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C).	EA-2CBL
DirectLOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	D4-1000CBL	DirectLOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).	EA-2CBL-1
DirectLOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) Use with DV-1000CBL cable.	FA-15HD	DirectLOGIC PLC RJ-11 port, D3-340 (RS-232C).	EA-3CBL
DirectLOGIC PLC 15-pin D-sub port, DL405 (RS-232C). Use with DV-1000CBL cable.	FA-CABKIT	DirectLOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).	EA-4CBL-1
<b>Cables for direct connect to panel's serial port 1 (Panel powered from either optional DC Power Adapter, EA-MG-P1, or Serial Port w/ DC Power Adapter, EA-MG-SP1.)</b>		DirectLOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C).	EA-4CBL-2
DirectLOGIC PLC RJ-11 port, D3-340 (RS-232C).	OP-3CBL-1	Allen-Bradley MicroLogix 1000, 1100, 1200 & 1500 (RS-232C)	EA-MLOGIX-CBL
		Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C)	EA-SLC-232-CBL
		Allen-Bradley PLC-5 DF1 port (RS-232C)	EA-PLC5-232-CBL
		GE 90/30, 90/70, Micro 90, Versamax Micro(Port2) 15-pin D-sub port (RS-422A)	EA-90-30-CBL
		MITSUBISHI FX Series 25-pin port (RS-422A)	EA-MITSU-CBL
		MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	EA-MITSU-CBL-1
		OMRON Host Link (C200 Adapter, C500) (RS-232C)	EA-OMRON-CBL



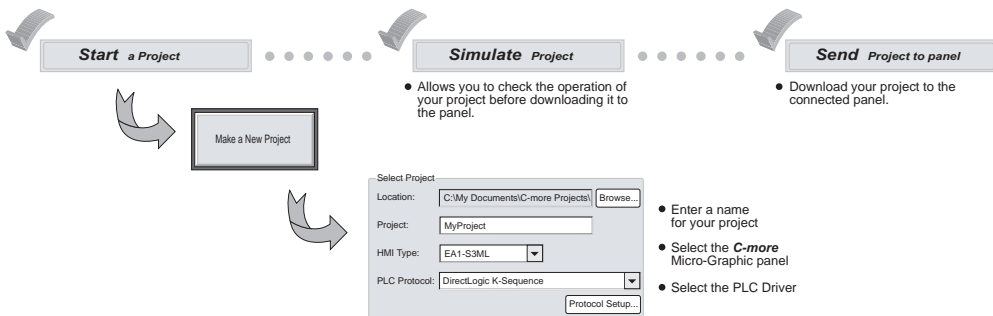
**NOTE:** See Chapter 6: PLC Communications for a detailed chart of PLC compatibility & cable connections. Chapter 6 includes wiring diagrams for end user construction of certain cables.

## Step 9 – Install the Programming Software and Develop a Project

Following are the minimum system requirements for running *C-more* Micro-Graphic Programming Software, EA-MG-PGMSW, on a PC:

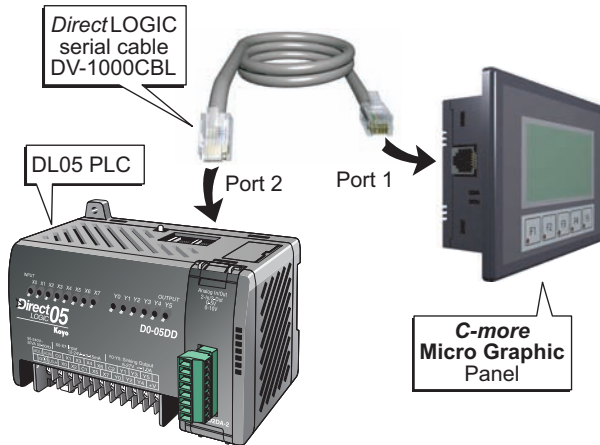
- Personal Computer with a 333 MHz or higher processor (CPU) clock speed recommended; Intel® Pentium/Celeron family, or AMD® K6/Athlon/Duron family, or compatible processor recommended
- Keyboard and Mouse or compatible pointing device
- Super VGA color video adapter and monitor with at least 800 x 600 pixels resolution (1024 x 768 pixels recommended) 64K color minimum
- 150 MB free hard-disk space
- 128 MB free RAM (512 MB recommended)
- CD-ROM or DVD drive for installing software from the CD, or internet access to download free programming software
- USB port to use with an EA-MG-PGM-CBL, USB to RS232 Programming Cable Assembly for project transfer from the programming software to the panel
- Operating System - Windows® XP Home / Professional Edition Service Pack 2 or Windows® 2000 with Service Pack 4

Insert the supplied CD-ROM into the PC's CD-ROM drive and follow the instructions. If you need assistance during the software installation, please refer to the supplied Software Installation Guide or call the *AutomationDirect* Technical Support team @ 770-844-4200.



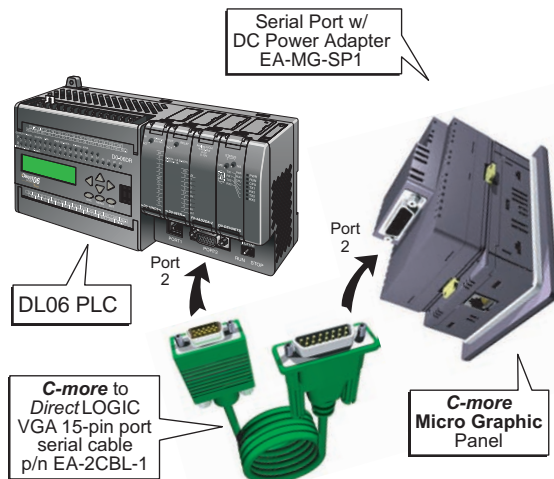
### Step 10 – Connect Micro-Graphic Panel to PLC

Connect the serial communications cable between the *C-more* Micro-Graphic panel and the PLC. The panel can be connected to the PLC via the panel's built-in RJ12 serial communications port (RS-232) or by using the optional EA-MG-SP1 Serial Port with DC Power Adapter, the panel can be connected to the PLC from the adapter's 15-pin serial communications port with either RS-232, RS-422 or RS-485 communications.



**Example of panel's Port 1 connected to a DL05 PLC**

**Example of panel's optional Port 2 connected to a DL06 PLC**



# SPECIFICATIONS

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## In This Chapter...

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## Available Models

The *C-more*® Micro-Graphic panels continue the next generation of HMI panels brought to you by *AutomationDirect*. They have been designed to display and interchange graphical data from a PLC by merely viewing, using the function keys, or touching the screen (touch screen model only).

The *C-more* Micro-Graphic panel is available in four models to suit your application. Refer to the following table for part numbers, descriptions and general specifications. See **Chapter 3: Accessories** for details on the available accessories for the *C-more* Micro-Graphic panels.

Micro-Graphic Panels	
Part Number	Description
<b>EA1-S3ML</b> 	3.1-inch <i>C-more</i> Micro-Graphic Touch Panel with green and red LED backlights. Supports 5 selectable backlight colors (Green, Red, Amber, Yellow and Lime). STN LCD monochrome, 128 x 64 dot display. Has 5 user-defined function keys with LED indicators. Power is supplied to the panel through the serial communication port connection when used with <i>Direct</i> LOGIC PLCs having an RJ12 communication port. EA-MG-SP1 (power supply with serial option module) required when connecting to third party PLCs. NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).
<b>EA1-S3ML-N</b> 	3.1-inch <i>C-more</i> Micro-Graphic Non-Touch Panel with green and red LED backlights. Supports 5 selectable backlight colors (Green, Red, Amber, Yellow and Lime). STN LCD monochrome, 128 x 64 dot display. Has 5 user-defined function keys with LED indicators. Power is supplied to the panel through the serial communication port connection when used with <i>Direct</i> LOGIC PLCs having an RJ12 communication port. EA-MG-SP1 (power supply with serial option module) required when connecting to third party PLCs. NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).
<b>EA1-S3MLW*</b> 	3.1-inch <i>C-more</i> Micro-Graphic Touch Panel with High Contrast white and red LED backlights. Supports 5 selectable backlight colors (White, Pink1, Pink2, Pink3 and Red). STN LCD monochrome, 128 x 64 dot display. Has 5 user-defined function keys with LED indicators. Power is supplied to the panel through the serial communication port connection when used with <i>Direct</i> LOGIC PLCs having an RJ12 communication port. EA-MG-SP1 (power supply with serial option module) required when connecting to third party PLCs. NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).
<b>EA1-S3MLW-N*</b> 	3.1-inch <i>C-more</i> Micro-Graphic Non-Touch Panel with High Contrast white and red LED backlights. Supports 5 selectable backlight colors (White, Pink1, Pink2, Pink3 and Red). STN LCD monochrome, 128 x 64 dot display. Has 5 user-defined function keys with LED indicators. Power is supplied to the panel through the serial communication port connection when used with <i>Direct</i> LOGIC PLCs having an RJ12 communication port. EA-MG-SP1 (power supply with serial option module) required when connecting to third party PLCs. NEMA 4/4X, IP-65 (when mounted correctly; for indoor use only).



**\*NOTE:** *C-more* Micro-Graphic panels with the letter "W" in the part number designate units with 5 selectable background colors of White, Pink1, Pink2, Pink3 and Red. Part numbers without the letter "W" are provided with 5 selectable background colors of Green, Red, Amber, Yellow and Lime.



**\*NOTE:** Software and Firmware Version 1.5 or later is required with models EA1-S3MLW and EA1-S3MLW-N. Available for free download at [www.automationdirect.com](http://www.automationdirect.com).

## Model Specifications

The following table on the next two pages provide details to the Specifications of each available *C-more* Micro-Graphic model.

Specification	Model	3” STN Micro-Graphic Panel Touch Screen	3” STN Micro-Graphic Panel non Touch Screen
Part Number:		EA1-S3ML, EA1-S3MLW	EA1-S3ML-N, EA1-S3MLW-N
Description:		128 x 64 dots LCD display, five user defined keypad function buttons, and five user defined LED's	
Display:			
• Type		3.1" STN monochrome LCD, graphical characters	
• Resolution		128 (W) x 64 (H) dots	
• Color		2 colors (normal / inverse)	
• Viewing Area Size		2.789" (W) x 1.385" (H) [70.8 mm x 35.2 mm]	
• Active Area Size		2.670" (W) x 1.259" (H) [67.8 mm x 32.0 mm]	
• Contrast		Adjusted from the panel's built-in configuration setup menu	
• Viewing Angle		3, 9 o'clock axis → 45 degrees 6 o'clock axis → 45 degrees 12 o'clock axis → 30 degrees	
Backlight:			
• Type		LED	
• Color		5 user defined colors:EA1-S3ML, EA1-S3ML-N - Red, Green, Amber, Lime, and Yellow EA1-S3MLW, EA1-S3MLW-N - White, Pink1, Pink2, Pink3 and Red	
• User Replaceable		No	
Touch Screen:			
•Type		Analog touch panel	N/A
• Operation		51 gram force [0.5 N] maximum	N/A
• Life		Minimum of 1,000,000 cycles	N/A
Features:			
• User Memory		768 kBytes	
• Number of Screens		Up to 999 – limited by project memory usage	
• Beep (Internal)		Yes	
• Keypad Function Buttons		Five user defined function key push buttons with the ability to label. Minimum of 500,000 cycles	
• Keypad Function Button LEDs		Each function key button includes a red LED that can be user programmed.	
• Serial Communications		Built-in RJ12 serial communications port (RS-232). Optional serial communications port (RS-232, RS-485/422) when using the optional EA-MG-SP1 Serial Port with DC Power Adapter.	
• Expansion Connection		Yes – used with optional Keypad Bezels, EA-MG-BZ1 & EA-MG-BZ2, and EA-MG-P1 DC Power Adapter, and EA-MG-SP1 Serial Port with DC Power Adapter.	

Specification table continued at the top of the next page.

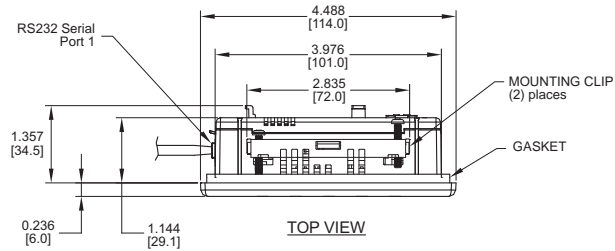


## Model Specifications (cont'd)

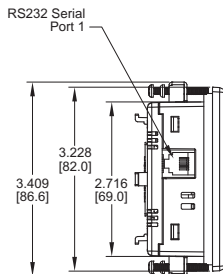
Specification	Model	3" STN Micro-Graphic Panel Touch Screen	3" STN Micro-Graphic Panel non Touch Screen
Part Number:		EA1-S3ML, EA1-S3MLW	EA1-S3ML-N, EA1-S3MLW-N
Screen Objects:			
• Functional Devices		Push Button, Switch, Indicator Button, Indicator Light, Graphic Indicator Light, Numeric Display, Numeric Entry, Inc/Dec Value, Bar Graph, Bitmap Button, Static Bitmap, Dynamic Bitmap, Recipe Button, Static Text, Lookup Text, Dynamic Text, Screen Change Push Button, Screen Selector, Adjust Contrast, Function.	
• Static Shapes		Lines, Rectangles, Circles and Frames	
• Displayable Fonts		Fixed fonts: 4x6 (only in static text), 6x6, 6x8, 8x16, 8x32, 16x16, 16x32, 32x16, 32x32, and Windows fonts	
Electrical:			
• Input Voltage Range		5.0 VDC (4.75 – 5.25 VDC)	
• Input Power		Supplied through the panel's RJ12 serial communications port connection when used with any <b>Direct LOGIC</b> PLCs having a RJ12 communication port. Can also be supplied from an external 12-24 VDC power source when using the optional EA-MG-P1 DC Power Adapter, or the optional EA-MG-SP1 Serial Port with DC Power Adapter.	
• Power Consumption		1.05 W @ 5 VDC (210 mA)	
• Recommended Fuse		Type AGC fast acting glass fuse, 250 mA, 250 VAC, AGC p/n AGC-25 No fuse required when directly connected to a PLC or PC with recommended cable.	
• Max. Inrush Current		1 A for 500 µs	
• Acceptable External Power Drop		Maximum 1 ms	
Environmental:			
• Operating Temperature		0 to 50 °C (32 to 122 °F)	
• Storage Temperature		-20 to +60 °C (-4 to +140 °F)	
• Humidity		5–95% RH, non-condensing	
• Environmental Air		No corrosive gases permitted	
• Vibration		IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)	
• Noise Immunity		EMA ICS3-304 RFI, (145 MHz, 440 MHz 10 W @ 10 cm) Impulse 1000 V @ 1 µs pulse	
• Enclosure		NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)	
• Agency Approvals		CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382	
Physical:			
• Dimensions		4.488" (W) x 3.228" (H) x 1.593" (D) [114.0 mm x 82.0 mm x 40.5 mm]	
• Enclosure Mounting Thickness Range		0.04" – 0.2" [1 – 5 mm]	
• Mounting Clip Screw Torque Range		21 – 28 oz-in [0.15 – 0.2 Nm]	
• Depth from bezel rear with options Module		2.295" [58.3 mm]	
• Weight		5.82 oz. (165 g)	

## Panel Dimensions (all models)

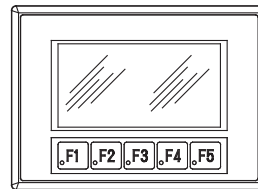
### Panel Dimensions



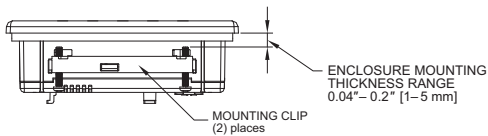
Units: inches [mm]



### C-more Micro-Graphic Panel

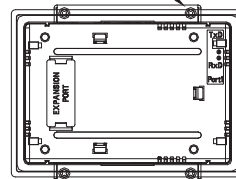


### Enclosure Thickness



### Mounting Clip Screw Torque

MOUNTING CLIP  
SCREW TORQUE RANGE  
21-28 oz-in [0.15-0.2 Nm]

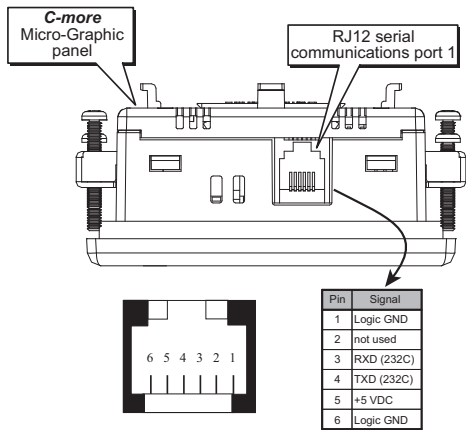


**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

Communications Ports

2

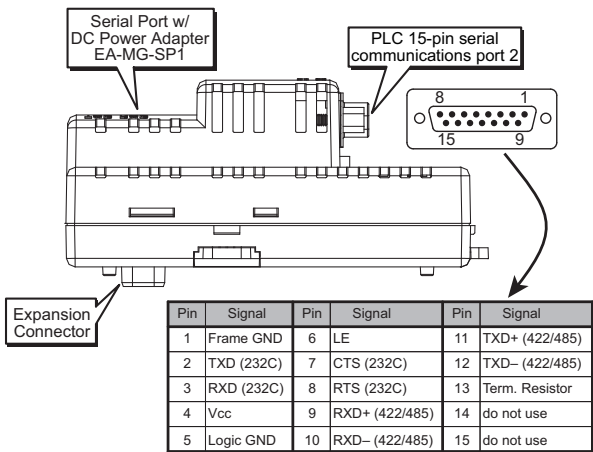
Port 1 (built-in)



Port 2 (optional)



**NOTE:** If the DC power adapter is installed on the panel, the adapter must be powered and the panel not dependent on +5 VDC from the PLC's RJ12 comm port.



NOTE: Adapter requires 10.8-26.4 VDC supply.



**NOTE:** The panel has one built-in RJ12 serial communications port (Port 1 - RS-232) and the option to add one 15-pin serial communications port (Port 2 - RS-232/422/485) to the panel by installing the EA-MG-SP1 module. **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port 1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## Chemical Compatibility

The *C-more* Micro-Graphic panels are composed of three different materials that may be exposed to elements outside of the enclosure. The panel's screen in both touch and non-touch models has a polyester (PET) surface. The bezel uses ABS plastic materials and the panel's gasket is a silicone rubber material. The following tables are provided to make you aware of the general compatibility between chemicals that may be present in your work environment and the various materials used in the panel. Use the table to determine those chemicals that are safe to use around your *C-more* Micro-Graphic panel and those that may harm it. The tables are made up of specifications provided by the manufacturer of the listed material. The tables rate these chemicals as either Excellent, Good, Not Recommended, or Not Usable. Because the ratings are for ideal conditions at room temperature, consider all factors when evaluating your application. Areas left blank have not been tested by the manufacturer and therefore information of compatibility is not available.

The values in [brackets] represent the chemical's density at RT (room temperature), (20 °C).

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Acetaldehyde		Not Recommended	
Acetic Acid		[10, RT] Excellent	
		[10, RT] Excellent	
		[50, RT] Not Usable	
		[50-70, RT] Not Usable	
		[100, RT] Not Usable	
Acetic anhydride		Not Recommended	
Acetone	Excellent	Not Usable	
Acetophenone		Not Usable	
Acetylene		Excellent	
Acrylonitrile		Not Recommended	
Alcohol - Butyl Ether			Excellent
Alcohol - Ethanol			Excellent
Alcohol - Isopropyl			Excellent
Alums NH <sub>3</sub> , Cr, K		Excellent	
Aluminum acetate		Excellent	
Aluminum bromide		Good	
Aluminum chloride		Good	
Aluminum nitrate		Excellent	
Aluminum sulfate		Excellent	
Ammonia [anhydrous]		Good	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Ammonia gas [cold]		Good	
Ammonia liquid		Good	
Ammonia water		[12%] Not Usable	
		[28%] Not Usable	
Ammonium carbonate		Excellent	
Ammonium chloride		Excellent	
Ammonium hydroxide [ammonia water]		Excellent	
Ammonium nitrate		Excellent	
Ammonium persulfate		Excellent	
Ammonium phosphate		Excellent	
Ammonium sulfate		Excellent	
Amyl acetate		Not Usable	
Amyl alcohol		Good	
Aniline dyes		Not Recommended	
Animal oil [lard]		Good	
Aqua regia		Not Usable	
Arsenic acid		Not Recommended	
Asphalt		Excellent	
Barium chloride		Excellent	
Barium hydroxide		Excellent	
Barium sulfate		Excellent	
Barium sulfide		Excellent	
Beer		Excellent	
Beet sugar liquors		Excellent	
Benzaldehyde		Not Recommended	
Benzene [Benzol]		Not Recommended	
Benzene	Excellent		
Benzine		Not Usable	Not Usable
Benzyl alcohol		Not Recommended	
Benzyl benzoate		Not Usable	
Benzyl chloride		Not Usable	
Borax		Excellent	
Boric acid		Good	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Bromine		Not Usable	
Butane		Excellent	
Butter		Good	
Butyl acetate		Not Usable	
Butyl acrylate		Not Usable	
Butyl alcohol		[Butanol] Good	
Calcium acetate		Excellent	
Calcium bisulfite		Good	
Calcium chloride		Excellent	
Calcium hydroxide		Excellent	
Calcium hypochlorite		[20,RT] Excellent	
Calcium nitrate		Excellent	
Calcium sulfide		Excellent	
Cane sugar liquors		Excellent	
Carbon dioxide		Excellent	
Carbon disulfide		Not Usable	
Carbonic acid		Good	
Carbon tetrachloride	Excellent	Not Usable	
Castor oil		Not Recommended	
China wood [tung] oil		Excellent	
Chlorine gas [dry]		Not Usable	
Chlorine gas [wet]		Not Usable	
Chlorine liquid		Not Usable	
Chlorinated solvents		Not Usable	
Chloroacetic acid		Not Usable	
Chloroacetone		Not Usable	
Chloroform	Excellent	Not Usable	
Chlorophenol	Not Usable		
Chlorosulfonic acid		Not Usable	
Chlorotoluene		Not Usable	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Chromic acid		[2, 70 °C] Not Usable	
		[5, 70 °C] Not Usable	
		[10, 70 °C] Not Usable	
		[25, 70 °C] Not Usable	
Citric acid		Good	
Cocoa nut oil		Good	
Copper chloride		Excellent	
Copper cyanide		Excellent	
Copper sulfate		Excellent	
Corn oil		Good	
Cottonseed oil		Good	
Creosol		Not Usable	
Cyclohexane		Good	
Cyclohexanol		Good	
Cyclohexanone		Not Usable	
Developing solutions [Hypos]		Excellent	
Dibutyl phthalate [DBP]		Not Usable	
Dichlorobenzene		Not Usable	
Diethylene glycol		Good	
Diethyl ether		Not Usable	
Disopropyl ketone		Not Usable	
Dimethyl aniline		Not Usable	
Dimethyl formamide		Not Usable	
Dioxane		Not Usable	
Dipentene		Not Usable	
Epichlorohydrine		Not Usable	
Ethyl acetate	Excellent	Not Usable	
Ethyl acetoacetate		Not Usable	
Ethyl acrylate		Not Usable	
Ethyl alcohol	Excellent	Not Recommended	
Ethyl benzene		Not Usable	
Ethyl chloride		Not Usable	
Ethylene chlorohydrin		Not Usable	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Ethylene diamine		Not Usable	
Ethylene dichloride		Not Usable	
Ethylene glycol		Excellent	
Ethylene oxide		Not Usable	
Fatty acid		Good	
Ferric chloride		Excellent	
Ferric nitrate		Excellent	
Ferric sulfate		Excellent	
Fluorboric acid		Not Recommended	
Fluorobenzene		Not Usable	
Fluosilicic acid		Not Recommended	
Formaldehyde		[40, RT] Good	
		[25, RT] Excellent	
		[50, RT] Good	
		[90, RT] Not Recommended	
Freon	[45°C] Excellent		
Freon 11		Not Recommended	
Freon 12		Good	
Freon 113		Not Usable	
Freon 114		Not Recommended	
Fuel oil		Good	
Gasoline		Not Recommended	
Gelatin		Excellent	
Glauber's salt		Excellent	
Glue		Excellent	
Glycerin		Excellent	
Grease		Excellent	
Hexane		Not Recommended	
Hexyl alcohol		Good	
Hydrobromic acid		[20,RT] Not Usable	
		[20-70,RT] Not Usable	
		[37,RT] Not Usable	

Table continued at top of next page.



## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Hydrochloric acid	[15%] Excellent	[10,RT] Excellent	Good
		[20,RT] Good	
	[30%] Good	[20-80, RT] Not Recommended	
		[38,RT] Not Recommended	
Hydrocyanic acid		Excellent	
Hydrofluoric acid		[10,RT] Excellent	
		[20,RT] Excellent	
		[40,RT] Good	
Hydrofluoric acid anhydrous		Not Usable	
Hydrogen		Excellent	
Hydrogen peroxide		[5,RT] Not Recommended	
		[5-50, RT] Not Recommended	
		[30,RT] Not Usable	
Hydrogen sulfide		Excellent	
Hydroquinone		Not Recommended	
Hypochlorous acid		Not Recommended	
Isobutyl alcohol		Good	
Isopropyl acetate		Not Usable	
Isopropyl alcohol		Good	
JP fuels (1-6)		Good	
Kerosene		Good	
Lacquer		Not Usable	
Lactic acid		Excellent	
Lard		Excellent	
Lead acetate		Excellent	
Lead nitrate		Good	
Lead sulfamate		Good	
Linoleic acid		Excellent	
Linseed oil		Excellent	
Liquified petroleum gas [LPG]		Excellent	
Lubricating oil		Excellent	
Lye solution		Excellent	
Magnesium chloride		Excellent	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Magnesium hydroxide		Excellent	
Magnesium sulfate		Excellent	
Maleic acid		Excellent	
Mercuric chloride		Excellent	
MEK	Good		
Mercury		Excellent	
Metacresol	Not Usable		
Methyl acetate		Not Usable	
Methyl alcohol	Excellent	Not Recommended	
Methyl Benzoate	Not Usable		
Methyl chloride		Not Usable	
Methyl ethyl ketone [MEK]		Not Usable	
Methyl isobutyl ketone [MIBK]		Not Usable	
Methyl methacrylate		Not Usable	
Methyl dichloride		Not Usable	
Methyl Salicylate	Not Usable		
Milk		Excellent	
Mineral oil		Excellent	Excellent
Monochlorobenzene	Not Usable	Not Usable	
Naptha		Good	
Napthalene		Excellent	
Napthenic acid		Good	
Natural gas		Excellent	
Natural oil			Excellent
Nickel acetate		Excellent	
Nickel chloride		Excellent	
Nickel sulfate		Excellent	
Nitric acid	[30%] Good	[10, RT] Good	
		[10-70, RT] Not Usable	
		[30, RT] Not Usable	
	[30%] Not Usable	[30-70, RT] Not Usable	
		[61.3, RT] Not Usable	
		[Vapor, RT] Not Usable	Not Usable

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Nitrobenzene	Not Usable	Not Usable	
Nitroethane		Not Usable	
Nitromethane		Not Usable	
Nitropropane		Not Usable	
Nitrogen		Excellent	
Octyl alcohol		Good	
Oleic acid		Excellent	
Olive oil		Excellent	
Oxalic acid		Excellent	
Oxygen		Excellent	
Ozone		Not Recommended	
Palmitic acid		Excellent	
Perchloroethylene		Not Usable	
Petroleum		Excellent	
Phenol	Not Usable	Not Usable	
Phosphoric acid		[50, RT] Good	
		[50-70, RT] Not Usable	
		[75, RT] Not Usable	
Pickling solution		[Sulfuric acid 20% + nitric acid 4%] Good	
		[Sulfuric acid 40% + nitric acid 15%] Not Recommended	
Pine oil		Good	
Potassium chloride		Excellent	
Potassium cyanide		Excellent	
Potassium dichromate		[10, RT] Excellent	
Potassium hydroxide	[10%] Not Usable	Excellent	
Potassium nitrate		Excellent	
Potassium permanganate		[5, RT] Excellent	
Potassium sulfate		Excellent	
Propane		Excellent	
Propyl acetate		Not Usable	
Propyl alcohol		Good	

Table continued at top of next page.

## Chemical Compatibility (cont'd)

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Salt water		Excellent	
Silicone oils		Good	
Silver nitrate		Excellent	
Skydrol 500		Not Usable	
Skydrol 7000		Not Usable	Not Usable
Soap solutions		Excellent	
Soda ash		Excellent	
Sodium bicarbonate		Excellent	
Sodium bisulfate		Good	
Sodium borate		Excellent	
Sodium carbonate	[10%] Excellent		
Sodium chloride		Excellent	
Sodium cyanide		Excellent	
Sodium hydroxide	[1%] Excellent	[10, RT] Excellent	
		[30, RT] Excellent	
	[10%] Not Usable	[30-70, RT] Not Usable	
Sodium hydrochlorite		[5, RT] Excellent	
		[5-70, RT] Not Usable	
Sodium metaphosphate		Excellent	
Sodium nitrate		Excellent	
Sodium perborate		Excellent	
Sodium peroxide		Not Usable	
Sodium phosphate		Excellent	
Sodium thiosulfate		Excellent	
Sodium sulfate [Glauber's salt]		Good	
Sodium sulfite		Excellent	
Soybean oil		Excellent	
Stannic chloride		Good	
Steam		[below 150 degrees] Not Usable	
Steam		[above 150 degrees] Not Usable	
Stearic acid		Excellent	
Styrene		Not Recommended	
Sucrose solutions		Excellent	

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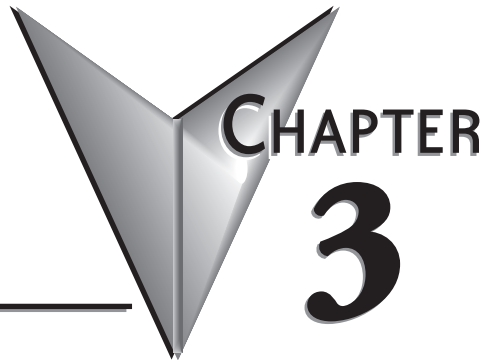
## Chemical Compatibility (cont'd)

2

Chemicals	Screen Sheet – PET [Density %, Temperature °C]	Bezel – ABS [Density %, Temperature °C]	Gasket – Silicone [Density %, Temperature °C]
Sulfur		Excellent	
Sulfur dioxide		Good	
Sulfuric acid	[20%] Excellent	[10, RT] Excellent	Not Usable
		[10-70, RT] Not Usable	
	[60%] Excellent	[30, RT] Excellent	
		[30-70, RT] Not Recommended	
	[80%] Not Usable	[98, RT] Not Usable	
		[Vapor, RT] Not Usable	
Sulphurous acid		[10, RT] Good	
Tannic acid		Good	
Tar		Not Recommended	
Tartaric acid		Excellent	
Terpineol		Not Recommended	
Tetrachloroethane	Excellent	Not Usable	
Tetraethyl lead		Good	
Tetralin	Not Usable		
Tetrahydrofuran		Not Usable	Not Usable
Thionyl chloride		Not Usable	
Toluene	Excellent	Not Usable	Not Usable
Trichloroethylene [Trichlene]		Not Usable	
Triethanol amine		Good	
Turpentine oil		Good	
Vegetable oil		Good	
Vinegar		Excellent	
Water		Excellent	
Whiskey		Excellent	
Xylene	Excellent	Not Usable	
Zeolites		Excellent	
Zinc acetate		Excellent	
Zinc chloride		Excellent	
Zinc sulfate		Excellent	

# ACCESSORIES

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## Accessories

3

### Micro-Graphic Programming Software & Programming Cable

Part Number		Description
EA-MG-PGMSW		<b>C-more</b> Micro-Graphic panel Windows-based configuration software. Requires Windows 2000 with Service Pack 4 or XP Home or Professional with Service Pack 2. Requires USB port connection from PC to touch panel. Includes CD-ROM. Programming cable (EA-MG-PGM-CBL) sold separately. Downloadable version available from the Web site at no charge. Software Help Files included in download.
EA-MG-PGM-CBL		6-ft. cable assembly to connect personal computer to any <b>C-more</b> Micro-Graphic panel for setup and programming. (Note: This cable assembly uses the PC's USB port and converts the signals to serial transmissions. The USB port supplies 5 VDC to the Micro-Graphic panel for configuration operations). Assembly includes standard USB A-type connector to B-type connector cable, custom converter, and an RS232C cable with RJ12 modular connector on each end.

### Micro-Graphic Panel Accessories

Part Number		Description
EA-MG-BZ1		8-button keypad bezel for <b>C-more</b> Micro-Graphic panels, with 4 arrow adjust keys, and ESCAPE, MENU, CLEAR and ENTER buttons. Helps to reduce screen wear in heavy-duty applications where operators can use the keypad. Designed for easy drop-in of the Micro-Graphic panels. No panel configuration is required.
EA-MG-BZ2		20-button keypad bezel with numeric keypad for <b>C-more</b> Micro-Graphic panels, with 4 arrow adjust keys, and ESCAPE, MENU, CLEAR and ENTER buttons. Helps to reduce screen wear in heavy-duty applications where operators can use the keypad to enter numeric data. Designed for easy drop-in of the Micro-Graphic panels. No panel configuration is required.
EA-MG-P1		Optional DC Power Adapter for <b>C-more</b> Micro-Graphic panels. Required when using third party PLCs, or when using 24 VDC power instead of the 5 VDC supplied from the RJ12 connector of a <b>DirectLOGIC</b> PLC.
EA-MG-SP1		Optional Serial Port with DC Power Adapter for <b>C-more</b> Micro-Graphic panels. Serial port is a D-Sub 15-pin RS-232/RS-422/485 connector. Required when using RS422, RS485 or third party PLCs.
EA-MG-COV-CL		Optional clear screen overlay used to protect <b>C-more</b> Micro-Graphic displays from minor scratches and wear. Package contains 5 clear screen overlays.

# Micro-Graphic Programming Software

**C-more®** Micro-Graphic Programming Software is a spin-off of its powerful sibling **C-more** Touch Panel Programming software. It offers very high end features designed to reduce your configuration time. Simply drag and drop the objects from the object list (right side of screen) onto the the screen construction area. Then configure your PLC tags and click on the objects you wish to use. Use the built-in simulator to review your work on your PC before ever downloading your project!



3



**NOTE:** Software and Firmware Version 1.5 or later is required with models EA1-S3MLW and EA1-S3MLW-N. Available for free download at [www.automationdirect.com](http://www.automationdirect.com).

## Thumbnail project preview pane

Helps keep track of multi-screen projects.

## Built-in user object/screen libraries

Save time by re-using your custom objects and screens.

## Scrolling object selection window

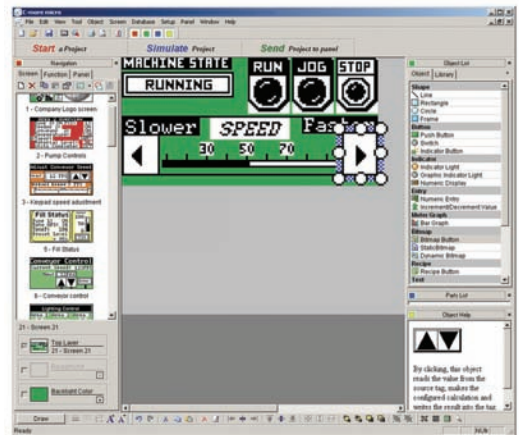
Lets you find the object you want fast. Just drag and drop it on the screen.

## Scrolling help window

Gives you helpful information on each object

## Built-in project simulator

- Runs your project on your PC
- Test all of your screens before downloading
- Time savings pays for the panel



## PC Requirements:

Following are the minimum system requirements for running **C-more** Micro-Graphic Programming Software, EA-MG-PGMSW, on a PC:

- USB port for project transfer from software to **C-more** Micro-Graphic panel
- Personal Computer with a 333 MHz or higher processor (CPU) clock speed recommended; Intel® Pentium/Celeron family, or AMD® K6/Athlon/Duron family, or compatible processor recommended
- Keyboard and Mouse or compatible pointing device
- Super VGA color video adapter and monitor with at least 800 x 600 pixels resolution (1024 x 768 pixels recommended) 64K color minimum
- 150 MB free hard-disk space
- 128 MB free RAM (512 MB recommended)
- CD-ROM or DVD drive for installing software from the CD or internet access to download
- Operating System - Windows® XP Home / Professional Edition with Service Pack 2 or Windows® 2000 with Service Pack 4





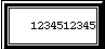

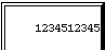
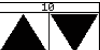


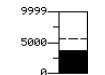
# Micro-Graphic Programming Software (cont'd)

## C-more Micro-Graphic Panel Objects

Object	Graphic	Object	Graphic
The <b>Line</b> object, just like with drawing tools, allows the user to insert a straight line drawing into a project. When a Line is inserted into a project, a window opens to allow the user to setup all available parameters for the Line object. Some of the uses for Line Objects include but are not limited to adding callouts, pointers, or indicators.		The <b>Bitmap Button</b> object offers the ability to use a Bitmap graphic to perform the functions of a Button. This allows users to create their own graphics and implement them within the software project. The Bitmap Button object can be used to activate or deactivate components assigned to a Discrete Tag Name. The <b>C-more</b> Micro-Graphic display only supports two colors, black and white.	
The <b>Rectangle</b> object, just like with drawing tools, allows the user to insert a drawing of a Rectangle as well as other geometric shapes into a project. When this object is inserted into a project, a window opens to allow the user to setup all available parameters for the Rectangle object.		The <b>Static Bitmap</b> offers the ability to display a Bitmap graphic on any screen. The Static Bitmap does not change state. Refer to the Dynamic Bitmap Object if you require the graphic object to change state based on a Tag Value in your PLC. The dialog box for a "Static Bitmap" object allows you to "read from disk" and select a bitmap file for import. Bitmaps must be in one of the following formats: .BMP .WMF .JPG .JPEG	
The <b>Circle</b> object, just like with drawing tools, allows the user to insert a drawing of a Circle or ellipse shape into a project. When this object is inserted into a project, a window opens to allow the user to setup all available parameters for the Circle object.		The <b>Dynamic Bitmap</b> object offers the ability to make an object using two different Bitmap graphics that will display one graphic when the Tag is On and a different graphic when the Tag is Off. Use your own bitmap designs or use some of the bitmaps provided with the software that are located in the User Graphic Library.	
The <b>Frame</b> object allows the user to insert a Frame to the project that can be used to Frame other objects. Some of the uses for Frame Line object include but are not limited to graphically separating objects for different operations that may appear on one screen and emphasizing pushbuttons or other objects that may require more attention by the operator.		<b>Recipe</b> objects make it easy to make a large number of tag changes with the push of a single button. Create Recipes with up to 99 entries, and multiple sets of values. Then just push a button to load an entire set of values into the group of recipe tags.	
The <b>Pushbutton</b> object is available from the Button Category of the Object List window. The Pushbutton object is an electronic version of a typical Pushbutton normally found on control panels. The Pushbutton object can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Static Text</b> object is used to display a Frame with a personalized Message. This Frame and Message can be placed on any screen and any location within the screen.	
The <b>Switch</b> object is an electronic version of a typical Switch that normally can be found on control panels. The Switch object can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Lookup Text</b> object is used to display a Frame with a personalized Message. This Frame and Message can be placed on any screen and any location within the screen. The object is always displayed like a sign but is configured to display only the message prompted by an assigned Tag Name. Messages are retrieved from a Message Database which is configured by the user with text defined by the user. The Lookup Text Object will scroll text up to 128 characters.	
The <b>Indicator Button</b> object is available from the Button Category of the Object List window. The Indicator Button object is an electronic version of a typical Indicator Button normally found on control panels. The Indicator Button is a combination of a Pushbutton and an Indicator Light. The Indicator Button can be used to activate or deactivate components assigned to a Discrete Tag Name.		The <b>Dynamic Text</b> object is used to display text that is retrieved from data stored in a Tag. The Tag Name is assigned to registers in the PLC that contain set character data. The data can be stored in the PLC in ASCII format and may include information such as machine numbers, locations, part numbers, and such. The Message can be configured to be visible (Trigger) when an associated Tag Name is On or Off. This object can be placed on any screen and any location within the screen. The Dynamic Text Object will scroll text up to 40 characters.	
The <b>Indicator Light</b> object is an electronic version of a typical Indicator Light normally found on industrial control panels. The Indicator Light can be configured to display the status of the assigned Discrete Tag Name.		The <b>Scroll Text</b> object is available from the Text Category of the Object List window. The Scroll Text object is an electronic version of a marquee. It is similar to the Static Text Object. If the text in the object does not fit in the window, it will scroll from right to left across the window. The Scroll Text object does not require a Tag Name assignment. The Scroll Text Object has a maximum character limit of 128 characters.	
The <b>Graphic Indicator Light</b> object is a more enhanced version of the "Indicator Light Object" that allows the user to choose more detailed graphics to display the status of a tag. This object is an electronic version of a typical Indicator Light normally found on industrial control panels. The Indicator Light can be configured to display the status of the assigned Discrete Tag Name.		The <b>Screen Change Pushbutton</b> object is available from the Control Category of the Object List window. The Screen Change Pushbutton object is a pushbutton that can be configured to activate another screen in the project. This object may be edited to various colors and sizes. Users can configure the button to activate the Power-Up screen, Forward Screen, Previous Screen, or any one of the project screens.	

C-more Micro-Graphic Panel Objects continued at top of next page.

## Micro-Graphic Programming Software (cont'd)

C-more Micro-Graphic Panel Objects			
Object	Graphic	Object	Graphic
The <b>Numeric Display</b> consists of a frame that displays a real-time numeric value according to the value data received from an assigned Tag Name. The Numeric Display supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal points. User Defined Alpha Numeric Prefix and Suffix values are also supported.		The <b>Screen Selector</b> object is available from the Control Category of the Object List window. This object is an enhanced version of the Screen Change pushbutton in that it offers many more features and defaults with data from screens in the project. This helps to save time by not having to create Screen change buttons for each screen. This object may be edited to various colors and sizes.	
The <b>Numeric Entry</b> object is used to enter a value from your Panel to a PLC Register. This object, when selected, opens a Numeric Keypad that allows the user to enter a new value that will be written to the assigned Tag Name. The Numeric Entry supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal points. User Defined Alpha Numeric Prefix and Suffix values are also supported.		The <b>Adjust Display Contrast</b> object is used to allow the operator to adjust the Panel Display Contrast. The default Display setting often works in most applications, however lighting may vary based on the location of each application. In these cases the operator can use this object to make adjustments. The current display setting value will appear on the top of the button and will change as the arrow keys are pressed. This button can be modified to various sizes.	
The <b>Increment/Decrement Value</b> object is used to add or subtract a value by pressing a button on the Panel. Basically the object uses two Tags, one to read a value from and another to write a modified value to. The Increment/Decrement Value supports numeric Signed Decimal, Unsigned Decimal, BCD, and Floating Point data types with up to 11 digits, including decimal points. The Increment and decrement values are also user selectable.		The <b>Function</b> object is used to assign the panel's function key buttons to a particular action as well as to assign the control of the LED On/Off status. When a button has been assigned as a shift button, the then F1 through F5 will become F6 through F10. The Function Object buttons will activate when the hardware button is pressed or when the object is pressed on the Touch panel version. The object size is restricted so that the keys will line up with the hardware function keys on the panel.	
The <b>Bar Meter</b> object is used to monitor up to two assigned Tag Names continuously. This object has various appearances depending upon the relative value of the tags. The Bar Meter can be used to create digital versions of level, current, and flow meters to name a few samples, or gauges that measure speed and other measurable data.			

## USB to RS-232 Programming Cable Assembly

Using the *C-more* Micro-Graphic Programming Software for project development, the *C-more* Micro-Graphic panel can be connected to a PC (personal computer) by using EA-MG-PGM-CBL, the USB-to-RS-232 cable assembly.

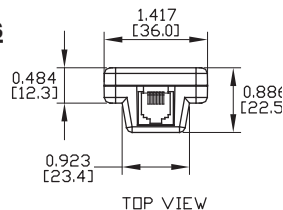
- Connect the USB programming cable (included) from a USB port type A on the PC to the USB type B port on the converter (included). Next connect the serial programming cable from the converter's RJ12 port to the panel's RJ12 serial port. The panel receives power from the USB port of the PC that it is connected to through the USB to RS-232 converter assembly.

### EA-MG-PGM-CBL



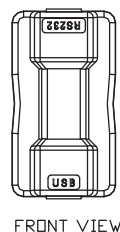
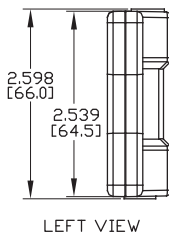
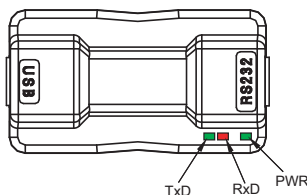
### Converter Dimensions

Units: inches [mm]

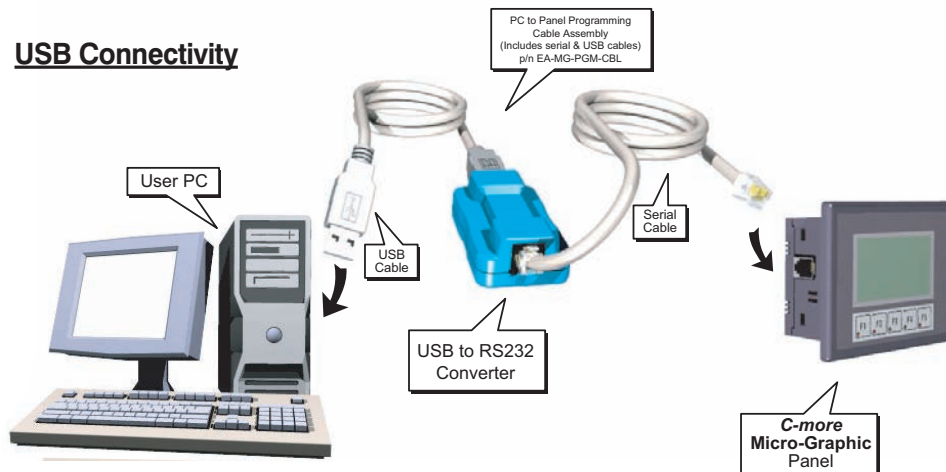


### Converter Status LEDs

LED Status Indicators



### USB Connectivity



USB to RS-232 Programming Cable Assembly continued at top of next page.

## USB to RS232 Programming Cable Assembly (cont'd)

USB to RS232 Converter Specifications	
Part Number:	EA-MG-PGM-CBL
Description:	6-ft. cable assembly to connect personal computer to any <b>C-more</b> Micro-Graphic panel for setup and programming. (Note: This cable assembly uses the PC's USB port and converts the signals to serial transmissions. The USB port supplies 5 VDC to the Micro-Graphic panel for configuration operations.) Assembly includes standard USB A-type connector to B-type connector cable, custom converter, and an RS232C cable with RJ12 modular connector on each end.
Hardware:	
• USB Interface	USB Specification Rev. 1.1 Connector: USB Type B jack to accept USB Type B cable plug
• Serial Interface	RS232 (EIA-232-E) Connector: RJ12 phone jack 6p to accept RJ12 cable plug
• Baud Rate	115.2 kbps Maximum
• Input Voltage	5 VDC (Supplied thru serial interface cable.)
• Power Consumption	50 mA (Does not include power to panel and/or bezel.)
Accessory Cables:	
• USB Cable	USB Type A plug to PC on one end, USB Type B plug to converter on other end, 0.30 m [1 foot] length (* Note)
• Serial Cable	RJ12 phone plug connectors on both ends, 2.0 m [6.56 feet] length (* Note)
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
Physical:	
• Dimensions	2.559" (W) x 1.417" (H) x 0.886" (D) [65.0 mm x 36.0 mm x 22.5 mm]
• Weight	1.06 oz. [30 g]
* Note: Maximum cable length for either the USB or serial cable should not exceed 2.0 m [6.56 feet] in length.	

## 8-Button Keypad Bezel

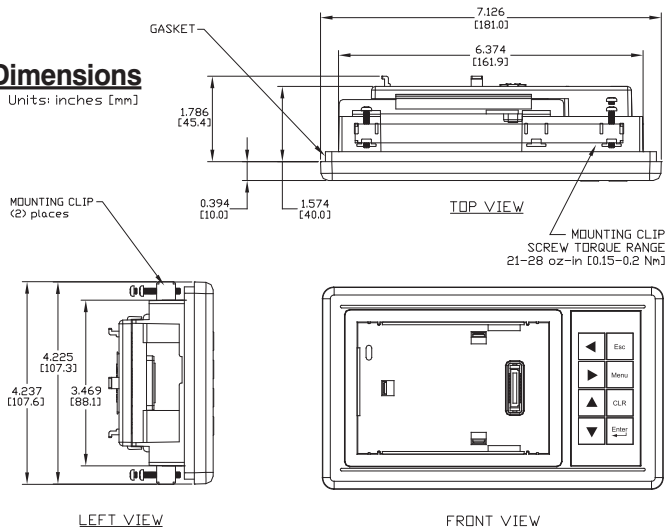
The 8-button keypad bezel can be used with both the touch and non-touch Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object to allow changing of a value, and can also be used to navigate & select screen objects when using the non-touch panel version. The cursor left and right buttons are used to select a digit and the cursor up and down buttons to change the value, along with the ENTER and CLEAR buttons. It can also be used to access and navigate the screen selector feature. The keypad bezel is designed for easy drop-in of a *C-more* Micro-Graphic panel. No panel configuration is required.

### EA-MG-BZ1

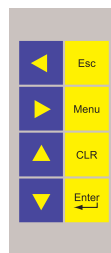
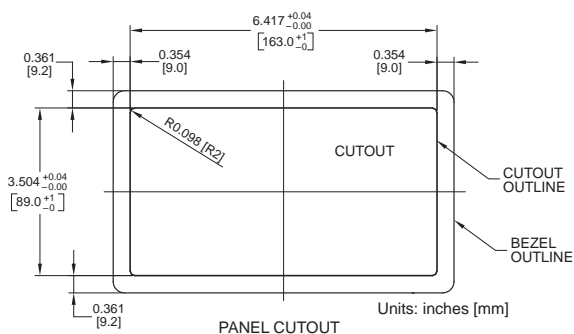


### Dimensions

Units: inches [mm]

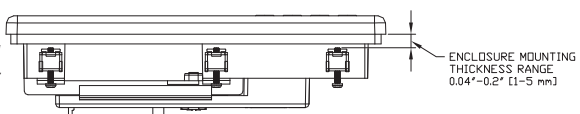


### Panel Cutout



Four directional  
cursor buttons, and  
ESC, MENU, CLEAR  
and ENTER buttons.

### Panel Thickness



**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

8-Button Keypad Bezel continued at top of next page.

## 8-Button Keypad Bezel (cont'd)

8-Button Keypad Bezel Specifications	
Part Number:	EA-MG-BZ1
General:	
• Micro-Graphic Panels Supported	EA1-S3ML, EA1-S3MLW, EA1-S3ML-N, EA1-S3MLW-N
• Connection	Connects with expansion connector on the rear of the <b>C-more</b> Micro-Graphic panel. An expansion connector is also on the rear of the keypad bezel to allow the EA-MG-P1 DC Power Adapter, or the EA-MG-SP1 Serial Port with DC Power Adapter to be attached.
• Power Consumption	None
• Keypad Button Life	Minimum of 500,000 cycles
• Enclosure Mounting	(2) mounting clips, EA-MG-BZ1-BRK, included. Note: The <b>C-more</b> Micro-Graphic panel is installed into the keypad bezel using the mounting clips, EA-MG-S3ML-BRK, that are supplied with the panel.
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	EMA ICS3-304 RFI, (145 MHz, 440 MHz 10 W @ 10 cm) Impulse 1000 V @ 1 µs pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	7.126" (W) x 4.225" (H) x 2.180" (D) [181.0 mm x 107.3 mm x 55.4 mm]
• Weight	7.05 oz. [200 g]

8-button Keypad Bezel  
EA-MG-BZ1



8-Button Keypad Bezel continued at top of next page.

## 8-Button Keypad Bezel (cont'd)

### Panel and 8-Button Keypad Bezel Assembly

3

2. Use the (2) Panel Mounting Clips, EA-S3ML-BRK, that are supplied with the panel, to secure panel to keypad bezel. Tighten screws to a torque of 21-28 oz-in [0.15-0.2 Nm].

1. Remove Expansion Connector Protective Cover from rear of panel.

3. Use (2) Bezel Mounting Clips, EA-BZ1-BRK, to secure keypad bezel through enclosure cutout. Tighten screws to a torque of 21-28 oz-in [0.15-0.2 Nm].

8 Button Keypad Bezel  
EA-MG-BZ1

C-more Micro-Graphic Panel

4. Peel Protective Film from front of panel.



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

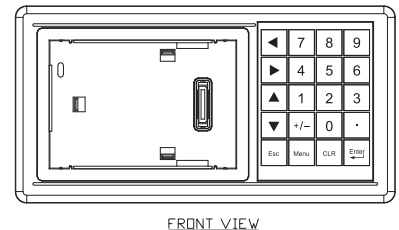
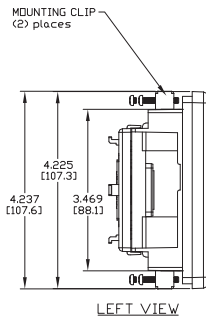
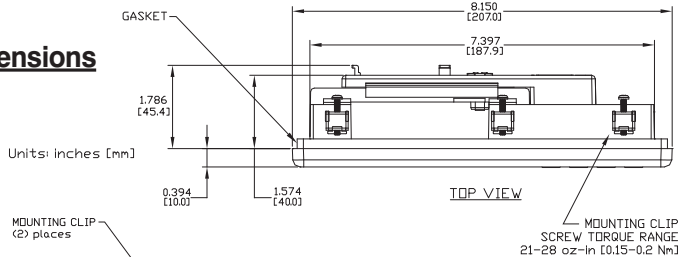
## 20-button Keypad Bezel

The 20-button keypad bezel can be used with both the touch and non-touch Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, a full numeric keypad, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object to allow changing of a value, and can also be used to navigate & select screen objects when using the non-touch panel version. The numeric buttons can be used to enter a new value, or use the cursor left and right buttons to select a digit and the cursor up and down buttons to change the value, along with the ENTER and CLEAR buttons. It can also be used to access and navigate the screen selector feature. The keypad bezel is designed for easy drop-in of a *C-more* Micro-Graphic panel. No panel configuration is required.

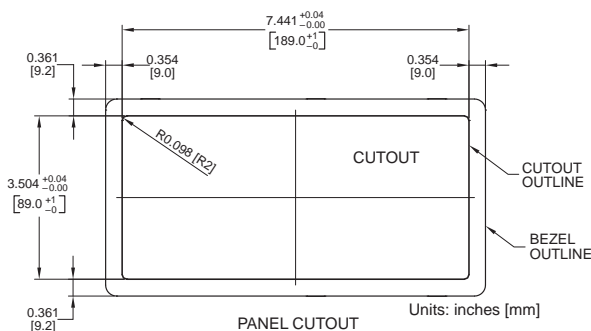
### EA-MG-BZ2



### Dimensions



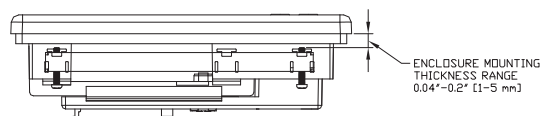
### Panel Cutout



Four directional  
cursor buttons,  
numeric buttons,  
and ESC, MENU,  
CLEAR and ENTER  
buttons.

**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

### Panel Thickness



20-Button Keypad Bezel continued at top of next page.



## 20-button Keypad Bezel (cont'd)

20-Button Keypad Bezel Specifications	
Part Number:	EA-MG-BZ2
General:	
• Micro-Graphic Panels Supported	EA1-S3ML, EA1-S3MLW, EA1-S3ML-N, EA1-S3MLW-N
• Connection	Connects with expansion connector on the rear of the <b>C-more</b> Micro-Graphic panel. An expansion connector is also on the rear of the keypad bezel to allow the EA-MG-P1 DC Power Adapter, or the EA-MG-SP1 Serial Port with DC Power Adapter to be attached.
• Power Consumption	None
• Keypad Button Life	Minimum of 500,000 cycles
• Enclosure Mounting	(6) mounting clips, EA-MG-BZ2-BRK, included. Note: The <b>C-more</b> Micro-Graphic panel is installed into the keypad bezel using the mounting clips, EA-MG-S3ML-BRK, that are supplied with the panel.
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	EMA ICS3-304 RFI, (145 MHz, 440 Mhz 10 W @ 10 cm) Impulse 1000 V @ 1 µs pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	8.150" (W) x 4.225" (H) x 2.180" (D) [207.0 mm x 107.3 mm x 55.4 mm]
• Weight	7.40 oz. [210 g]

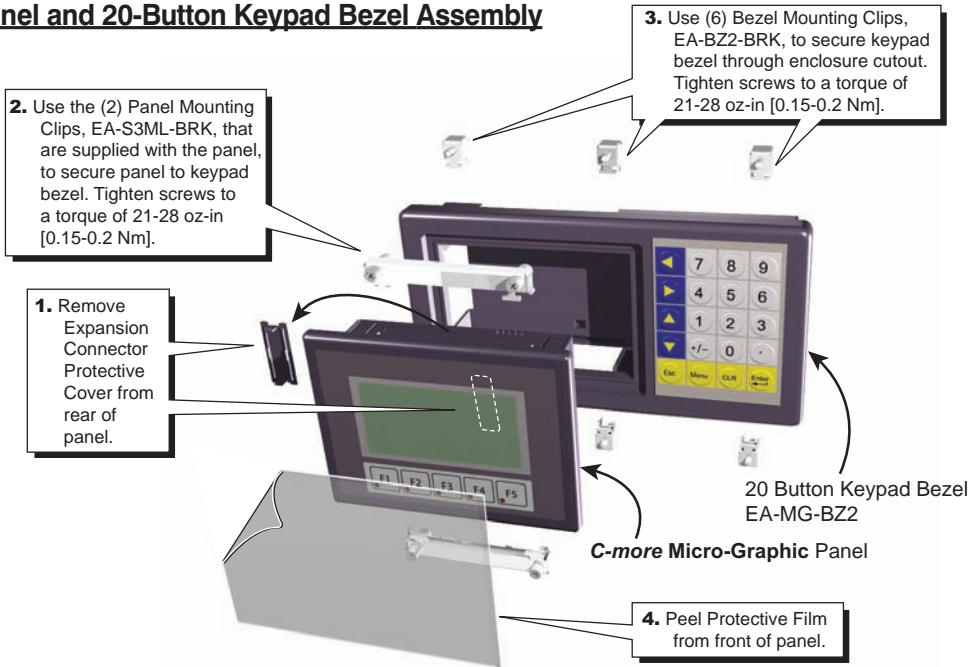
Micro-Graphic Panel being Installed  
in a 20-button Keypad Bezel EA-MG-BZ2



20-Button Keypad Bezel continued at top of next page.

## 20-button Keypad Bezel (cont'd)

### Panel and 20-Button Keypad Bezel Assembly



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

## DC Power Adapter

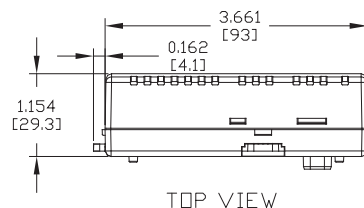
The *C-more* Micro-Graphic panel is designed to use the 5 VDC power that is available from an RJ12 serial communications port found on most *Direct*LOGIC PLCs from *AutomationDirect*. However, for other PLC brands that do not supply power through their serial communications port, the EA-MG-P1 DC power adapter or EA-MG-SP1 serial port with DC power adapter should be used. Both adapters require power from a 12-24 VDC source. The EA-MG-P1 DC Power Adapter for *C-more* Micro-Graphic panels is designed to easily snap on to the rear of a *C-more* Micro-Graphic panel or the rear of an optional Keypad Bezel being used with a Micro-Graphic panel.

### EA-MG-P1

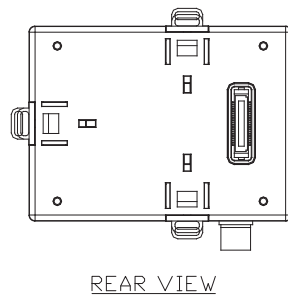
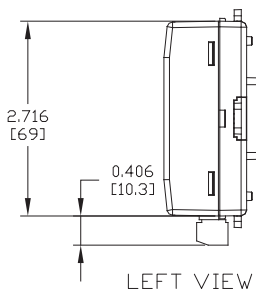
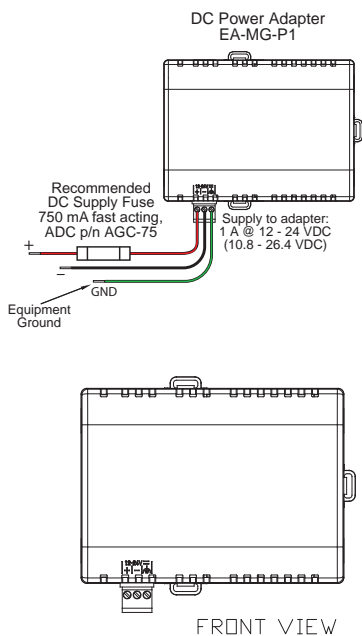


### Dimensions

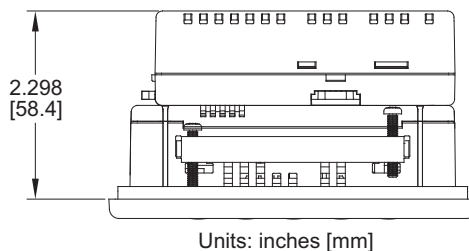
Units: inches [mm]



### Wiring Diagram



### Panel Overall Depth with Adapter Installed



**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

DC Power Adapter continued at top of next page.

## DC Power Adapter (cont'd)

DC Power Adapter Specifications	
Part Number:	EA-MG-P1
Electrical:	
• Input Voltage	12-24 VDC
• Input Voltage Range	10.8-26.4 VDC
• Power Consumption	100 mA at 24 VDC
• Maximum Power	2.90 Watts
• Maximum Inrush Current	5 A @ 500 $\mu$ s with 12 VDC applied, 10 A @ 500 $\mu$ s with 24 VDC applied
• Recommended Fuse	Type AGC fast acting glass fuse, 750 mA, 250 VAC, AGC p/n AGC-75
• Connector Type	3-pin screw type terminal block
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, sweeping, at a rate of 1 octave/min. ( $\pm 10\%$ ), 10 sweep cycles per axis on each of 3 mutually perpendicular axes
• Shock	IEC60068-2-27 (Test Ea), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	EMA ICS3-304 RFI, (145 MHz, 440 MHz 10 W @ 10 cm) Impulse 1000 V @ 1 $\mu$ s pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	3.823" (W) x 3.284" (H) x 1.331" (D) [97.1 mm x 83.4 mm x 33.8 mm]
• Weight	2.8 oz. [80 g]



**NOTE:** Recommended DC power supply to power either DC Power Adapter, **AutomationDirect** Part No. PSP24-024S or PSP24-024C.



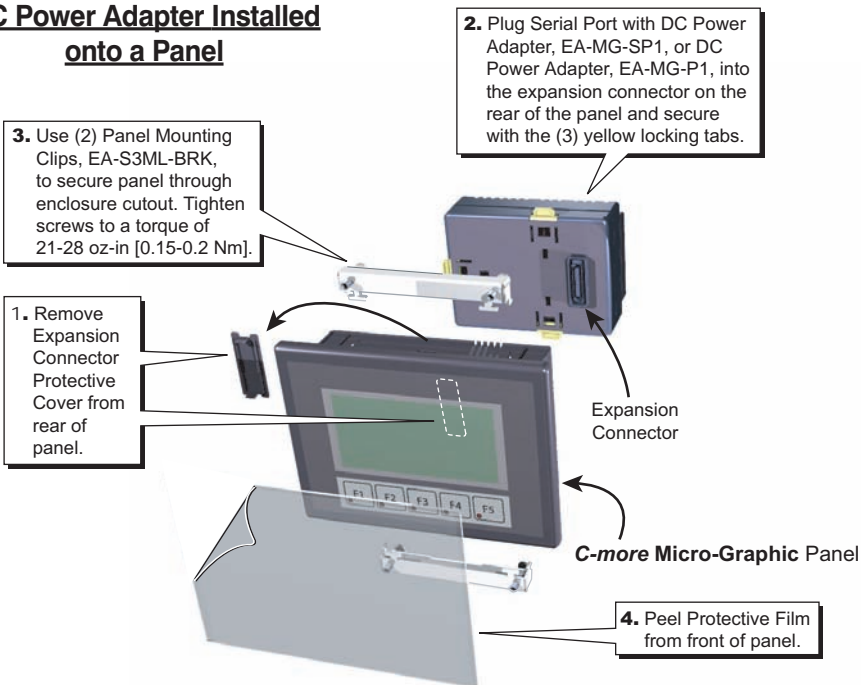
**NOTE:** If the adapter is installed on the panel, the adapter must be powered.

DC Power Adapter continued at top of next page.

## DC Power Adapter (cont'd)

### DC Power Adapter Installed onto a Panel

3

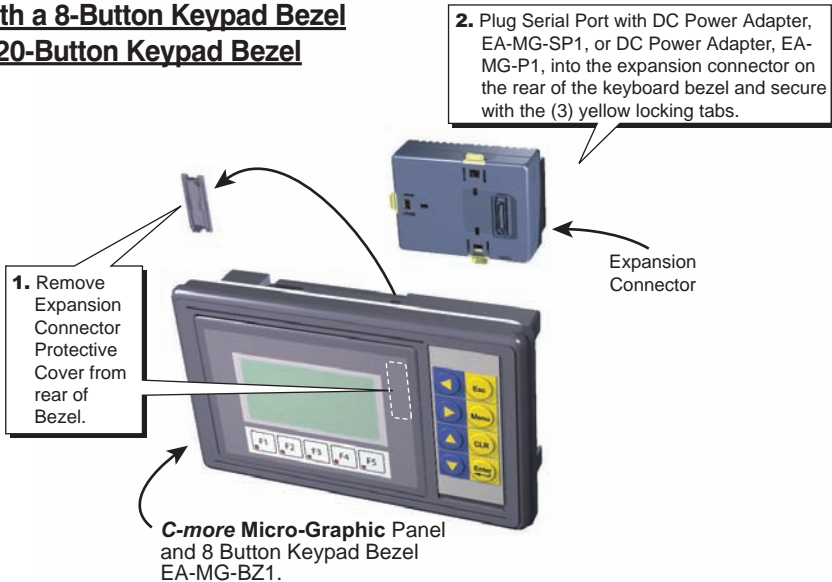


**NOTE:** Mounting clips for the panel are included with the panel.

DC Power Adapter continued at top of next page.

## DC Power Adapter (cont'd)

### DC Power Adapter Installed onto a Panel with a 8-Button Keypad Bezel or a 20-Button Keypad Bezel



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

## Serial Port with DC Power Adapter

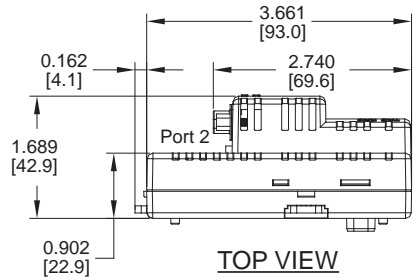
The *C-more* Micro-Graphic panel is designed to use the 5 VDC power that is available from an RJ12 serial communications port of most *DirectLOGIC* PLC from *AutomationDirect*. However, for other PLC brands that do not supply power through their serial communications port, the EA-MG-P1 DC power adapter or EA-MG-SP1 serial port with DC power adapter should be used. The EA-MG-SP1, with D-Sub 15-pin RS-232/RS-422/485 serial port, can be used to connect to a PLC using RS-232 or RS-422/485. The adapter requires power from a 12-24 VDC source. This optional Serial Port with DC Power Adapter for *C-more* Micro-Graphic panels is designed to easily snap on to the rear of a *C-more* Micro-Graphic panel or the rear of an optional Keypad Bezel being used with a Micro-Graphic panel.

### EA-MG-SP1



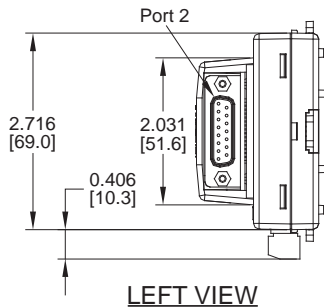
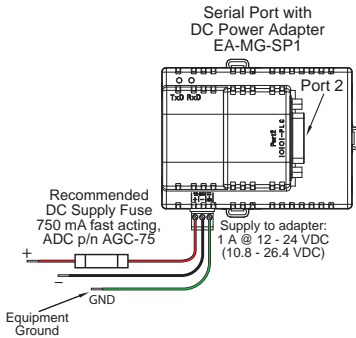
### Dimensions

Units: inches [mm]

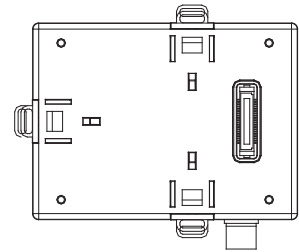


TOP VIEW

### Wiring Diagram

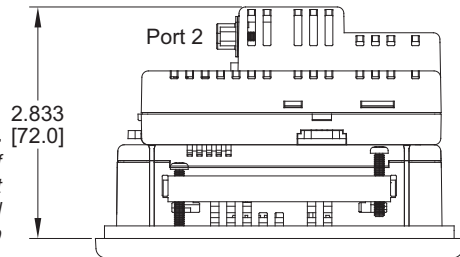


LEFT VIEW



REAR VIEW

### Panel Overall Depth with Adapter Installed



Units: inches [mm]

FRONT VIEW

**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

Serial Port with DC Power Adapter continued at top of next page.

## Serial Port with DC Power Adapter (cont'd)

Serial Port w/ DC Power Adapter Specifications	
Part Number:	EA-MG-SP1
Serial PLC Interface Port:	
• Interface Standard	RS232 & RS485/422
• Adjustable Settings from Software (Dependent on PLC Protocol)	Baud rate: 9600, 19200 or 38400 bits/sec Data bits: 7/8 bits Parity: None, Odd/Even Stop bits: 2/1 bits
• Connector Type	15-pin D-sub connector (female)
Electrical:	
• Input Voltage	12-24 VDC
• Input Voltage Range	10.8-26.4 VDC
• Power Consumption	100 mA at 24 VDC
• Maximum Power	2.90 Watts
• Maximum Inrush Current	5 A @ 500 $\mu$ s with 12 VDC applied, 10 A @ 500 $\mu$ s with 24 VDC applied
• Recommended Fuse	Type AGC fast acting glass fuse, 750 mA, 250 VAC, ADC p/n AGC-75
• Connector Type	3-pin screw type terminal block
Environmental:	
• Operating Temperature	0 to 50 °C (32 to 122 °F)
• Storage Temperature	-20 to 60 °C (-4 to 140 °F)
• Humidity	5 to 95 % RH (non-condensing)
• Environmental air	No corrosive gases permitted
• Vibration	IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, sweeping, at a rate of 1 octave/min. ( $\pm 10\%$ ), 10 sweep cycles per axis on each of 3 mutually perpendicular axes
• Shock	IEC60068-2-27 (Test Ea), 15 G peak, 11 ms duration, three shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)
• Noise Immunity	EMA ICS3-304 RFI, (145 MHz, 440 Mhz 10 W @ 10 cm) Impulse 1000 V @ 1 $\mu$ s pulse
• Enclosure	NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)
• Agency Approvals	CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382
Physical:	
• Dimensions	3.823" (W) x 3.284" (H) x 1.866" (D) [97.1 mm x 83.4 mm x 47.4 mm]
• Weight	4.375 oz. [125 g]



**NOTE:** Recommended DC power supply to power either DC Power Adapter, **AutomationDirect** Part No. PSP24-024S or PSP24-024C.



**NOTE:** If the DC power adapter is installed on the panel, the adapter must be powered.

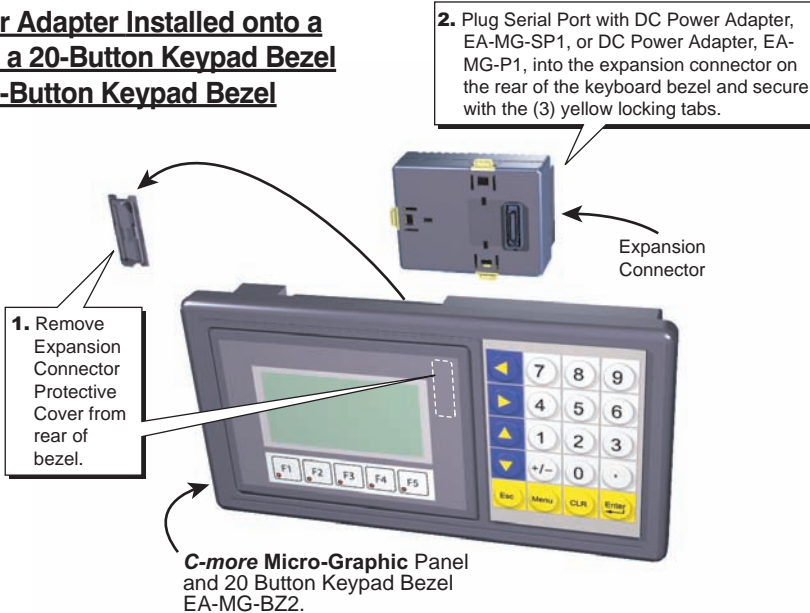
Serial Port with DC Power Adapter continued at top of next page.



# Serial Port with DC Power Adapter (cont'd)

## DC Power Adapter Installed onto a Panel with a 20-Button Keypad Bezel or a 8-Button Keypad Bezel

3



**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.



**NOTE:** When an EA-MG-SP1 Serial Port with DC Power Adapter is installed, **only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port 1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

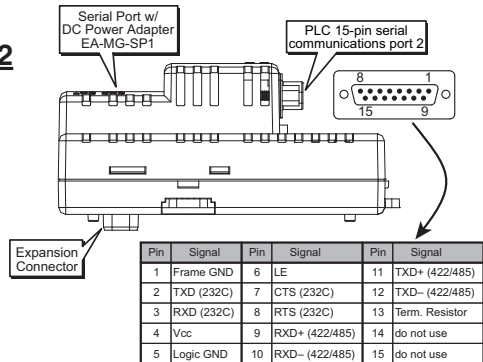
## Available PLC Protocols

## PLC Serial Communications Port 2

PLC Drivers	
Serial - port1 or port2	Serial - port2 only *
DirectLOGIC K-sequence	Allen-Bradley DF1 Half Duplex
DirectNET	Allen-Bradley DF1 Full Duplex
Modbus (Koyo Addressing)	Allen-Bradley PLC5 DF1
Modbus RTU	Allen-Bradley DH485
Entivity Modbus RTU	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
	Mitsubishi FX
	Omron Host Link (C200 Adapter, C500)
	Omron FINS Serial (CJ1, CS1)
	Siemens PPI (S7-200 CPU)

\*Note: Serial port2 requires the use of EA-MG-SP1 adapter

See the PLC Compatibility & Connection Charts in Chapter 6 for details

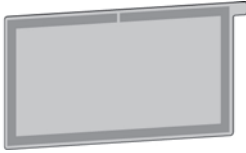


NOTE: Adapter requires 10.8-26.4 VDC supply.

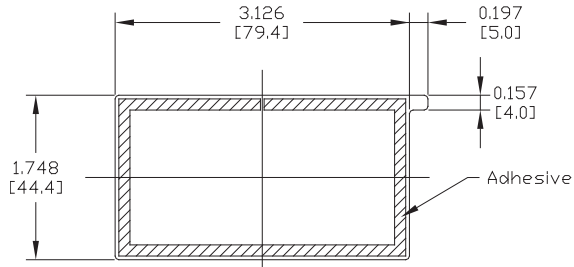
## Clear Screen Overlay

Optional clear screen overlay used to protect *C-more* Micro-Graphic displays from minor scratches and wear. Package contains 5 clear screen overlays.

### EA-MG-COV-CL



### Dimensions



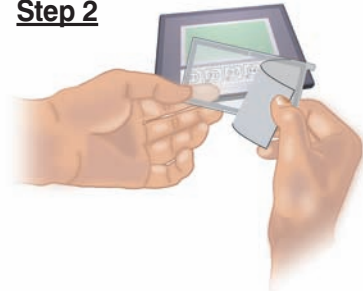
### Clear Screen Overlay Installation

#### Step 1



Remove the overlay from the package

#### Step 2



Remove the paper backing from the overlay

#### Step 3



Align the overlay with the screen and press the adhesive firmly into place

#### Step 4



Remove the protective film\*



\*NOTE: The overlay cover ships with a thin protective film on the face that should be carefully removed after installation.

# INSTALLATION & WIRING

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## CHAPTER 4

### In This Chapter...

Safety Guidelines .....	4-2
Introduction .....	4-3
Panel Cutout Dimensions (all models) .....	4-4
Wiring Guidelines .....	4-5

# 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 Web site: <http://www.automationdirect.com>*

4



**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 *C-more*® Micro-Graphic panels require selecting an appropriate location for the panel, laying out the cutout dimensions on the surface of the control cabinet that the panel will be mounted through, securing the panel with the provided mounting clips, tightening the screws to the appropriate torque rating to assure the gasket is sealing correctly, and finally connecting the appropriate power source to the panel.



**Note:** Each *C-more* Micro-Graphic panel is provided with a cutout template to make marking the proper cutout size on the surface of the control cabinet that the panel will be mounted through a simple task. The keypad bezels are also provided with an appropriate cutout template for mounting convenience.

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The *C-more* Micro-Graphic panels include two mounting clips. The clip is a long metal bracket with two screws. It is fitted to the panel by inserting two tabs into mating slots on the panel and then sliding the clip into a narrower slot to secure it in place.

If using the panel with either the 8-button or 20-button Keypad Bezel, then install the panel into the keypad bezel and secure with the mounting clips that are provided with the panel. Create a cutout in the enclosure that the assembled panel and keypad bezel will be mounted through and secure the assembly with the mounting clips that are provided with the keypad bezel. See **Chapter 3: Accessories** for additional details.

This chapter only covers the proper mounting of the panel and connecting power. Once power is applied to the panel, read **Chapter 5, System Setup Screens**, to check the information menu to make sure the panel has the latest version of firmware, become familiar with the panel test features, and check the memory usage.

The next step will be to select the appropriate PLC protocol and communications cable as described in **Chapter 6**.

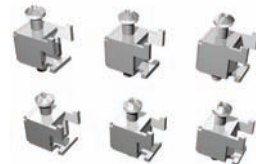
### Panel Mounting Clips EA-MG-S3ML-BRK



### 8-Button Keypad Bezel Mounting Clips EA-MG-BZ1-BRK

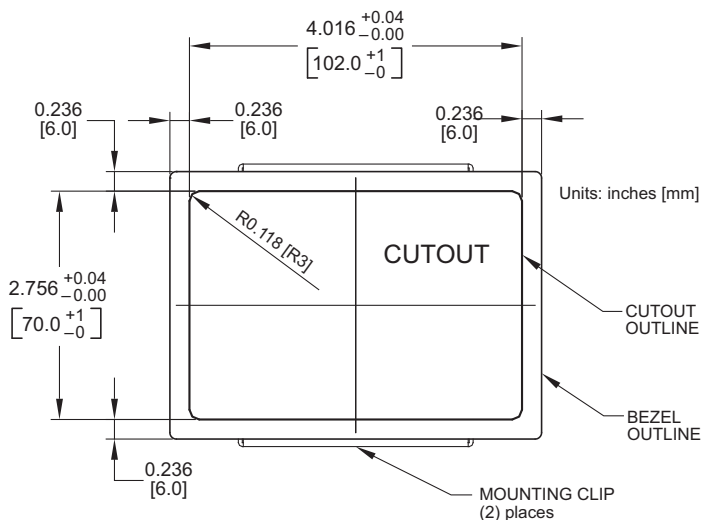


### 20-Button Keypad Bezel Mounting Clips EA-MG-BZ2-BRK

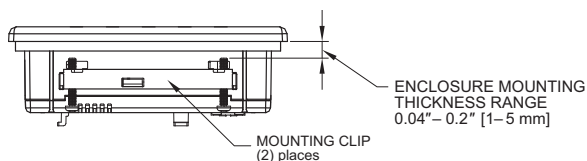


## Panel Cutout Dimensions (all models)

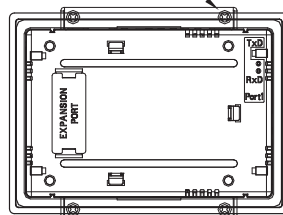
The *C-more* Micro-Graphic panel is mounted into a cutout through the control cabinet and secured with two (2) mounting clips. The mounting clips are provided with the panel. There is a set of two (2) “T” shaped holes (slots) on each side of the panel’s long dimension that the two tabs on each mounting clip will match. The mounting clips are held in place by inserting the tabs into the “T” shaped holes (slots) and then moving the mounting clip toward the rear of the panel to keep it in place. Next tighten the mounting clip screws to pull the rear of the panel’s bezel to the control cabinet’s mounting surface. The screws need to be tightened to the torque rating shown in the illustration below so that the gasket is compressed to form the proper seal between the panel and cabinet surface.



### Enclosure Mounting Thickness Ranges and Mounting Bracket Screw Torque



MOUNTING CLIP SCREW TORQUE RANGE 21-28 oz-in [0.15-0.2 Nm]



**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

## 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.

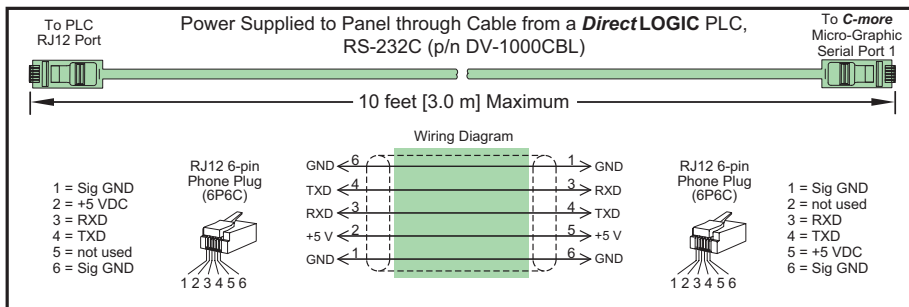
If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call us at 1-800-633-0405 or 770-844-4200.

This publication is based on information that was available at the time it was printed. At Automationdirect.com® we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without obligation. This publication may also discuss features that may not be available in certain revisions of the product.

### Providing Power to the Micro-Graphic Panel

- The *C-more* Micro-Graphic panel is powered during programming from the PC through the USB to RS-232 Programming Cable Assembly, EA-MG-PGM-CBL.
- During operation, the *C-more* Micro-Graphic panel can be powered from most *AutomationDirect* *Direct*LOGIC PLC's RJ12 serial communications port by using a DV-1000CBL communications cable, or a DV-1000CBL communications cable with a FA-15HD 15-pin HD DSub/RJ12 Adapter connected to a *Direct*LOGIC PLC's 15-pin HD communications port (DL06, D2-250-1 & D2-260) PLCs. See Chapter 6: PLC Communications for additional details.
- The panel can also be powered by installing either the EA-MG-P1 DC Power Adapter, or the EA-MG-SP1 Serial Port with DC Power Adapter to the back of the panel and supply the adapter from a 1 Amp @ 12-24 VDC power source.

### Panel Powered from *Direct*LOGIC PLC via Communications Cable

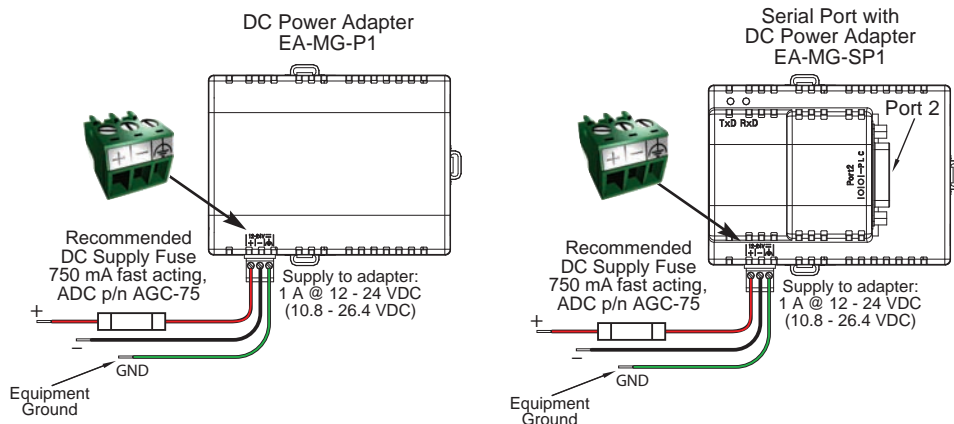


**NOTE:** Maximum cable length when the panel is powered via a *Direct*LOGIC PLC is 10 feet.

Wiring Guidelines continued at top of the next page.

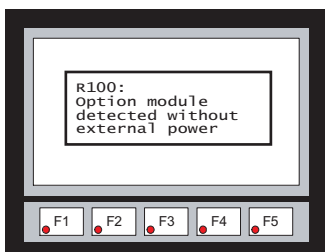
## Wiring Guidelines (cont'd)

### Panel Powered from a DC Power Adapter – Wiring Diagrams



**NOTE:** Recommended DC power supply to power either DC Power Adapter, **AutomationDirect** Part No. PSP24-024S or PSP24-024C.

**NOTE:** If either the EA-MG-P1 DC Power Adapter or the EA-MG-SP1 Serial Port with DC Power Adapter is installed on the Micro-Graphic panel, then the adapter must be powered. The error message below will be displayed on the panel if power is not applied. The RJ12 serial communications port (Port 1) on the panel can still be used to communicate with a PLC or control device while using one of the adapters, but the +5 VDC power through the serial cable from a **DirectLOGIC** PLC's RJ12 serial comm port is not used.

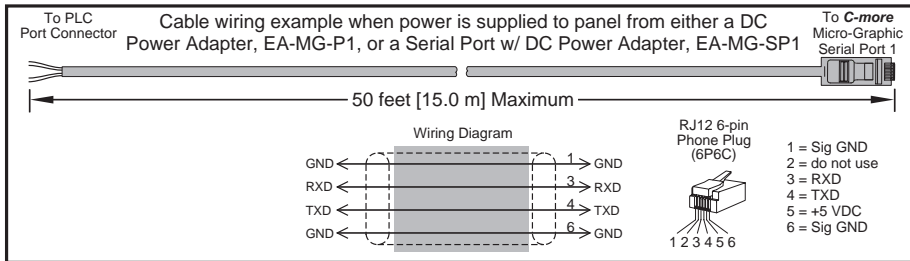


Wiring Guidelines continued at top of the next page.



## Wiring Guidelines (cont'd)

### Maximum communication cable length when powered from optional DC Power Adapter



# SYSTEM SETUP SCREENS

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## In This Chapter...

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# Introduction

The *C-more*<sup>®</sup> Micro-Graphic panels include a series of built-in **System Setup Screens** that allow the user to view detailed information about the panel, adjust features, test various functions of the panel, clear memory, and reset all values and conditions back to the original factory defaults.

The following is presented to give the user a detailed step by step look at:

- How to access the System Setup Screens
- What adjustments and features are available
- When and why the feature may need to be adjusted or used
- How to adjust and/or interrupt the features

The System Setup Screens from the Setup Menu are split into three different categories to make it simple for the user to select the area for viewing information, making adjustments, or testing the panel. The three Setup Menu selections are:

## Information

Here you will find detailed information in regards to the panel's available memory and usage, the protocol being used by the panel, if any optional extension, such as a keypad bezel and/or DC power adapter is installed on the panel, and version information for the firmware and boot loader.

## Setting

This is the area for adjusting the contrast of the display, selecting one of the five backlight colors enabling or disabling the internal audible beeper, calibrating the touch panel, clearing the user memory, resetting all of the settings back to the factory defaults, and setting the loading screen hourglass icon delay time or disabling the display of the hourglass icon. The factory defaults are a contrast value of 3, a green backlight, the internal audible beeper enabled, forced touch panel calibration on the touch panel version, user program cleared from memory, and hourglass icon delay of 350 ms.

## Test Menu

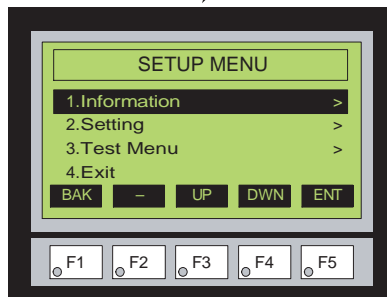
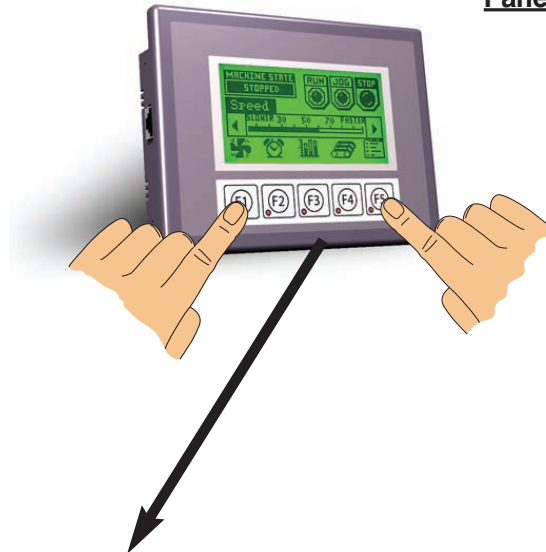
The test menu includes the ability to test the built-in serial port (Port 1 – RS-232) of the panel using a loop back connector, do an enquiry to determine if a PLC is connected, perform a test of the internal audible beeper and test the response of the touch screen surface on touch screen models. Refer to page 14 and 15 of this chapter for details on loop back connector wiring. If the EA-MG-SP1 Serial Port with DC Power Adapter (Port 2 – RS-232/485/422) is installed, the adapter will be detected and the ability to test this additional port using loop back connectors for RS-232 and RS-485/422 will be shown on the test menu.

## Accessing the System Setup Screens

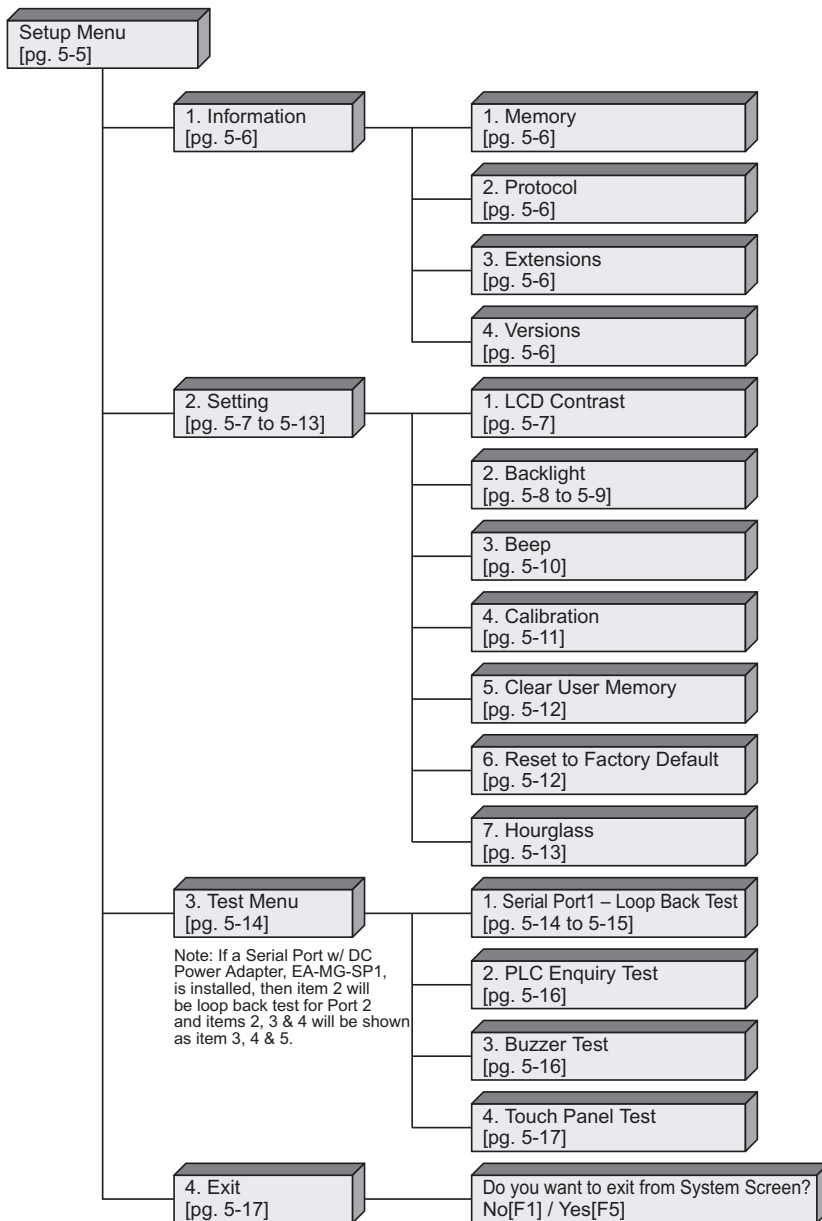
To access the **Setup Menu** of the panel **System Setup Screens**, press the panel's F1 and F5 function keys simultaneously for three (3) seconds as shown below. The **System Setup Screens' Setup Menu** will be displayed as shown at the bottom of this page.

Press both the F1 and F5 function keys simultaneously for 3 seconds to bring up the System Setup Screens' Setup Menu.

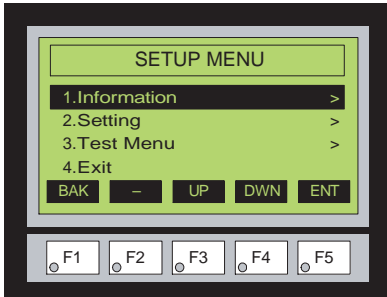
**C-more  
Micro-Graphic  
Panel**



# System Setup Screens Flowchart

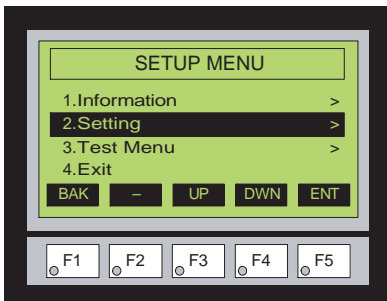


## Setup Menu

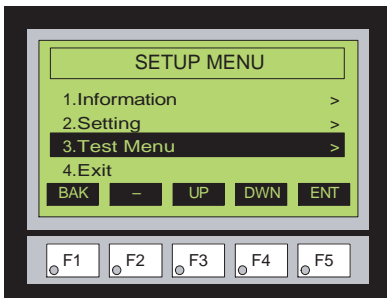


To navigate the different selections under the Setup Menu, use the function keys. [F1] to return to the project screen or previous screen, [F3] to cursor up, [F4] to cursor down, and [F5] to enter a selection.

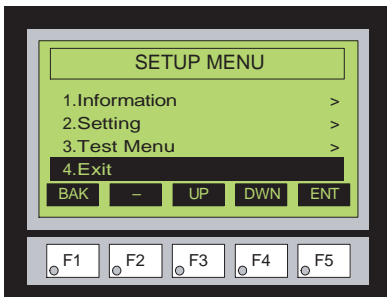
Pressing ENT [F5] with **Information** highlighted will take you to the **Information** menu screen. See page 5-6.



Pressing ENT [F5] with **Setting** highlighted will take you to the **Setting** menu screen. See page 5-7.

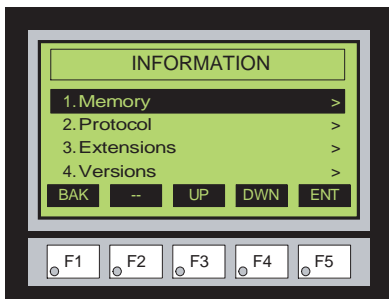


Pressing ENT [F5] with **Test Menu** highlighted will take you to the **Test Menu** screen. See page 5-12.

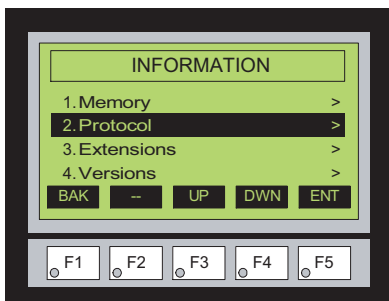
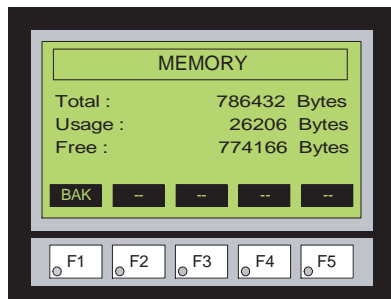


Pressing ENT [F5] with **Exit** highlighted will allow the user to decide whether to **Exit** or not **Exit** the System Setup Screens. See page 5-15.

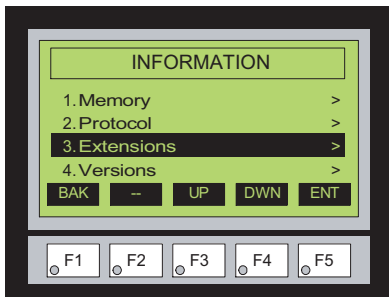
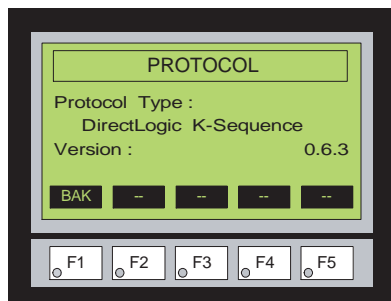
## Information Menu



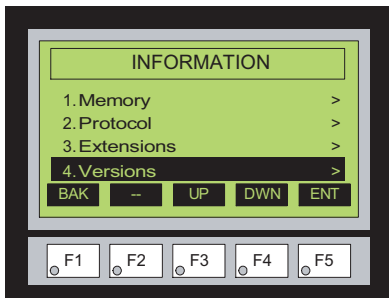
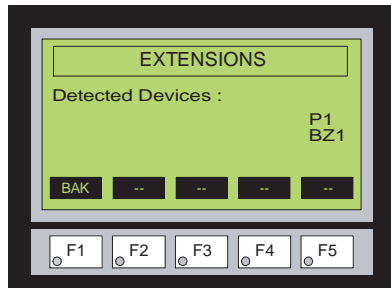
Pressing ENT [F5] with **Memory** highlighted will show the total memory available, memory usage and free memory available for the project.



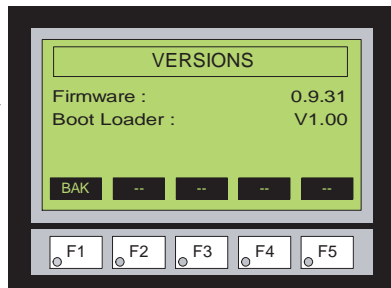
Pressing ENT [F5] with the **Protocol** highlighted will show the PLC Protocol that has been assigned to the panel and the protocol version.



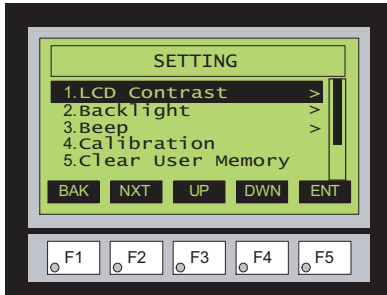
Pressing ENT [F5] with the **Extensions** highlighted will list the optional keypad bezel and/or DC power adapter that are installed on the panel. The example here shows the EA-MG-P1 & EA-MG-BZ1.



Pressing ENT [F5] with the **Versions** highlighted will show the panel's firmware and boot loader versions.



## Setting Menu



Use the UP [F3] and DWN [F4] function keys to scroll through the list of settings. There are five selections on the first screen and additional selections on a second screen. You can also use the NXT [F2] function key to go back and forth between the two screens without having to use the up and down keys. The BAK [F1] function key will return you to the previous screen. Use the ENT [F5] function key to make your selection once you have the setting highlighted.

The **Setting** screen includes the following:

**LCD Contrast** - page 5-7

**Backlight** – page 5-8

**Beep** – page 5-9

**Calibration** – page 5-10

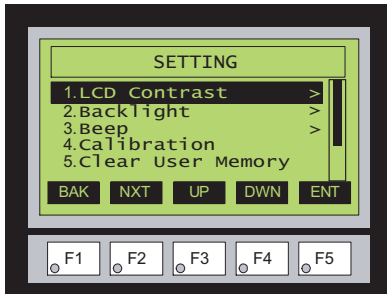
**Clear User Memory** – page 5-11

**Reset to Factory Default** – page 5-11

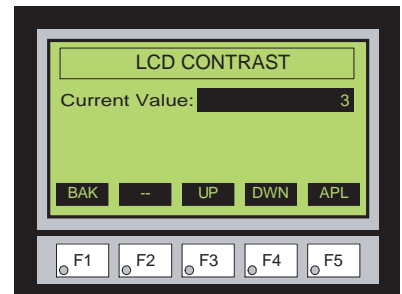
**Hourglass** – page 5-13



## Setting – LCD Contrast

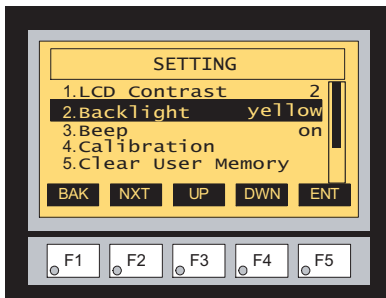


With **LCD Contrast** highlighted, press ENT [F5] to bring up the screen showing the current value. The default is a value of 3. The contrast can be adjusted between 1 to 5, with 1 being the least amount of contrast and 5 being the highest amount.

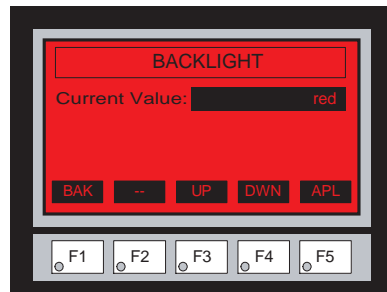
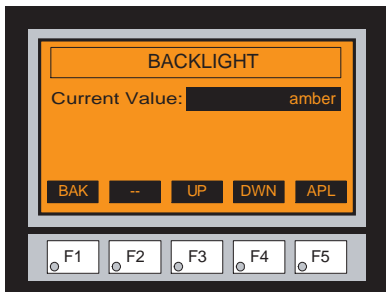
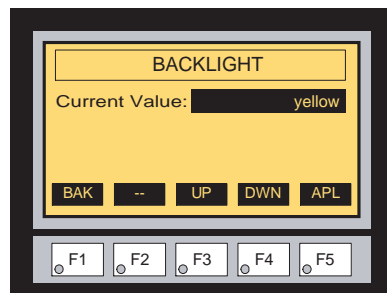
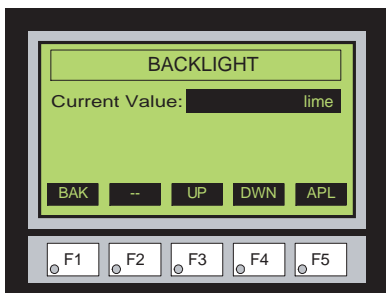
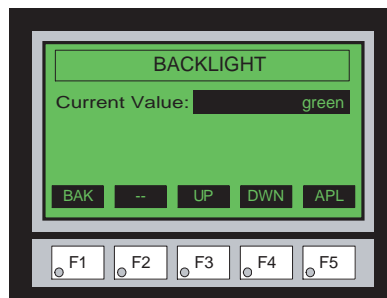




## Setting – Backlight, Models EA1-S3ML & EA1-S3ML-N

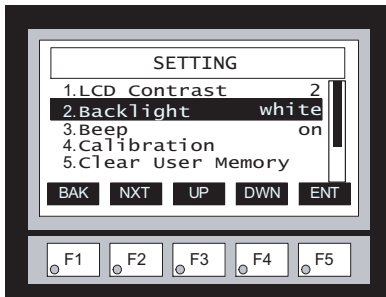


With Backlight highlighted, press ENT [F5] to bring up the screen showing the current backlight screen color. The default is green. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (green, lime, yellow, amber and red). Use the APL [F5] function key to apply the new color. Shown here are the various backlight colors.

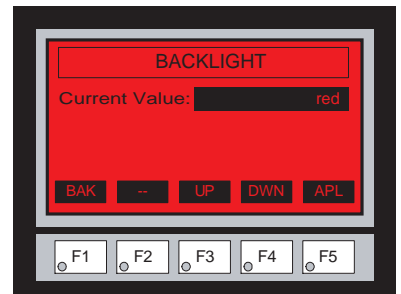
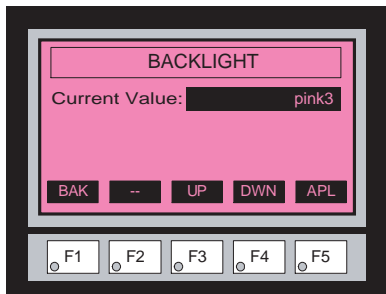
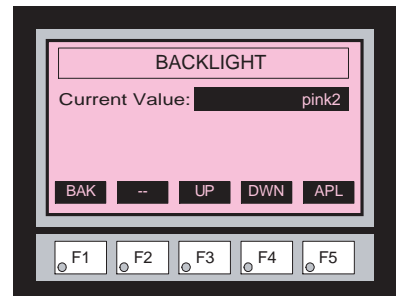
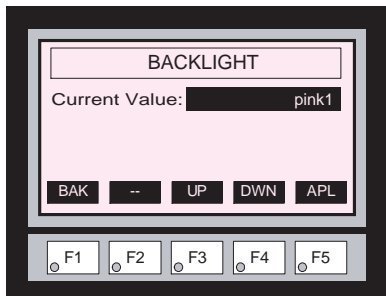
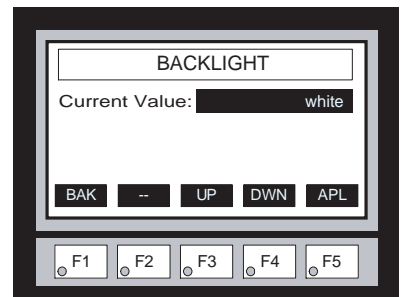


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

## Setting – Backlight, Models EA1-S3MLW & EA1-S3MLW-N

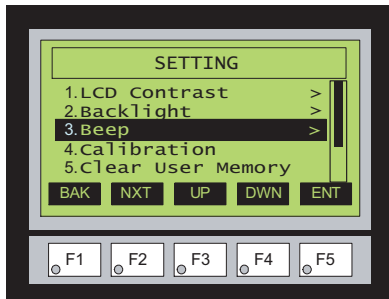


With Backlight highlighted, press ENT [F5] to bring up the screen showing the current backlight screen color. The default is white. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (white, pink1, pink2, pink3 and red). Use the APL [F5] function key to apply the new color. Shown here are the various backlight colors.

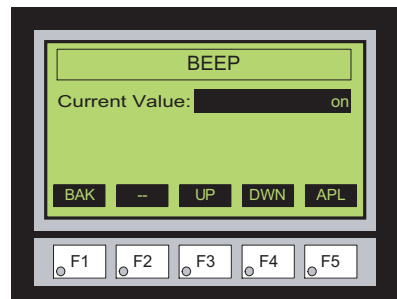


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

## Setting – Beep

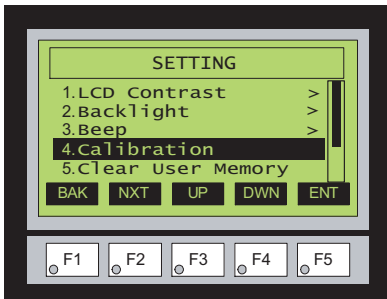


With Beep highlighted, press ENT [F5] to show the current value for the internal beeper. The default is ON. The UP [F3] and DWN [F4] function keys can be used to toggle between the ON and OFF state for the beeper (enable or disable). Use the APL [F5] function key to apply the selection.

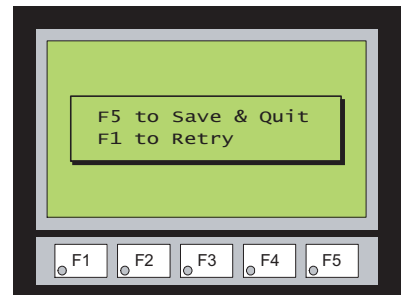
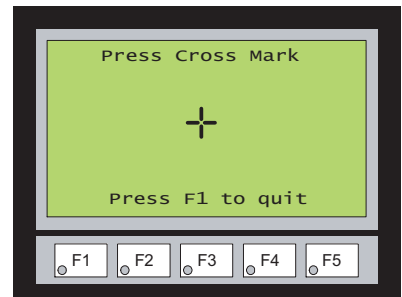


**Note:** Loading a project to the panel will override whatever selection is chosen for the beeper from the System Setup Screens' Beep on/off selection screen. The Beep on/off choice can be changed through the System Setup Screens after a project is loaded.

## Setting – Calibration

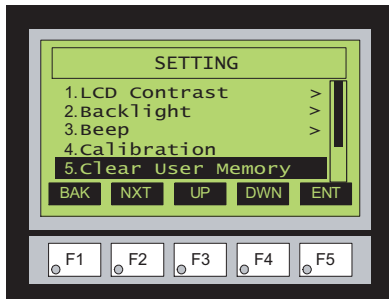


With Calibration highlighted, press ENT [F5] to bring up the first calibration screen as shown on the right. Touch the “cross” in the upper left corner as accurately as you can. When the screen is touched, the cross will move to the lower right corner and finally to the center of the screen. If the touch points are within the built-in calibration tolerance, the final screen will allow you to either save and quit from the calibration procedure, or allow you to retry. If the points that were touched are not within the calibration tolerance, you will be returned to the first calibration screen and will need to start over.

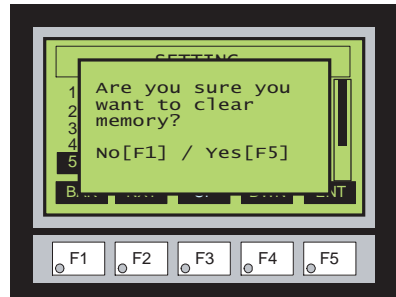


5

## Setting – Clear User Memory



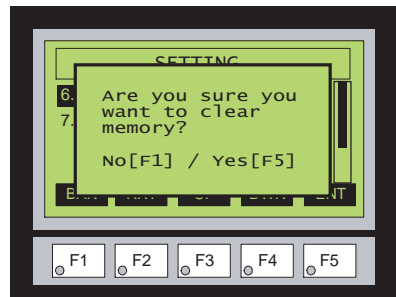
With Clear User Memory highlighted, press ENT [F5]. You will be given the choice to either proceed with clearing the user memory by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO.



## Setting – Reset to Factory Default



With Reset to Factory Default highlighted, press ENT [F5]. Press [F5] to restore all settings to factory defaults and clear user memory. Press [F1] to cancel.



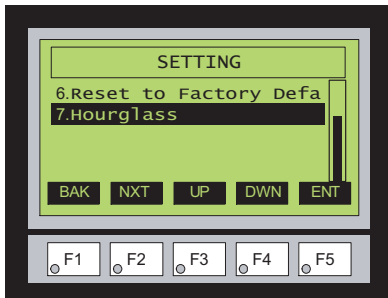
The Factory Default values are:

- LCD Contrast value of 3
  - Green backlight color for EA1-S3ML & EA1-S3ML-N
  - White backlight color for EA1-S6MLW & EA1-S3MLW-N
- The internal audible beeper enabled
- Forced touch panel calibration on the touch panel version
- User program cleared from memory
- Hourglass icon delay of 350 ms.



**NOTE:** User memory is cleared when factory defaults are reset. Use the C-more Micro programming software to read the project from the panel and save a backup copy.

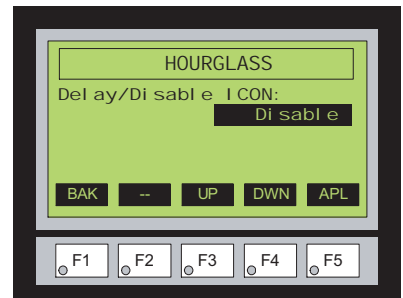
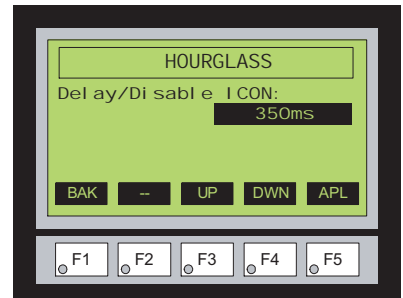
## Setting – Hourglass



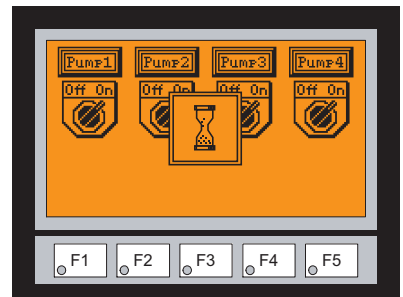
The **Hourglass** selection listed under the **Setting** menu can be used to either disable the display of the hourglass icon or set the amount of delay time (0 ms to 1000 ms) desired before it is displayed.

With **Hourglass** highlighted, press ENT [F5]. The UP [F3] and DWN [F4] function keys are used to scroll through the selections. Use the APL [F5] function key to apply the selection.

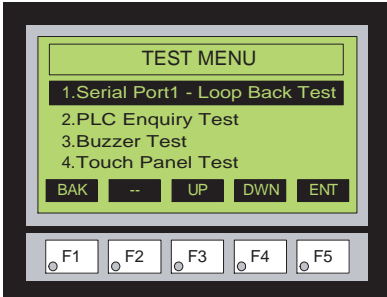
**Explanation:** An hourglass icon is displayed on the panel anytime a new screen is being loaded until communication is established with the new screen. If communication is established before the set delay time has timed out, no hourglass will be displayed. The hourglass icon can also be disabled from being displayed.



### Hourglass Icon



## Test Menu



Use the UP [F3] and DWN [F4] function keys to scroll through the list of tests. There are normally three selections on the Test Menu screen. If the EA-MG-SP1 Serial Port with DC Power Adapter is installed, then Serial Port 2 becomes available to the panel, and this serial port can also be tested by the use of loop back connectors. The BAK [F1] function key will return you to the previous screen. Use the ENT [F5] function key to make your selection once you have the test highlighted.

The Test Menu screen includes the following:

Serial Port1 - Loop Back Test – page 5-13

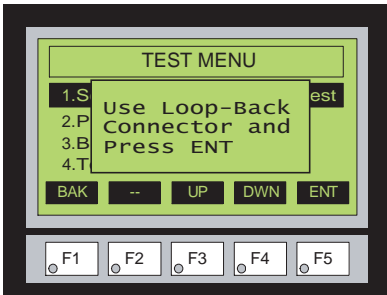
Serial Port2 - Loop Back Test – page 5-14

PLC Enquiry Test – page 5-15

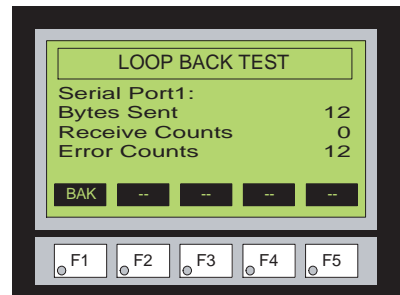
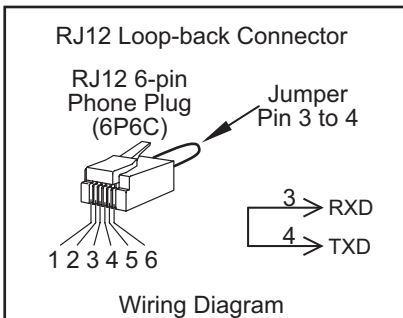
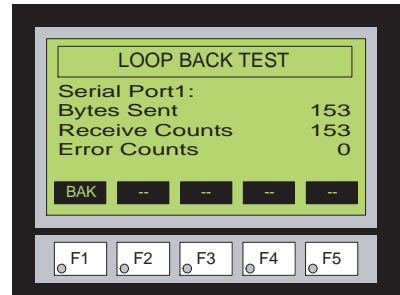
Buzzer Test – page 5-15

Touch Panel Test – page 5-17

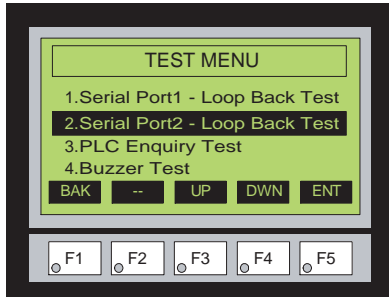
## Test Menu – Serial Port1 - Loop Back Test



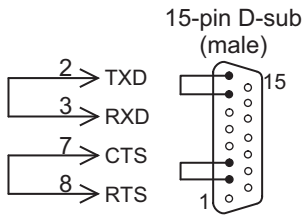
With Serial Port1 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the left. Connect a loop back connector constructed as shown here and press ENT [F5] to start the test. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not working, then the **Error Counts** will equal the **Bytes Sent**. The test will continue until the BAK [F1] key is pressed.



## Test Menu – Serial Port2 - Loop Back Test

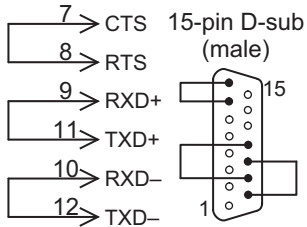


RS-232 Loop-back Connector



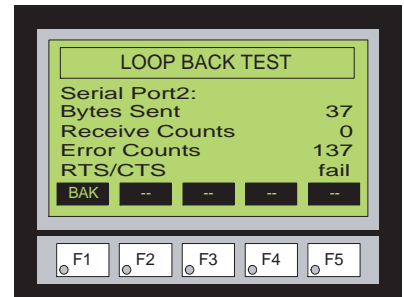
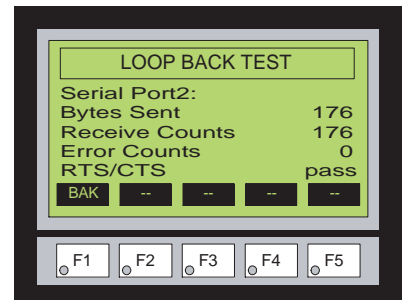
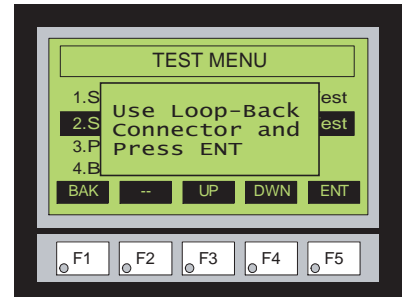
Wiring Diagram

RS-422/485 Loop-back Connector



Wiring Diagram

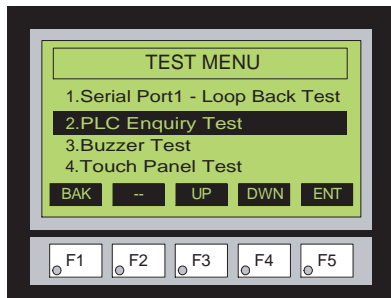
If the EA-MG-SP1 Serial Port with DC Power Adapter module is installed on the panel, then the screen to the left will be displayed when the Test Menu is brought up. With **Serial Port2 - Loop Back Test** selection highlighted, press ENT [F5] to bring up the screen shown to the right. At this point, either connect the RS-232 loop back connector or the RS-422/485 connector, depending on which type of communications connection is being used, and press ENT [F5] to start the test. Wiring diagrams for both types of loop back connectors are shown on this page. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not working, then the **Error Counts** will equal the **Bytes Sent**. The **RTS/CTS** signals will also show either **pass** or **fail** as shown to the right. The test will continue until the BAK [F1] key is pressed.



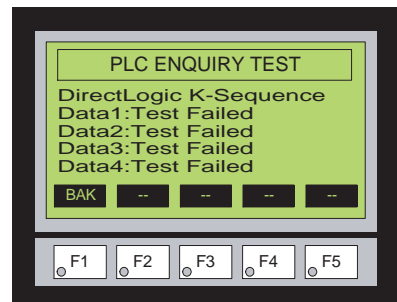
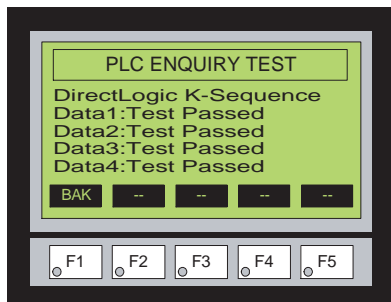
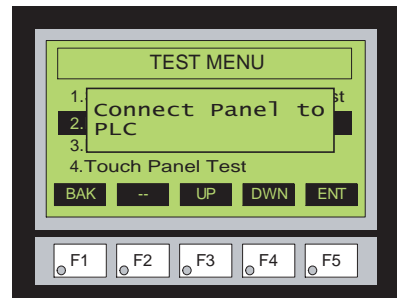


## Test Menu – PLC Enquiry Test

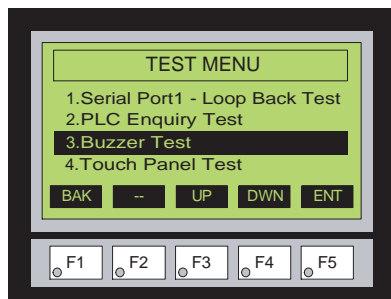
5



With PLC Enquiry Test highlighted, press ENT [F5] to bring up the screen shown to the right. If the PLC is connected to the panel, press ENT [F5] to start the test. Four data tests will be performed and indicated as either Test Passed or Test Failed as shown on this page. The BAK [F1] key can be pressed to cancel the test and/or returned to the previous screen.



## Test Menu – Buzzer Test

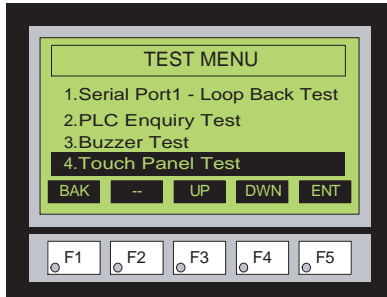


With Buzzer Test highlighted, press ENT [F5] to run the test on the internal audible beeper. The beeper will sequence up the scale through eight notes and then start over. The BAK [F1] key can be pressed to cancel the test.



**Note:** The beeper tone is not selectable. The beeper function can not be turned on or off from this screen, refer to the Setting menu.

## Test Menu – Touch Panel Test

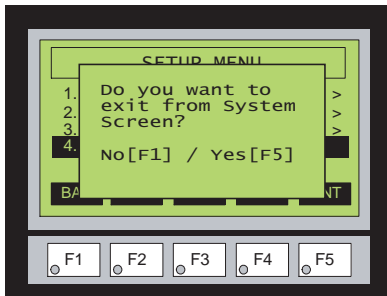


With Touch Panel Test highlighted, press ENT [F5] to bring up the screen shown to the right. Touch any area of the screen to visualize the active area of the touch screen. If the touch panel area is working properly, the screen will blacken at the area touched. Use this test to identify any area that is not responding properly. Press any key [F1 to F5] to return to the Test Menu.

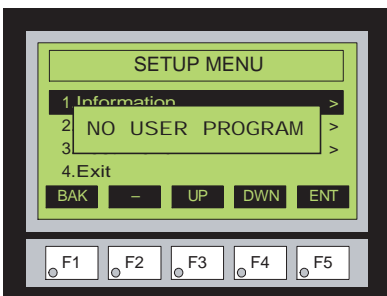


**Note:** The Touch Panel Test is available only on C-more Micro Graphic Touch panels (models EA1-S3ML and EA1-S3MLW).

## Exit



With Exit highlighted, press ENT [F5] to bring up the screen shown to the left. You will be given the choice to either proceed with exiting the **System Setup Screens** by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO. You will be returned to the project screen if answering YES.



If there is no user program loaded into the panel, then a **NO USER PROGRAM** message as shown to the left will be displayed.

# PLC COMMUNICATIONS

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# CHAPTER 6

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<b>Micro-Graphic Optional EA-MG-SP1 Port 2</b>	<b>6-4</b>
<b><i>Direct</i>LOGIC PLCs Password Protection</b>	<b>6-5</b>
<b>PLC Compatibility and Connection Charts</b>	<b>6-5</b>
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<b>Available Purchased Cables – Wiring Diagrams</b>	<b>6-22</b>
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Introduction

The *C-more*<sup>®</sup> Micro-Graphic panels are capable of communicating with the entire *Direct*LOGIC family of PLCs. The panel is capable of communicating using RS232, RS422 and RS485 serial communications and networks. When using the built in RJ12 serial port, designated as **Port 1**, on the *C-more* Micro-Graphic panel to connect with the DL05, DL06, DL105, DL205, D3-350 and DL405 CPUs, your cabling choices are fairly simple.

- DV-1000CBL – connects to DL05, DL06, DL105, DL205, D3-350 and D4-450 phone jack.
- D4-1000CBL – connects to all DL405 CPU 15-pin ports.

The panel also has the ability to communicate with Allen-Bradley PLCs that support the Allen-Bradley DF1 and DH485 protocols. Use of the Serial Port with DC Power Adapter module, EA-MG-SP1, along with the following cables will allow connecting the panel to a majority of Allen-Bradley PLCs.

- EA-MLOGIX-CBL – connects to AB MicroLogix 1000, 1100, 1200 & 1500
- EA-SLC-232-CBL – connects to AB SLC 5/03, /04, /05, ControlLogix, CompactLogix, FlexLogix
- EA-PLC5-232-CBL – connects to AB PLC5
- EA-DH485-CBL – connects to AB MicroLogix, SLC500, and any PLC using AB AIC device

The PLC Compatibility and Connection Chart tables on the following pages list all of the various PLCs and protocols that can be configured. Other third party PLCs include GE, Mitsubishi, Omron, Modicon and Siemens. The rest of this chapter is devoted to show the pin to pin connections of all the available cables plus wiring diagrams that the user can refer to in order to construct their own cables, along with wiring diagrams of cables that are not available for purchase.



**Note:** A maximum cable length of 10 feet between the Micro-Graphic panel and the PLC is recommended when powering the panel from the PLC.

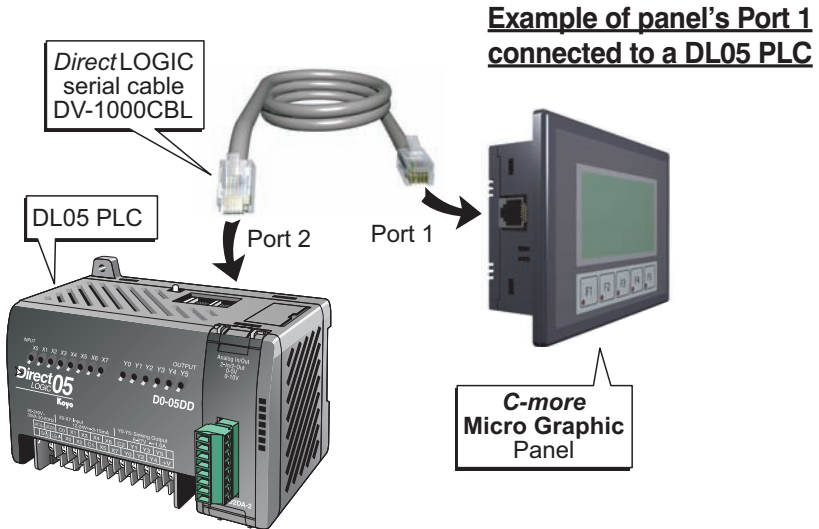
The Serial Port with DC Power Adapter module, EA-MG-SP1, can be used if the application requires the use of RS-422 or RS-485. The serial port on the adapter, designated as **Port 2**, can also be wired for RS-232. The use of the adapter permits greater cable lengths. The panel can also be connected to more than one PLC by using RS-422 or RS-485 wired in a multi-drop configuration. See the example wiring diagrams at the end of this chapter for details.

Available PLC Protocols

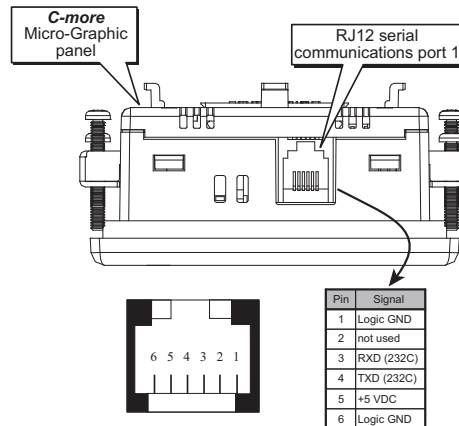
PLC Drivers	
Serial - port1 or port2	Serial - port2 only *
DirectLOGIC K-sequence	Allen-Bradley DF1 Half Duplex
DirectNET	Allen-Bradley DF1 Full Duplex
Modbus (Koyo Addressing)	Allen-Bradley PLC5 DF1
Modbus RTU	Allen-Bradley DH485
Entivity Modbus RTU	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
	Mitsubishi FX
	Omron Host Link (C200 Adapter, C500)
	Omron FINS Serial (CJ1, CS1)
	Siemens PPI (S7-200 CPU)
*Note: Serial port2 requires the use of EA-MG-SP1 adapter	

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

## Micro-Graphic Built-in Port 1

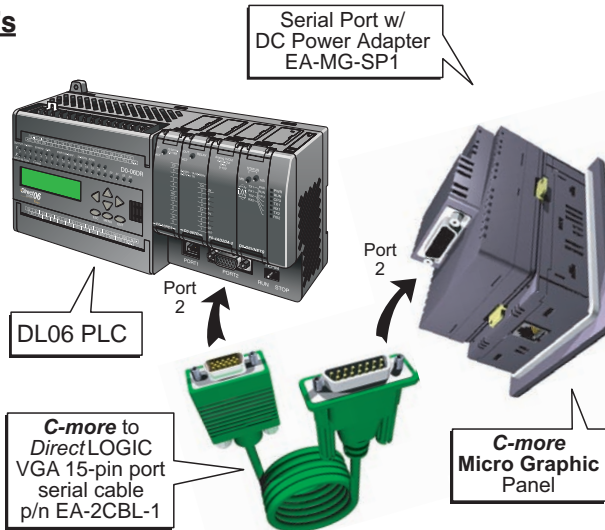


### Port 1 (built-in)

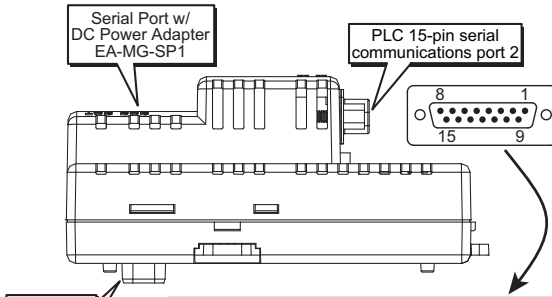


# Micro-Graphic Optional EA-MG-SP1 Port 2

## Example of panel's Optional Port 2 connected to a DL06 PLC



## Port 2 (optional)



Pin	Signal	Pin	Signal	Pin	Signal
1	Frame GND	6	LE	11	TXD+ (422/485)
2	TXD (232C)	7	CTS (232C)	12	TXD- (422/485)
3	RXD (232C)	8	RTS (232C)	13	Term. Resistor
4	Vcc	9	RXD+ (422/485)	14	do not use
5	Logic GND	10	RXD- (422/485)	15	do not use

NOTE: Adapter requires 10.8-26.4 VDC supply.

**NOTE:** If the DC power adapter is installed on the panel, the adapter must be powered.

**NOTE:** The panel has one built-in RJ12 serial communications port (Port 1 - RS-232) and the option to add one 15-pin serial communications port (Port 2 - RS-232/422/485) to the panel by installing the EA-MG-SP1 module. **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port 1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## DirectLOGIC PLCs Password Protection



**NOTE:** *DirectLOGIC 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 Compatibility and Connection Charts

The following charts list the possible connections available between the entire family of *DirectLOGIC* PLCs showing which PLC ports have the ability of communicating with the panel's built-in port (Port 1 – RS-232), while at the same time providing power to the panel; communicating from Port 1 while using the EA-MG-P1 DC Power Adapter module to provide power to the panel; using the optional EA-MG-SP1 Serial Port with DC Power Adapter (Port 2 – RS-232/485/422) module which provides communications and power; and also communicating with Port 1 while using the EA-MG-SP1 Serial Port with DC Power Adapter module to provide power.

The chart includes the various PLC protocols that can be used with each combination of PLC port and panel port.

The chart lists the recommended cables and/or manufactured devices that can be used to make up the communications link, and also refers to wiring diagrams that can be used to construct cables for connecting the PLC's port to the panel's port. The constructed cables are referred to as Diagram 1 through 6 and start on page 6-24.

Following the charts is a list of cables that can be purchased, including their wiring diagrams, and also wiring diagrams that are referenced from the charts that can be used to construct the referenced cables.

### **DirectLOGIC PLCs RS-422A/RS-485A:**

When using the RS-422A/RS-485A communications capabilities of the *C-more* Micro-Graphic EA-MG-SP1 Serial Port with DC Power Adapter (Port 2), the termination resistor is placed between the RXD– and RXD+ terminals on the PLC side of the connection between the *C-more* Micro-Graphic panel 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 (termination resistor) to pin 9 (RXD+) on the C-more 15-pin PLC communications port.

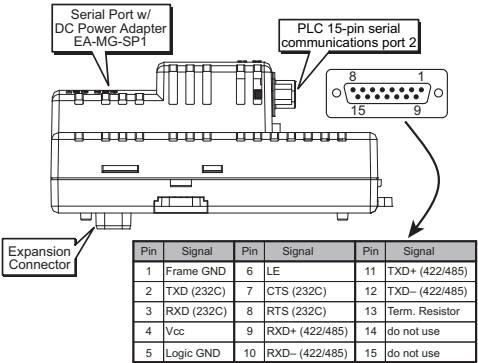
**Allen-Bradley:**

As stated in this chapter’s introduction, the panel also has the ability to communicate with Allen-Bradley PLCs that support the Allen-Bradley DF1 and DH485 protocols. Use of the Serial Port with DC Power Adapter module, EA-MG-SP1, is required. The chart for the various Allen-Bradley PLCs includes recommended cables.

**GE, Mitsubishi, Omron, Modicon and Siemens:**

Other 3rd party PLCs can be used with the *C-more* Micro-Graphic panel with the use of the Serial Port with DC Power Adapter module, EA-MG-SP1. These PLCs are listed in a chart and various wiring diagrams are shown to allow connectivity.

**PLC Serial  
Communications Port 2**



NOTE: Adapter requires 10.8-26.4 VDC supply.



## How to use the PLC Compatibility and Connection Charts

- 1.) Find the PLC Family being used.
- 2.) Find the particular PLC model in the PLC family.
- 3.) Find the PLC communications port you will be connecting to the *C-more* Micro-Graphic panel.
- 4.) Read across the chart to determine if the *C-more* Micro-Graphic panel's Port 1 can be used, or if an optional EA-MG-P1 DC Power Adapter or EA-MG-SP1 Serial Port w/ DC Power Adapter is required, and then determine the cable and other components, manufactured or user constructed, are required.

### Example:

Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
<b>DirectLOGIC DL205</b>	D2-230	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	DV-1000CBL RS-232
	D2-240	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	DV-1000CBL RS-232
		Port 2 RJ12 - 6 pin	K-sequence, <i>DirectNET</i>		K-sequence, <i>DirectNET</i>	
	D2-250-1	Port 1 RJ12 - 6 pin	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
	D2-260	Port 1 RJ12 - 6 pin	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232

## DirectLOGIC DL05, DL06, D0-DCM Module & DL105 PLCs

### Panel Powered via RJ12 Port 1 or EA-MG-P1, Port 1 Communications

PLC Compatibility &amp; Connection Chart

PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
		Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type	
DirectLOGIC DL05	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232
		Port 2 RJ12 - 6 pin				
	DO-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
DirectLOGIC DL06	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
	DO-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
DirectLOGIC DL105	all versions	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	DV-1000CBL RS-232

## DirectLOGIC DL05, DL06, D0-DCM Module & DL105 PLCs

### Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			Serial Port with DC Power Adapter			
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.			
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL05	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	EA-2CBL RS-232
		Port 2 RJ12 - 6 pin				
	D0-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)				EA-2CBL-1 RS-232
						* See Diagram 1 RS-422
Direct LOGICDL06	all versions	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)				EA-2CBL-1 RS-232
	* See Diagram 1 RS-422					
	D0-DCM	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <b>DirectNET</b> , Modbus RTU	* See Diagram 2 RS-485 Modbus only
						Port 2 DB15HD (female)
EA-2CBL-1 RS-232						
DirectLOGIC DL105	all versions	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	EA-2CBL RS-232
		Port 2 DB15HD (female)				

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

## DirectLOGIC DL205 PLCs, D2-DCM Module and WINPLC Panel Powered via RJ12 Port 1 or EA-MG-P1, Port 1 Communications

PLC Compatibility &amp; Connection Chart

PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL205	D2-230	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	DV-1000CBL RS-232
	D2-240	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	DV-1000CBL RS-232
		Port 2 RJ12 - 6 pin	K-sequence, <i>DirectNET</i>		K-sequence, <i>DirectNET</i>	
	D2-250-1	Port 1 RJ12 - 6 pin	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
	D2-260	Port 1 RJ12 - 6 pin	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		DV-1000CBL + FA-15HD RS-232
	D2-DCM	Port 1 DB 25 pin (female)	K-sequence, <i>DirectNET</i> , Modbus RTU	* See Diagram 3 RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	* See Diagram 3 RS-232
	WINPLC	Port 1 RJ12 - 6 pin	Modbus RTU	DV-1000CBL RS-232	Modbus RTU	DV-1000CBL RS-232

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

## DirectLOGIC DL205 PLCs, D2-DCM Module and WINPLC Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			Serial Port with DC Power Adapter			
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.			
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL205	D2-230	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	EA-2CBL RS-232
	D2-240	Port 1 RJ12 - 6 pin	K-sequence	DV-1000CBL RS-232	K-sequence	EA-2CBL RS-232
		Port 2 RJ12 - 6 pin	K-sequence, DirectNET		K-sequence, DirectNET	
	D2-250-1	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		EA-2CBL-1 RS-232
						* See Diagram 1 RS-422
	D2-260	Port 1 RJ12 - 6 pin	K-sequence, DirectNET, Modbus RTU	DV-1000CBL RS-232	K-sequence, DirectNET, Modbus RTU	EA-2CBL RS-232
		Port 2 DB15HD (female)		DV-1000CBL + FA-15HD RS-232		EA-2CBL-1 RS-232
					* See Diagram 1 RS-422	
	D2-DCM	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	* See Diagram 3 RS-232	DirectNET	EA-4CBL-2 RS-232
						* See Diagram 6 RS-422
	WINPLC	Port 1 RJ12 - 6 pin	Modbus RTU	DV-1000CBL RS-232	Modbus RTU	EA-2CBL RS-232

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

## DirectLOGIC DL305 PLCs and D3-DCM Module

## Panel Powered via RJ12 Port 1 or EA-MG-P1, Port 1 Communications

PLC Compatibility &amp; Connection Chart

PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL305	D3-330 or D3-340	D3-232-DCU DB 25 pin (female)	Not Possible		DirectNET	* See Diagram 3 RS-232
		D3-422-DCU DB 25 pin (female)	Not Possible		Not Possible	
	D3-340	Port 1 RJ11 - 4 pin	Not Possible		DirectNET	OP-3CBL-1 RS-232
		Port 2 RJ11 - 4 pin	Not Possible		DirectNET, Modbus RTU	
	D3-350	Port 1 RJ12 - 6 pin	K-sequence, DirectNET	DV-1000CBL RS-232	K-sequence, DirectNET	DV-1000CBL RS-232
		Port 2 DB 25 pin (female)	Not Possible		K-sequence, DirectNET, Modbus RTU	* See Diagram 3 RS-232
	D3-DCM D3-350 only	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	* See Diagram # RS-232	K-sequence, DirectNET, Modbus RTU	* See Diagram 3 RS-232
	* Note: Wiring Diagrams for user constructed cables start on page 6-31.					

## DirectLOGIC DL305 PLCs and D3-DCM Module

### Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart							
PLC			C-more Micro-Graphic Panel				
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.				
			Serial Port with DC Power Adapter				
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.				
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female		
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type	
<b>DirectLOGIC DL305</b>	D3-330 or D3-340	D3-232-DCU DB 25 pin (female)	<b>DirectNET</b>	<b>EA-4CBL-2</b> RS-232	<b>DirectNET</b>	<b>EA-4CBL-2</b> RS-232	
		D3-422-DCU DB 25 pin (female)	<b>Not Possible</b>		<b>DirectNET</b>	<b>* See Diagram 6</b> RS-422	
	D3-340	Port 1 RJ11 - 4 pin	<b>DirectNET</b>	<b>OP-3CBL-1</b> RS-232	<b>DirectNET</b>	<b>EA-3CBL</b> RS-232	
		Port 2 RJ11 - 4 pin	<b>DirectNET, Modbus RTU</b>		<b>DirectNET, Modbus RTU</b>		
	D3-350	Port 1 RJ12 - 6 pin	K-sequence, <b>DirectNET</b>	<b>DV-1000CBL</b> RS-232	K-sequence, <b>DirectNET</b>	<b>EA-2CBL</b> RS-232	
		Port 2 DB 25 pin (female)	K-sequence, <b>DirectNET, Modbus RTU</b>	<b>* See Diagram 3</b> RS-232	K-sequence, <b>DirectNET, Modbus RTU</b>	<b>EA-4CBL-2</b> RS-232 <b>* See Diagram 4</b> RS-422	
	D3-DCM D3-350 only	Port 1 DB 25 pin (female)	K-sequence, <b>DirectNET, Modbus RTU</b>	<b>* See Diagram 3</b> RS-232	<b>DirectNET</b>	<b>EA-4CBL-2</b> RS-232 <b>* See Diagram 6</b> RS-422	

**\* Note: Wiring Diagrams for user constructed cables start on page 6-31.**

## DirectLOGIC DL405 PLCs and D4-DCM Module

## Panel Powered via RJ12 Port 1 or EA-MG-P1, Port 1 Communications

PLC Compatibility &amp; Connection Chart

PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL405	D4-430	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232
		Port 1 DB 25 pin (female)	Not Possible		K-sequence, <i>DirectNET</i>	DV-1000CBL & FA-CABKIT RS-232
	D4-440	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232
		Port 1 DB 25 pin (female)	Not Possible		K-sequence, <i>DirectNET</i>	DV-1000CBL & FA-CABKIT RS-232
	D4-450	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232
		Port 1 DB 25 pin (female)	Not Possible		K-sequence, <i>DirectNET</i> , Modbus RTU	DV-1000CBL & FA-CABKIT RS-232
		Port 3 DB 25 pin (female)	Not Possible		Not Possible	
		Port 2 RJ12 - 6 pin	K-sequence, <i>DirectNET</i>	DV-1000CBL RS-232	K-sequence, <i>DirectNET</i>	DV-1000CBL RS-232
	D4-DCM	Port 1 DB 25 pin (female)	K-sequence, <i>DirectNET</i> , Modbus RTU	* See Diagram 3 RS-232	K-sequence, <i>DirectNET</i> , Modbus RTU	* See Diagram 3 RS-232

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.



## DirectLOGIC DL405 PLCs and D4-DCM Module Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			Serial Port with DC Power Adapter			
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.			
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
DirectLOGIC DL405	D4-430	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET	DV-1000CBL & FA-CABKIT RS-232	K-sequence, DirectNET	EA-4CBL-2 RS-232 * See Diagram 4 RS-422
	D4-440	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET	DV-1000CBL & FA-CABKIT RS-232	K-sequence, DirectNET	EA-4CBL-2 RS-232 * See Diagram 4 RS-422
	D4-450	Port 0 DB 15 pin (female)	K-sequence	D4-1000CBL or DV-1000CBL & FA-CABKIT RS-232	K-sequence	EA-4CBL-1 RS-232
		Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	DV-1000CBL & FA-CABKIT RS-232	K-sequence, DirectNET, Modbus RTU	EA-4CBL-2 RS-232 * See Duagram 4 RS-422
		Port 3 DB 25 pin (female)	Not Possible		K-sequence, DirectNET, Modbus RTU	* See Diagram 5 RS-422
		Port 2 RJ12 - 6 pin	K-sequence, DirectNET	DV-1000CBL RS-232	K-sequence, DirectNET	EA-2CBL RS-232
	D4-DCM	Port 1 DB 25 pin (female)	K-sequence, DirectNET, Modbus RTU	* See Diagram 3 RS-232	DirectNET	EA-4CBL-2 RS-232 * See Diagram 6 RS-422

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

## Allen-Bradley PLCs

### Panel Powered via PLC's Port or EA-MG-P1, Port 1 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
Allen-Bradley MicroLogix	1000, 1100, 1200, 1500	8-pin mini-din port RJ45 8-pin phone plug	Not Possible	Not Possible	Not Possible	Not Possible
Allen-Bradley SLC500	5/03, 5/04, 5/05 5/01, 5/02, 5/03	9-pin D-sub port RJ45 8-pin phone plug				
Allen-Bradley ControlLogix	all	9-pin D-sub port				
Allen-Bradley CompactLogix	all	9-pin D-sub port				
Allen-Bradley FlexLogix	all	9-pin D-sub port				
Allen-Bradley PLC5	all	25-pin D-sub port RJ45 8-pin phone plug				

## Allen-Bradley PLCs

## Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart						
PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			Serial Port with DC Power Adapter			
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.			
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
Allen-Bradley MicroLogix	1000, 1100, 1200, 1500	8-pin mini-din port	Not Possible		DF1 Full Duplex, DF1 Half Duplex	EA-MLOGIX-CBL RS-232
		RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232
Allen-Bradley SLC500	5/03, 5/04, 5/05	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
	5/01, 5/02, 5/03	RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232
Allen-Bradley ControlLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley CompactLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley FlexLogix	all	9-pin D-sub port			DF1 Full Duplex, DF1 Half Duplex	EA-SLC-232-CBL RS-232
Allen-Bradley PLC5	all	25-pin D-sub port			DF1 Full Duplex	EA-PLC5-232-CBL RS-232
		RJ45 8-pin phone plug			DH485/AIC/AIC+	EA-DH485-CBL RS-232

## GE, Mitsubishi, Omron, Modicon and Siemens PLCs Panel Powered via PLC's Port or EA-MG-P1, Port 1 Communications

PLC Compatibility &amp; Connection Chart

PLC			C-more Micro-Graphic Panel			
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.			
			PLC Port Powered		DC Power Adapter	
			Powered with 5 VDC from the connected PLC's comm. port.		Powered from an external 24 VDC source using the DC Power Adapter, EA-MG-P1.	
			Using panel's RJ12 port 1		Using panel's RJ12 port 1	
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type
GE	90/30, 90/70	15-pin D-sub port	Not Possible	Not Possible	Not Possible	Not Possible
	Micro 90, VersaMax Micro	RJ45 Port 1				
		15-pin D-sub port Port 2				
Mitsubishi	Melsec FX Series	25-pin D-sub port				
		8-pin mini-din port				
Omron	C200 (Adapter), C500	25-pin D-sub port				
	CJ1, CS1, CQM1, CPM1	25-pin D-sub port				
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU	varies				
Siemens	S7-200 CPU	9-pin D-sub port 0 or 1				

## GE, Mitsubishi, Omron, Modicon and Siemens PLCs Panel Powered via EA-MG-SP1, Port 1 or Port 2 Communications

PLC Compatibility & Connection Chart							
PLC			C-more Micro-Graphic Panel				
Family	CPU	Port & Type	Panel to PLC Cabling Components Required for Specific Port and Protocol being used.				
			Serial Port with DC Power Adapter				
			Powered from an external 24 VDC source using the Serial Port with DC Power Adapter, EA-MG-SP1.				
			Using panel's RJ12 port 1		Using adapter's serial Port 2 DB 15-pin - female		
			Protocol(s) Supported	Components & Network Type	Protocol(s) Supported	Components & Network Type	
GE	90/30, 90/70	15-pin D-sub port	Not Possible		SNPX	EA-90-30-CBL RS-422	
	Micro 90, VersaMax Micro	RJ45 Port 1			SNPX	* See Diagram 12 RS-232	
		15-pin D-sub port Port 2			SNPX	EA-90-30-CBL RS-422	
Mitsubishi	Melsec FX Series	25-pin D-sub port			CPU Direct	EA-MITSU-CBL RS-422	
		8-pin mini-din port				EA-MITSU-CBL-1 RS-422	
Omron	C200 (Adapter), C500	25-pin D-sub port			Host Link	EA-OMRON-CBL RS-232	
	CJ1, CS1, CQM1, CPM1	25-pin D-sub port			FINS	* See Diagram 7 & 8 RS-232	
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU	varies			Modbus RTU	* See Diagram 9, 10 & 11 RS-232	
Siemens	S7-200 CPU	9-pin D-sub port 0 or 1			PPI	* See Diagram 13 RS-485	

\* Note: Wiring Diagrams for user constructed cables start on page 6-31.

## Available Purchased Cables

Cable Description	Cable Part No.
<b>Cables for direct connect to panel's serial port 1 (Panel powered from PLC's serial port.)</b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	<b>DV-1000CBL</b>
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	<b>D4-1000CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) Use with DV-1000CBL cable.	<b>FA-15HD</b>
<b>Direct</b> LOGIC PLC 15-pin D-sub port, DL405 (RS-232C). Use with DV-1000CBL cable.	<b>FA-CABKIT</b>
<b>Cables for direct connect to panel's serial port 1 (Panel powered from either optional DC Power Adapter, EA-MG-P1, or Serial Port w/ DC Power Adapter, EA-MG-SP1.)</b>	
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>OP-3CBL-1</b>

Cable Description	Cable Part No.
<b>Cables used with optional serial port 2 (Panel powered from optional Serial Port w/ DC Power Adapter, EA-MG-SP1.)</b>	
<b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C).	<b>EA-2CBL</b>
<b>Direct</b> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).	<b>EA-2CBL-1</b>
<b>Direct</b> LOGIC PLC RJ-11 port, D3-340 (RS-232C).	<b>EA-3CBL</b>
<b>Direct</b> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).	<b>EA-4CBL-1</b>
<b>Direct</b> LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C).	<b>EA-4CBL-2</b>
Allen-Bradley MicroLogix 1000, 1100, 1200 & 1500 (RS-232C)	<b>EA-MLOGIX-CBL</b>
Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C)	<b>EA-SLC-232-CBL</b>
Allen-Bradley PLC-5 DF1 port (RS-232C)	<b>EA-PLC5-232-CBL</b>
Allen-Bradley MicroLogix, SLC 5-01/02/03, PLC5 DH485 port (RS-232C)	<b>EA-DH485-CBL</b>
GE 90/30 and 90/70, Micro 90, VersaMax Micro (Port 2) 15-pin D-sub port (RS-422A)	<b>EA-90-30-CBL</b>
MITSUBISHI FX Series 25-pin port (RS-422A)	<b>EA-MITSU-CBL</b>
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	<b>EA-MITSU-CBL-1</b>
OMRON Host Link (C200 Adapter, C500) (RS-232C)	<b>EA-OMRON-CBL</b>



Part No. EA-2CBL



Part No. EA-2CBL-1



Part No. EA-3CBL



Part No. EA-4CBL-1



Part No. EA-4CBL-2

## Available Purchased Cables (cont'd)



Part No. DV-1000CBL



Part No. D4-1000CBL



Part No. FA-15HD



Part No. FA-CABKIT



Part No. OP-3CBL-1



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



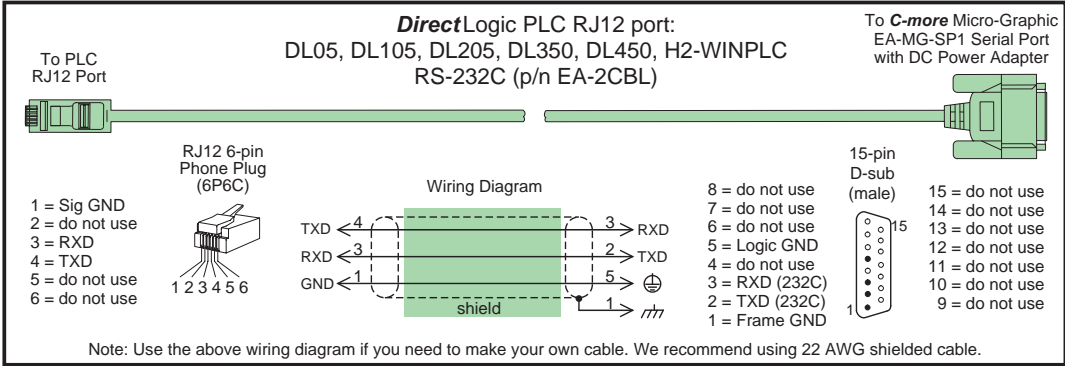
Part No. EA-OMRON-CBL

# Available Purchased Cables – Wiring Diagrams

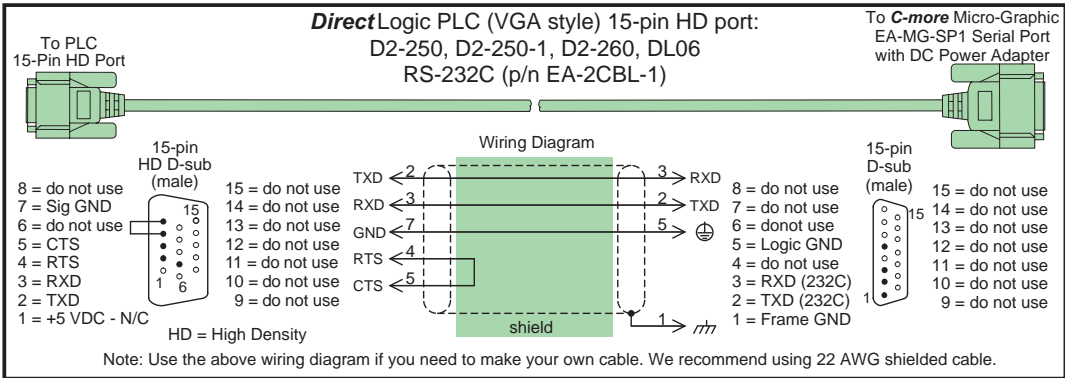
The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the *C-more* Micro-Graphic panels and various PLCs. Part numbers are included with the pre-made cables that can be purchased from *AutomationDirect*. The information presented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

## DirectLOGIC:

## EA-2CBL



## EA-2CBL-1

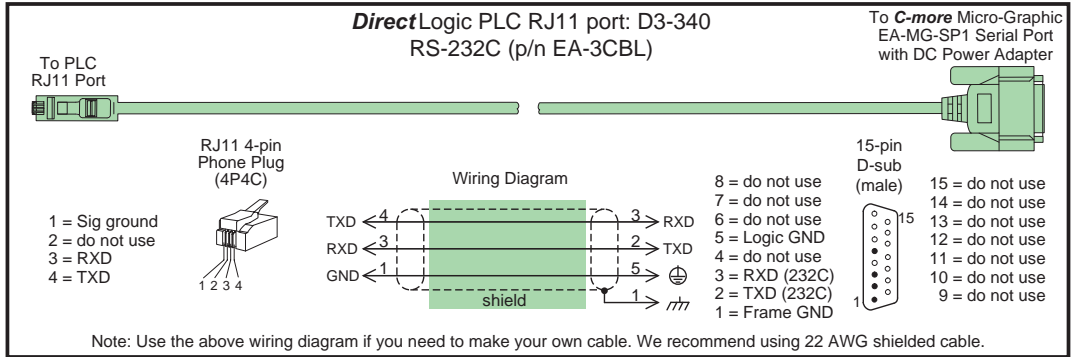




## Available Purchased Cables – Wiring Diagrams (cont'd)

**DirectLOGIC:**

**EA-3CBL**

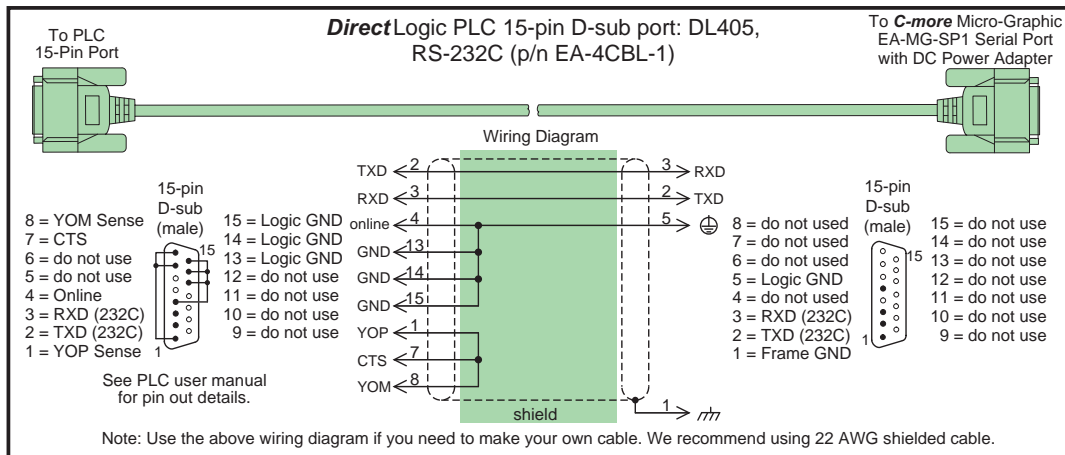


6

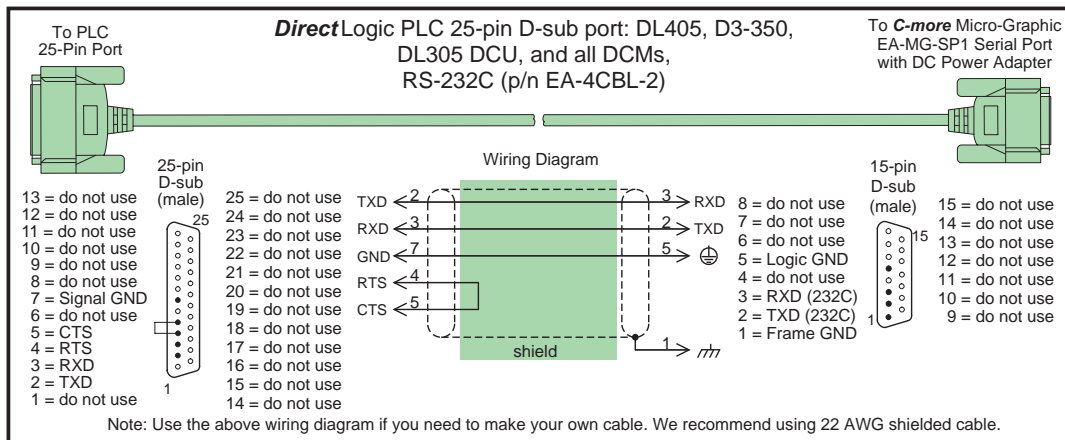
## Available Purchased Cables – Wiring Diagrams (cont'd)

### DirectLOGIC:

### EA-4CBL-1



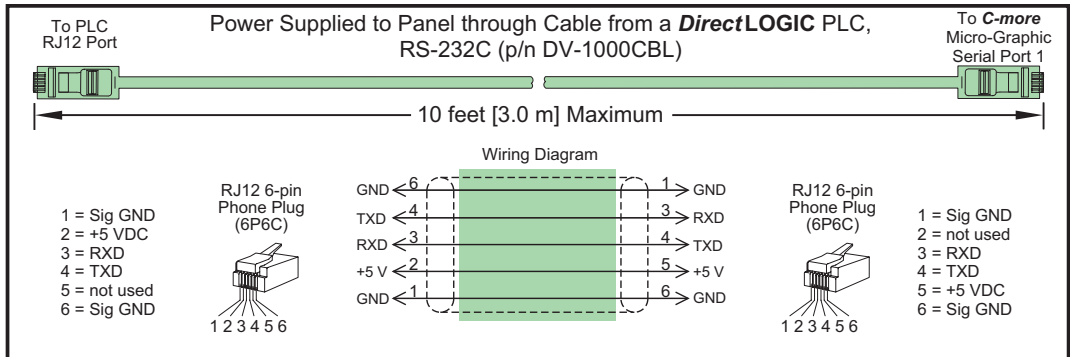
### EA-4CBL-2



## Available Purchased Cables – Wiring Diagrams (cont'd)

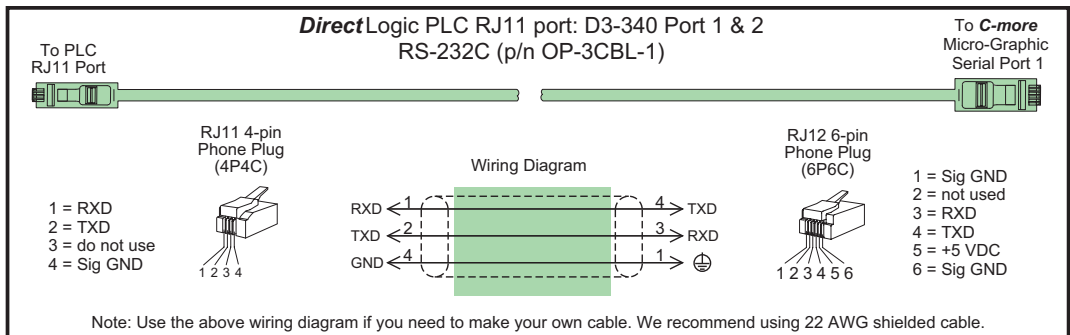
**DirectLOGIC:**

**DV-1000CBL**



6

**OP-3CBL-1**



## Available Purchased Cables – Wiring Diagrams (cont'd)

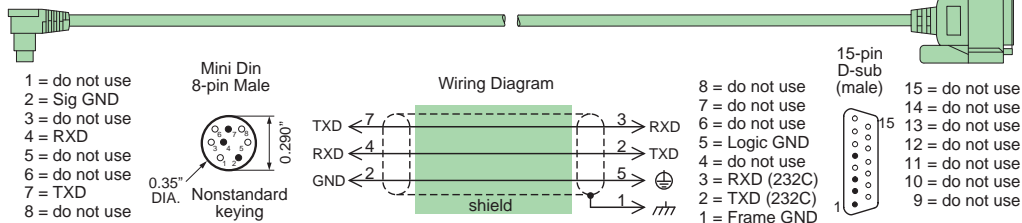
### Allen-Bradley:

### EA-MLOGIX-CBL

To AB MicroLogix RS-232C communication channel

Allen-Bradley MicroLogix™ 1000/1100/1200/1500  
RS-232C (p/n EA-MLOGIX-CBL)

To C-more Micro-Graphic  
EA-MG-SP1 Serial Port  
with DC Power Adapter



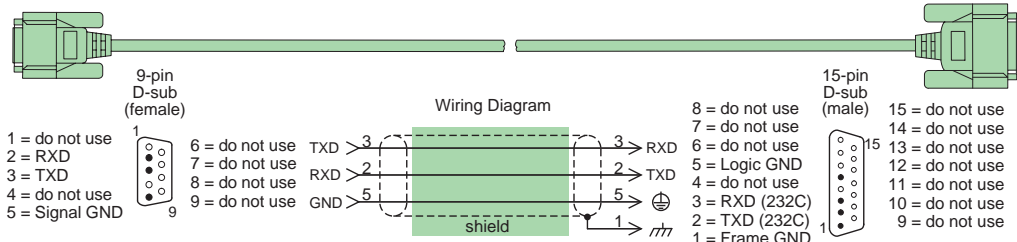
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

### EA-SLC-232-CBL

To PLC  
9-Pin Port

Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix,  
FlexLogix, DF1, RS-232C (p/n EA-SLC-232-CBL)

To C-more Micro-Graphic  
EA-MG-SP1 Serial Port  
with DC Power Adapter



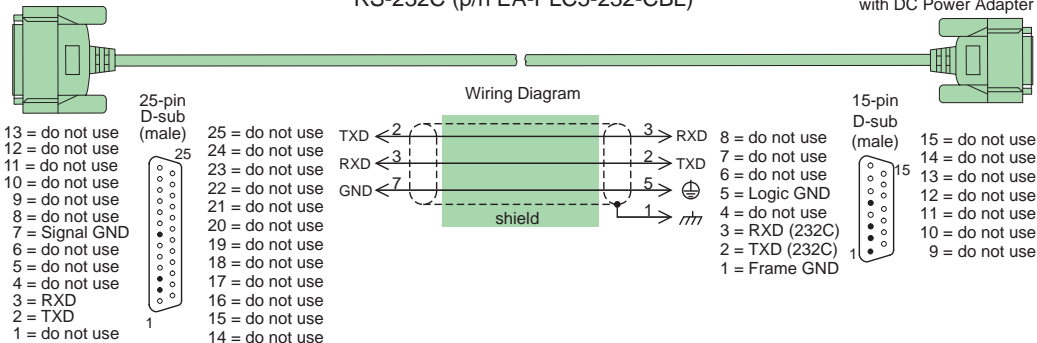
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

### EA-PLC5-232-CBL

To PLC  
25-Pin Port

Allen-Bradley PLC5, DF1,  
RS-232C (p/n EA-PLC5-232-CBL)

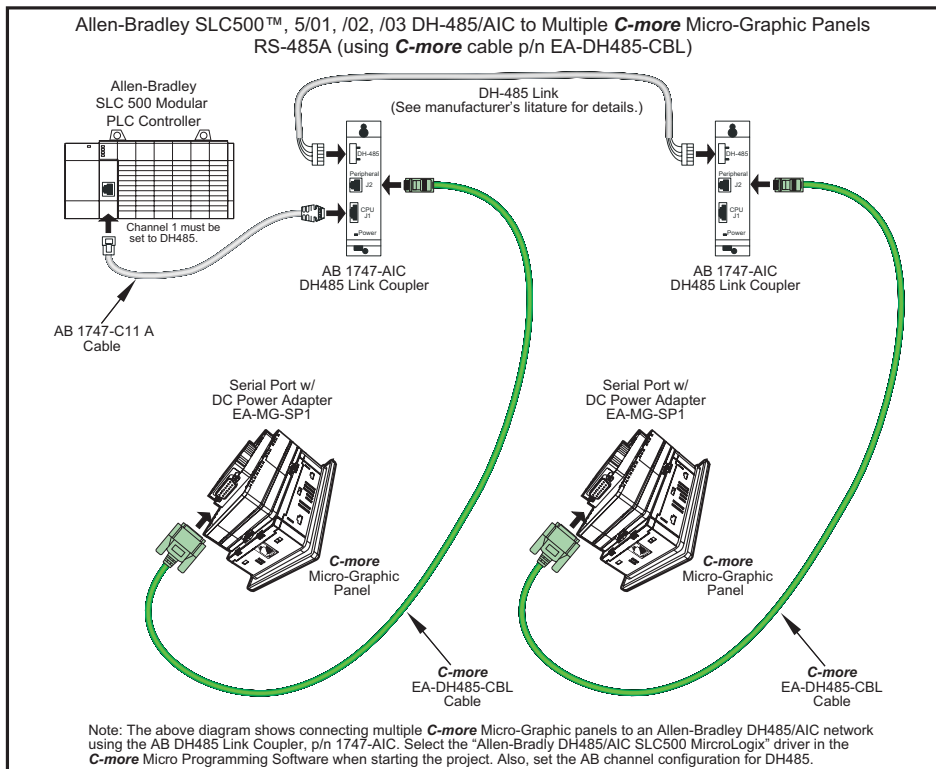
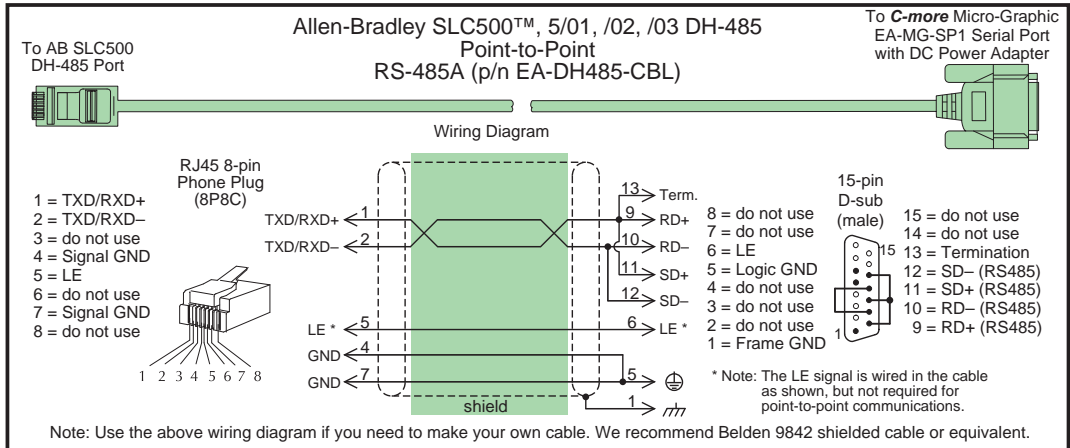
To C-more Micro-Graphic  
EA-MG-SP1 Serial Port  
with DC Power Adapter



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

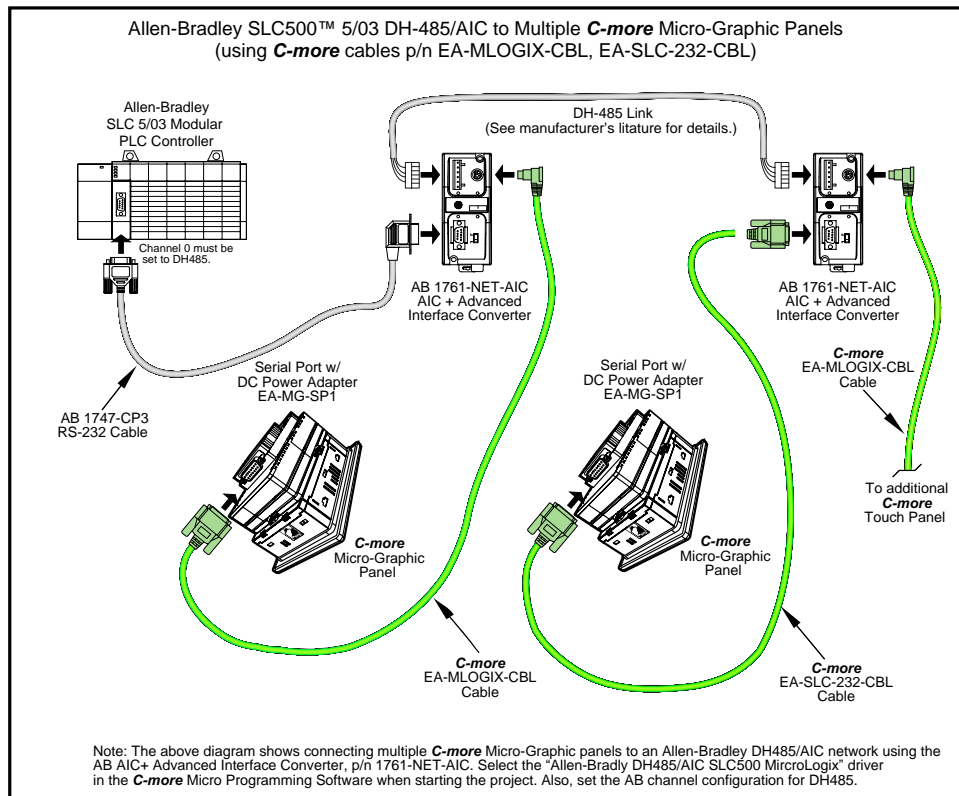
# Available Purchased Cables – Wiring Diagrams (cont'd)

Allen-Bradley:

**EA-DH485-CBL**

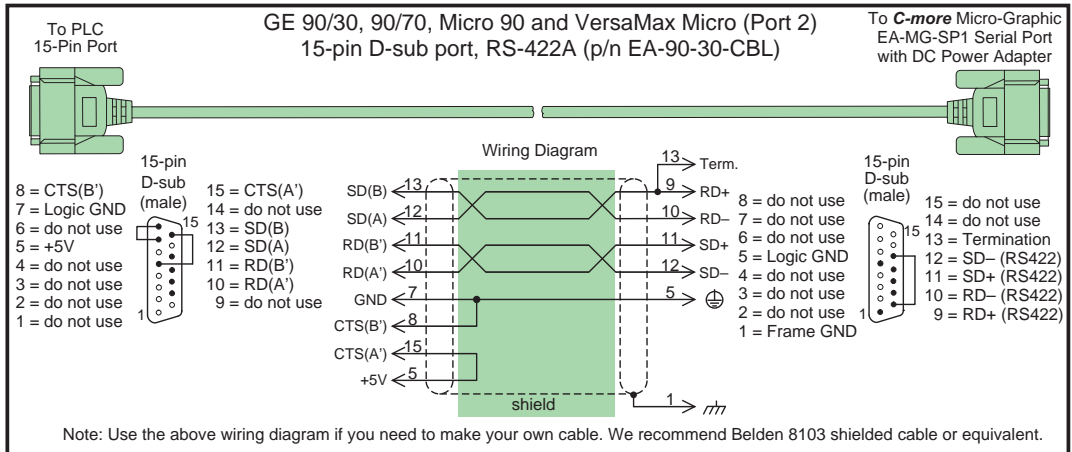
## Available Purchased Cables – Wiring Diagrams (cont'd)

### Allen-Bradley:



## Available Purchased Cables – Wiring Diagrams (cont'd)

GE:

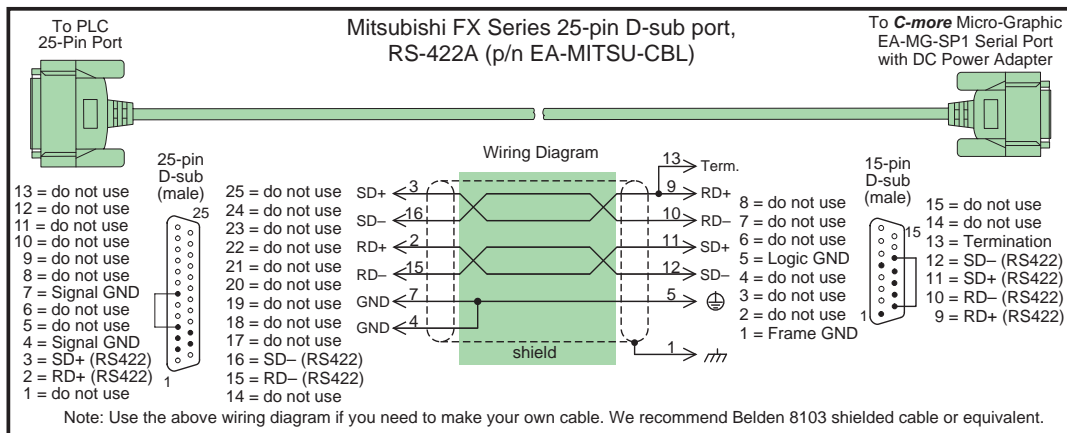
**EA-90-30-CBL**

6

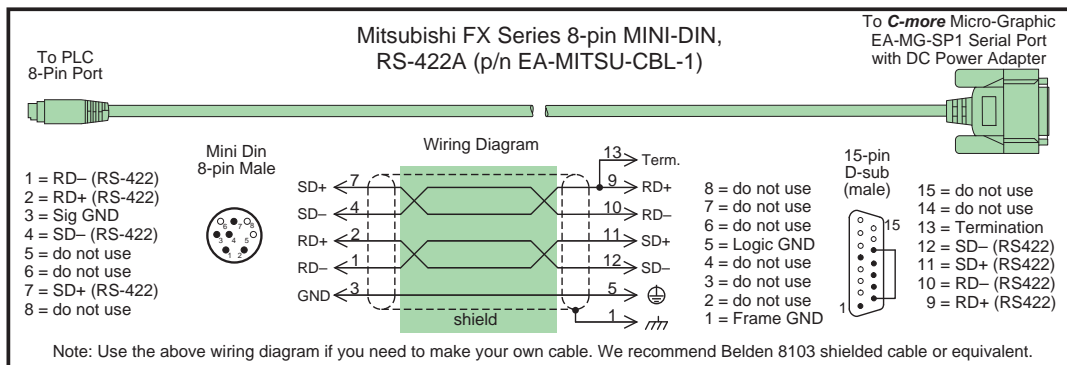
## Available Purchased Cables – Wiring Diagrams (cont'd)

### Mitsubishi:

### EA-MITSU-CBL



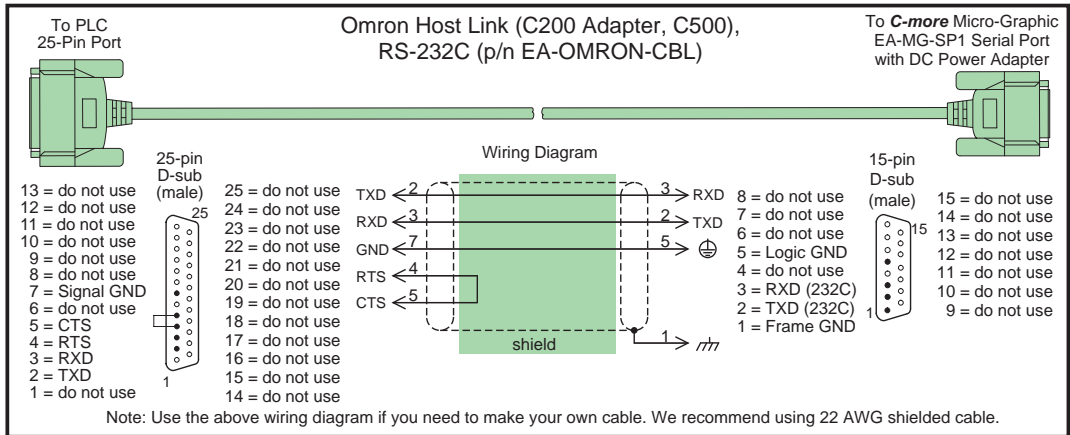
### EA-MITSU-CBL-1





## Available Purchased Cables – Wiring Diagrams (cont'd)

Omron:

**EA-OMRON-CBL**

6

# User Constructed Cables – Wiring Diagrams

Diagram 1

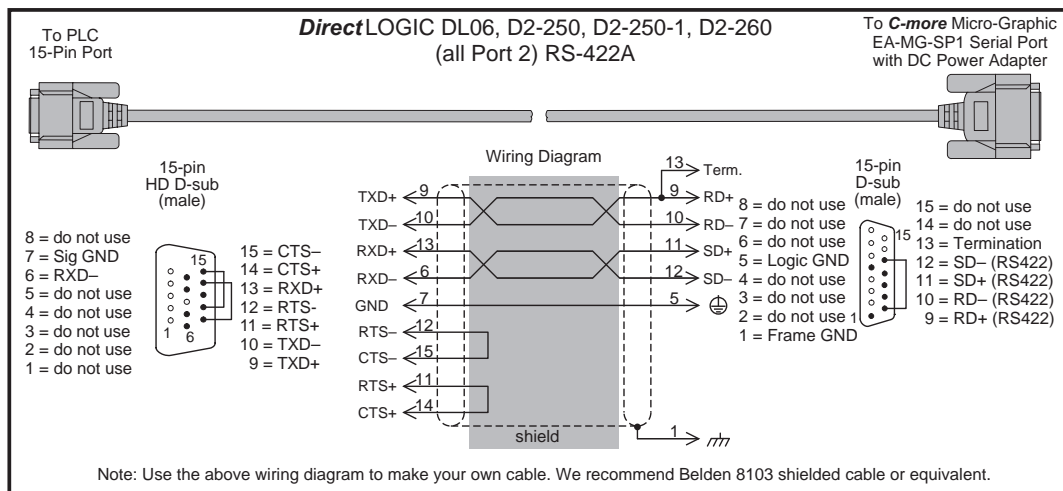
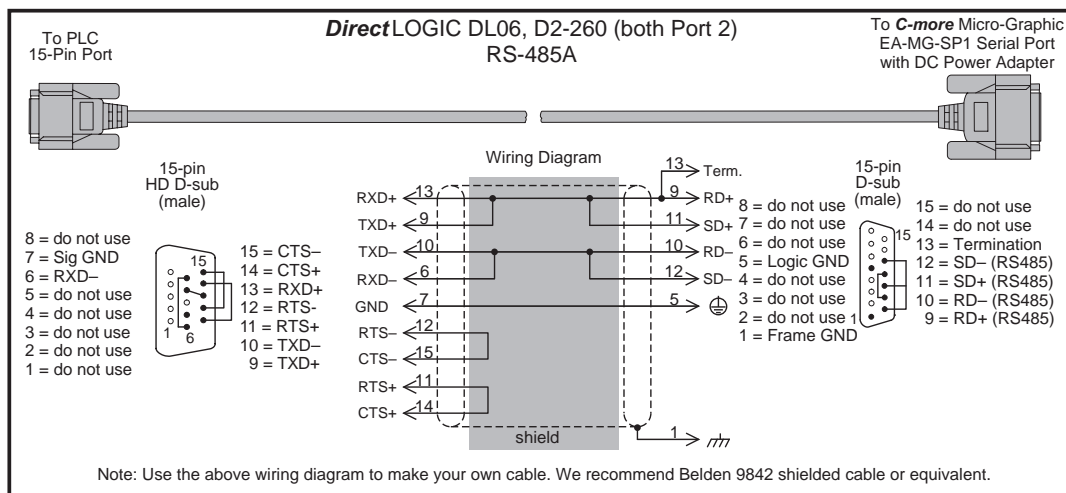
**User Constructed**

Diagram 2

**User Constructed**

**NOTE:** The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-38 if more than one PLC will be connected to a panel.

# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 3

User Constructed

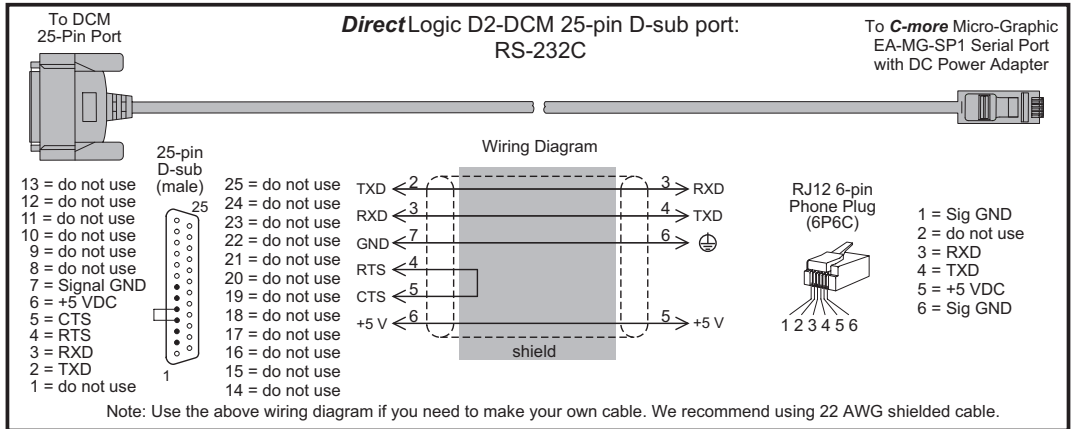
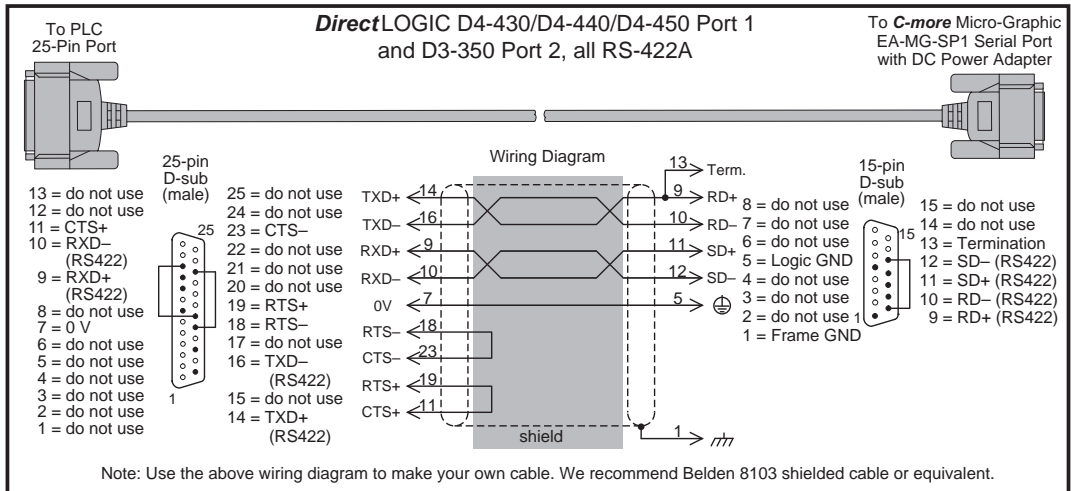


Diagram 4

User Constructed



**NOTE:** The RS-422 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-38 if more than one PLC will be connected to a panel.

# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 5

User Constructed

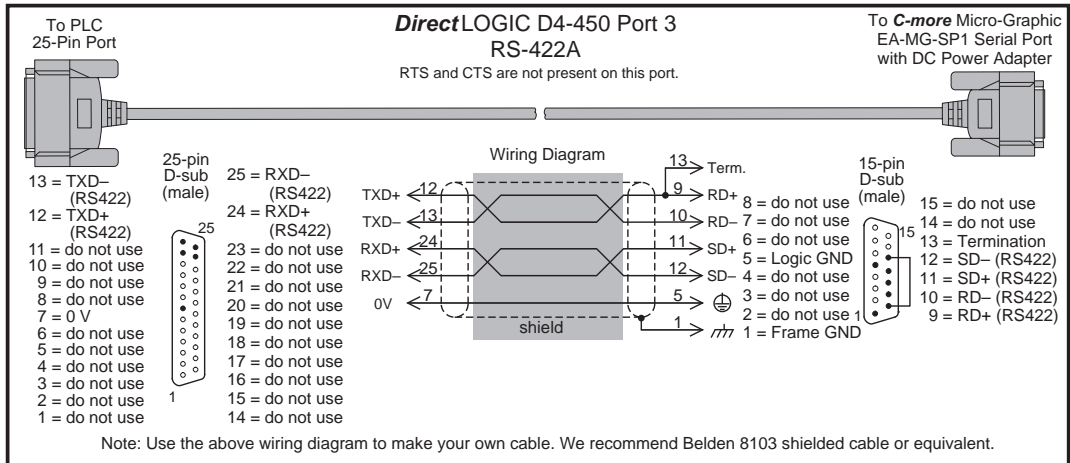
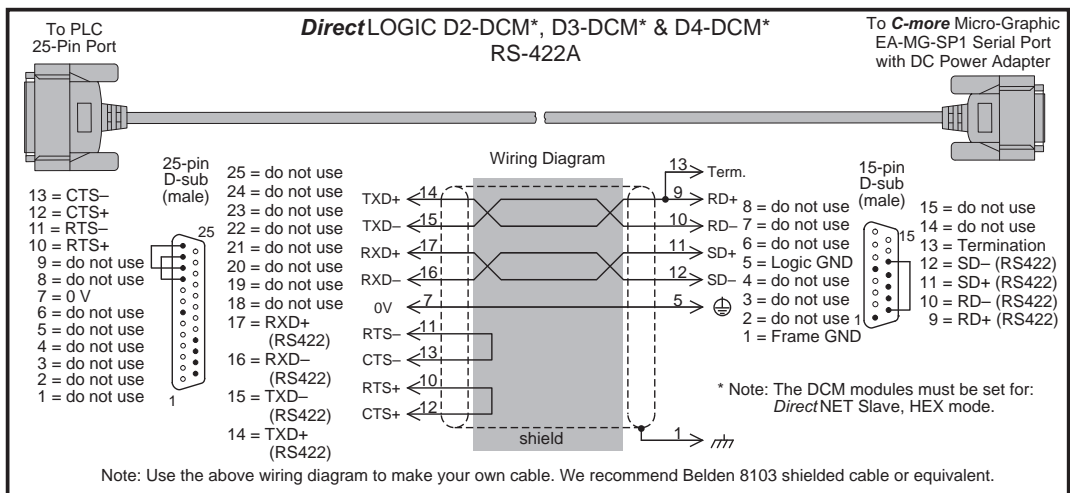


Diagram 6

User Constructed



**NOTE:** The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-38 if more than one PLC will be connected to a panel.

## User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 7

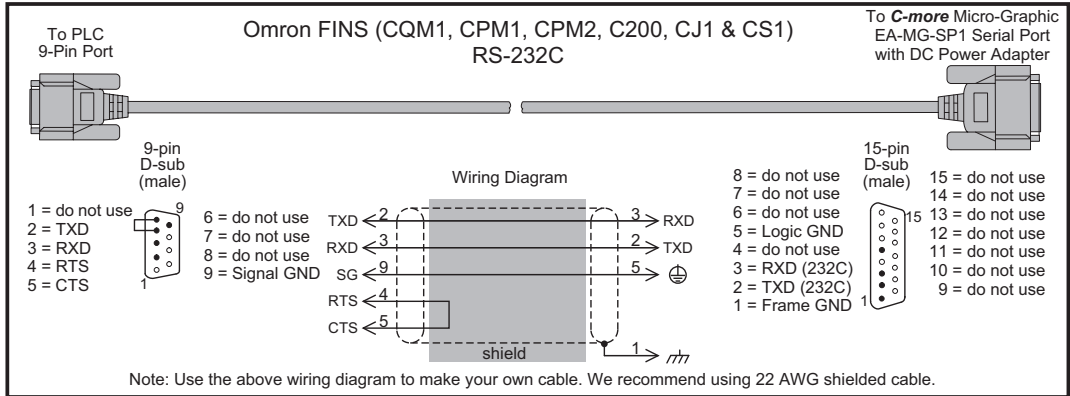
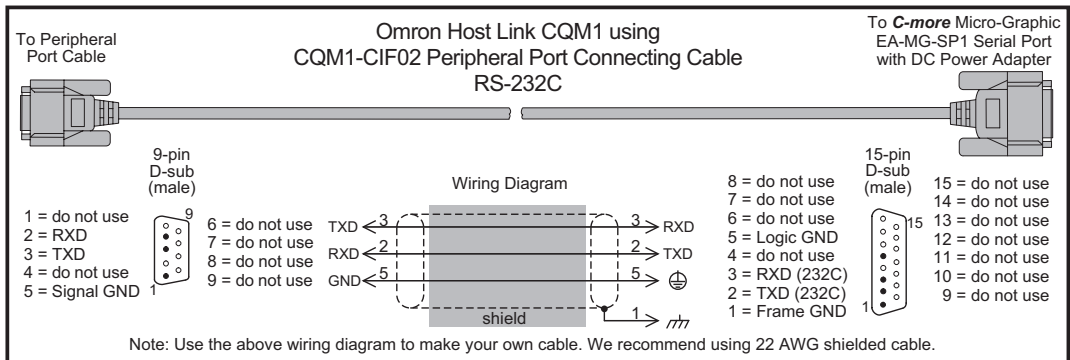
**User Constructed**

Diagram 8

**User Constructed**

## User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 9

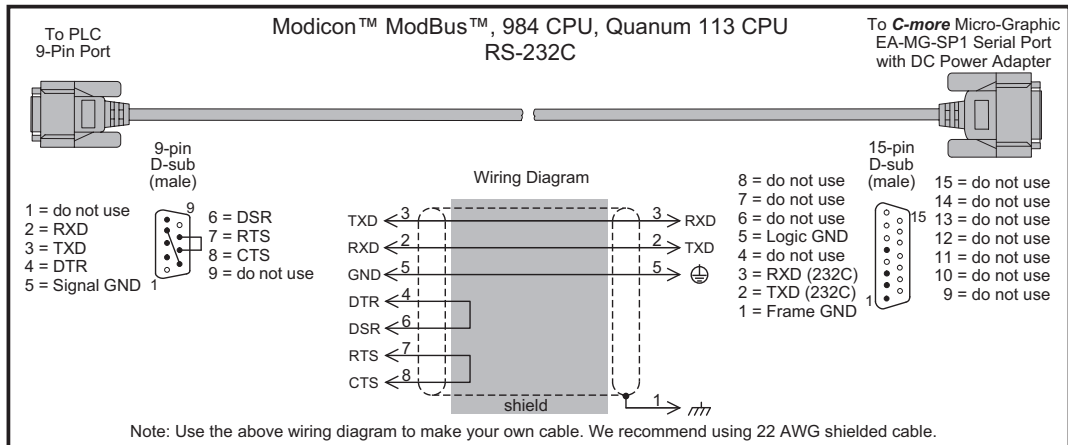
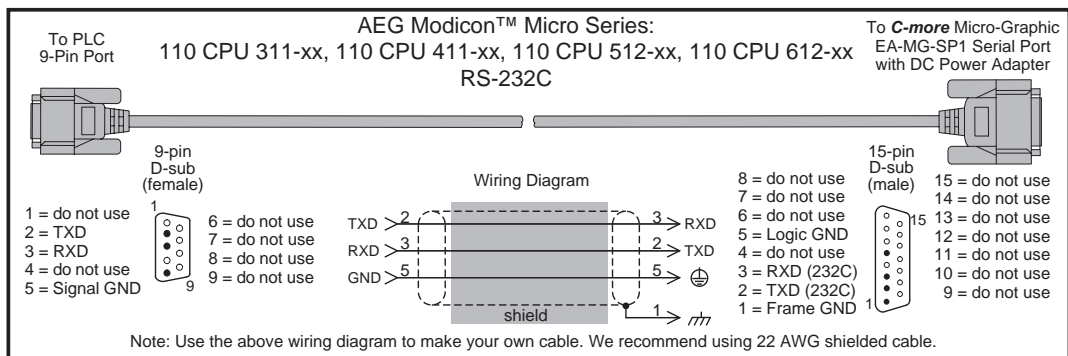
**User Constructed**

Diagram 10

**User Constructed**

# User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 11

User Constructed

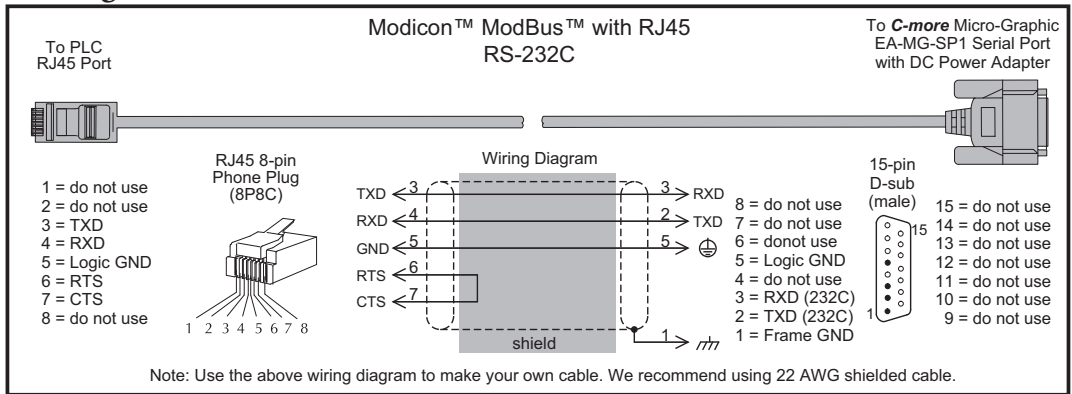


Diagram 12

User Constructed

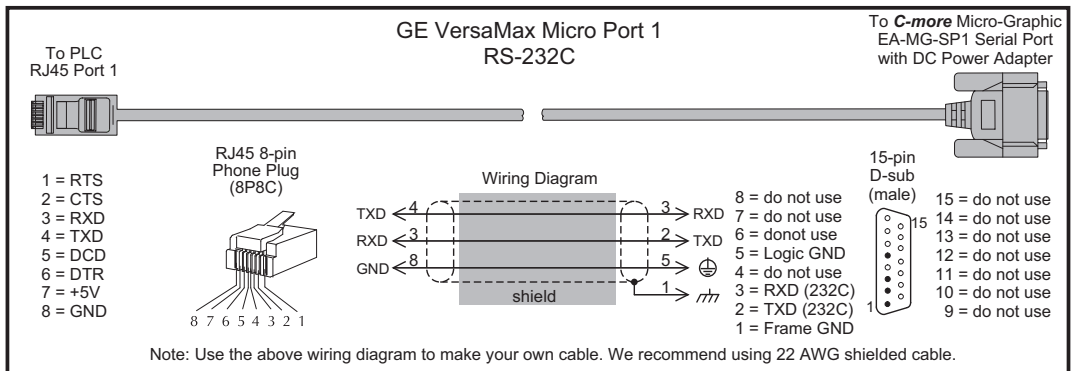
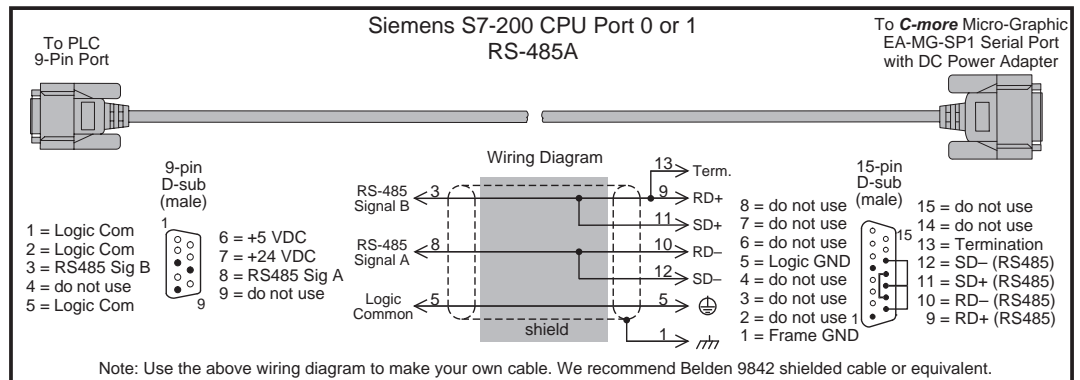


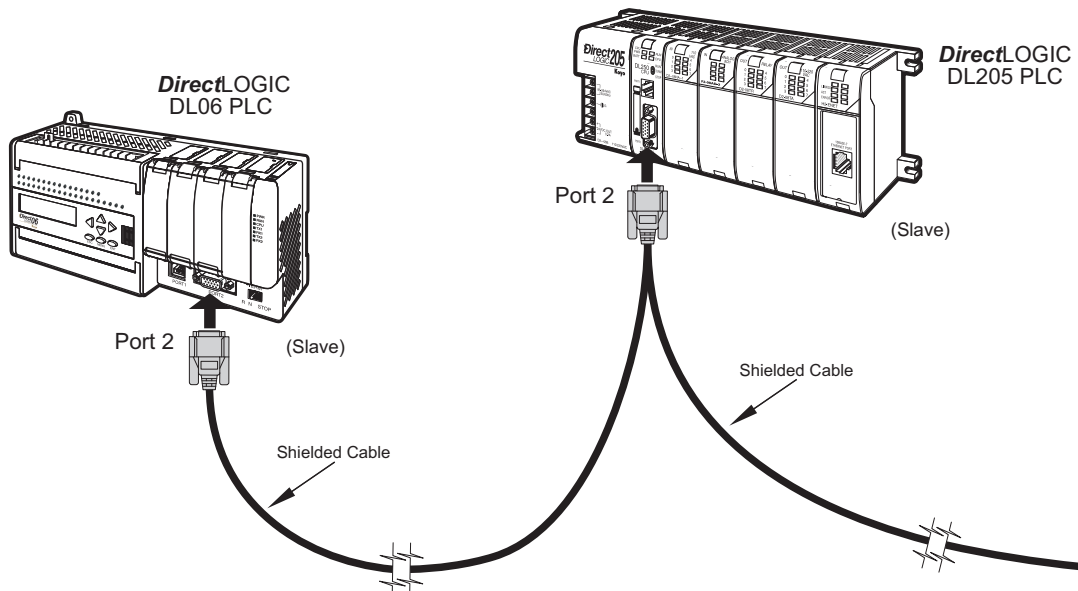
Diagram 13

User Constructed

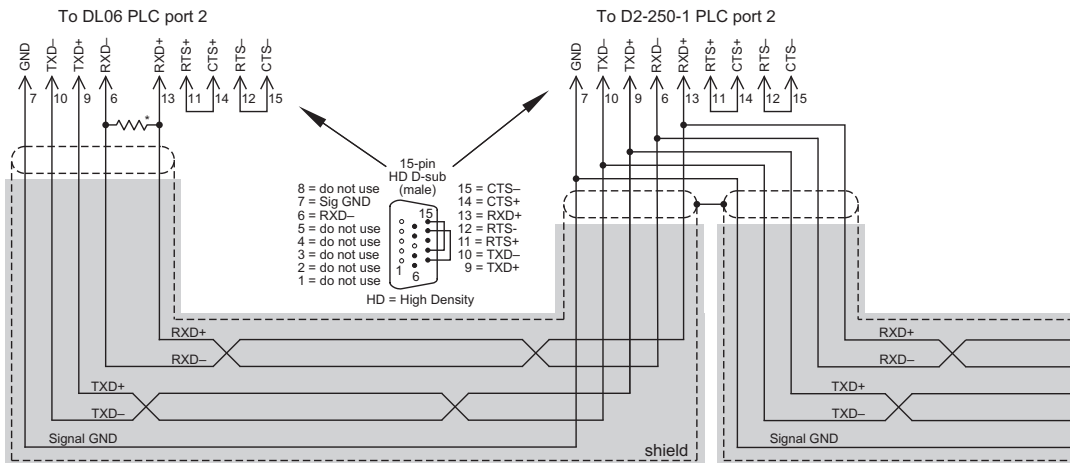


# RS-422A/RS-485A Multi-Drop Wiring Diagram Examples

6



Note: We recommend Belden 8103 shielded cable or equivalent.

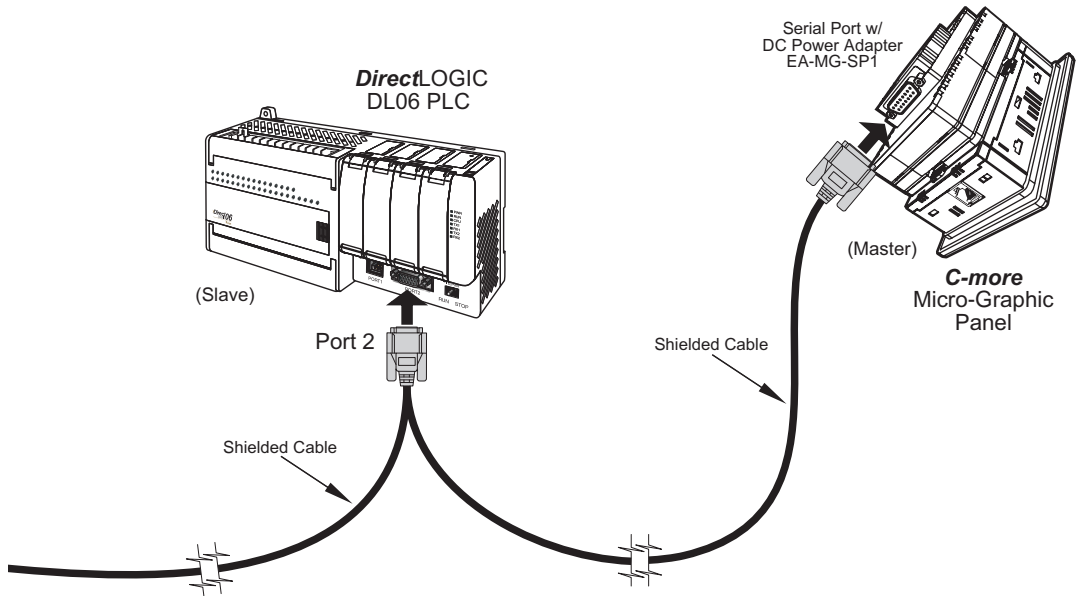


\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

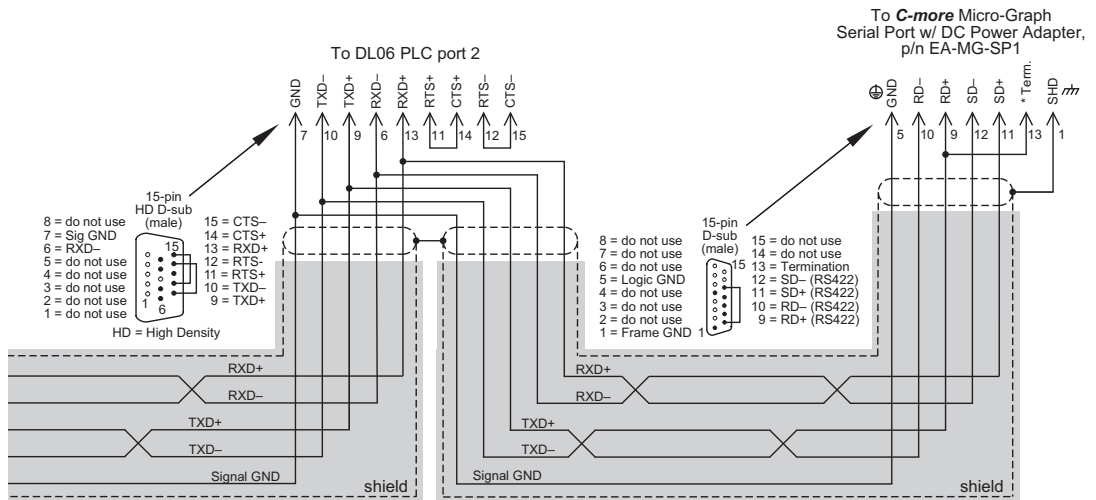
Typical RS-422 Multi-Drop Wiring Diagram



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



Note: We recommend Belden 8103 shielded cable or equivalent.

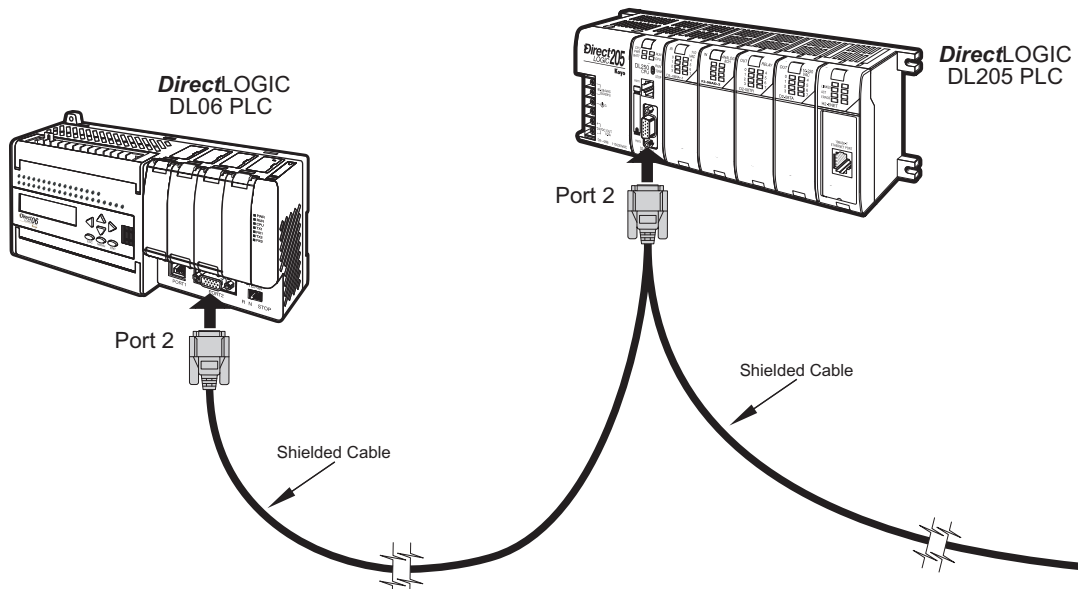


\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more EA-MG-SP1 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

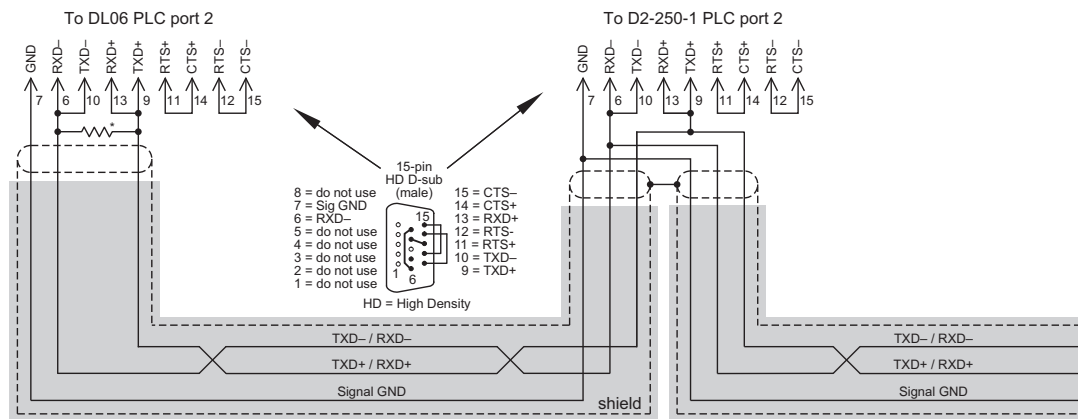
Typical RS-422 Multi-Drop Wiring Diagram (cont'd)

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

6



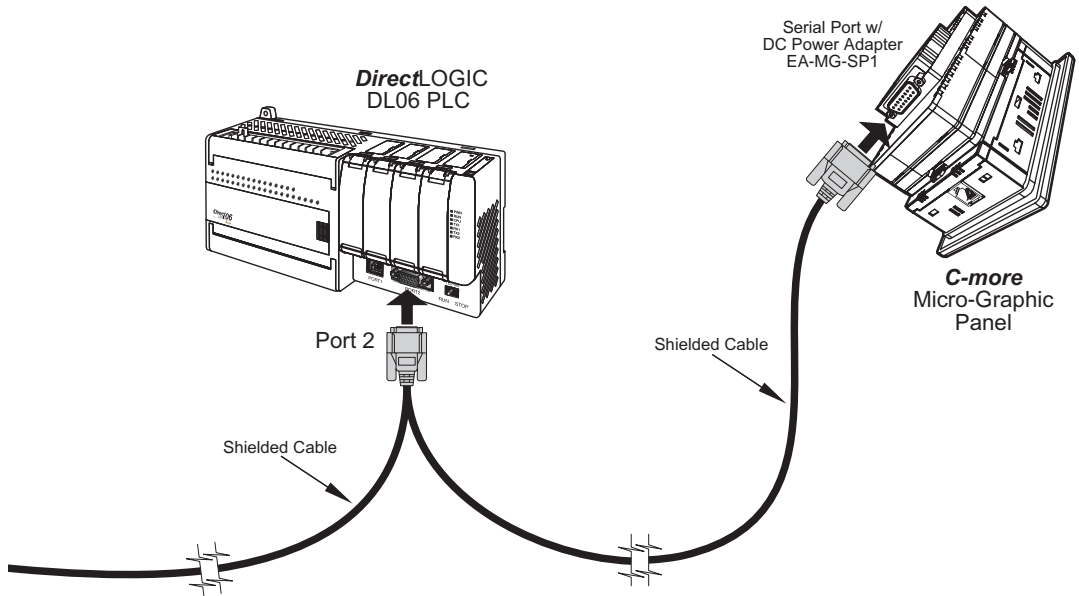
Note: We recommend Belden 88102 shielded cable or equivalent.



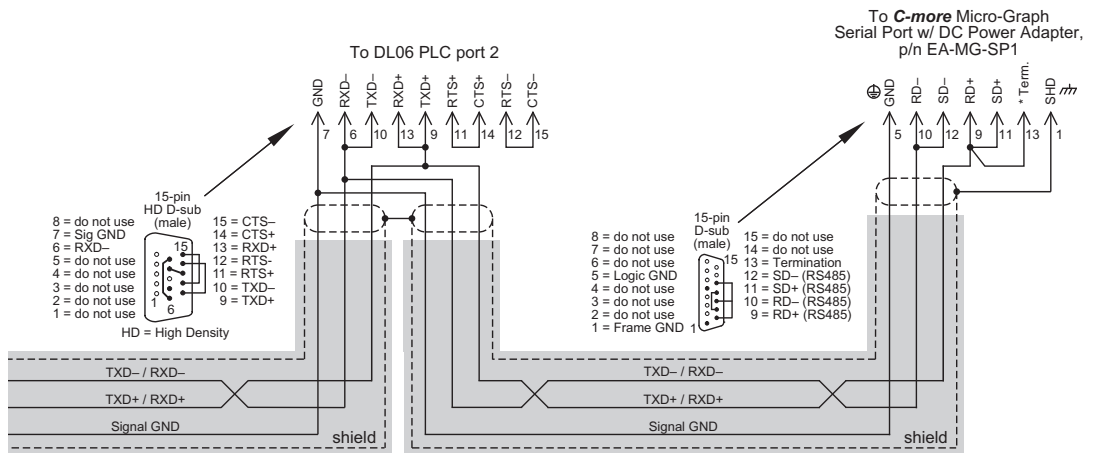
\* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-485 Multi-Drop Wiring Diagram

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



Note: We recommend Belden 88102 shielded cable or equivalent.



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

\* 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 EA-MG-SP1 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.

# MAINTENANCE

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# CHAPTER 7

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# Maintenance



Although the *C-more*® Micro-Graphic panels require very little maintenance, setting up a routine maintenance schedule will insure 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 bi-annually.

## Project Backup

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

## Check Operating Environment

Make sure the Micro-Graphic panel is operating in the proper temperature range: (0 to 50 °C (32 to 122 °F)).



Make sure the Micro-Graphic panel 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 Micro-Graphic panel to make sure it is within the appropriate range.

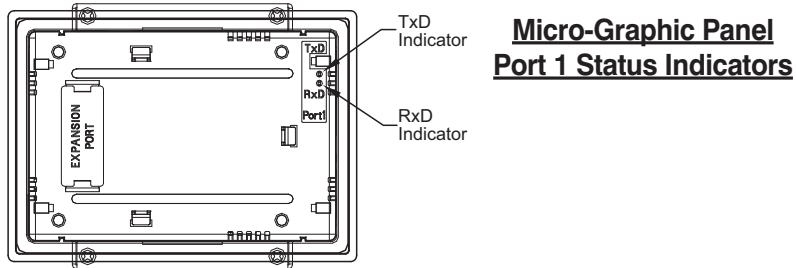


**5 VDC:** If the panel is being powered with 5 VDC from an *AutomationDirect* PLC's RJ12 serial communications port to Port 1 on the panel, the acceptable voltage range to the panel is 4.75-5.25 VDC (1.05 W @ 5 VDC (210 mA)).

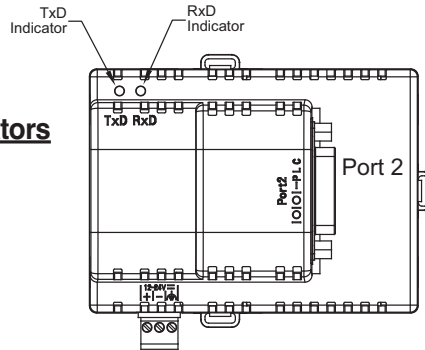
**24 VDC:** If the panel is being powered from the optional EA-MG-P1 DC Power Adapter, or the EA-MG-SP1 Serial Port with DC Power Adapter, the acceptable voltage range to the adapter is 10.8-26.4 VDC (100 mA @ 24 VDC).

## Check Transmit and Receive Indicators

During a routine maintenance check is a good time to take a quick look at the status indicators on the back of the Micro-Graphic panel, and the EA-MG-SP1 Serial Port w/ DC Power Adapter, if being used. There should be activity on both the Tx/D and Rx/D LED indicators when connected serially to a PLC or control device from either port.



## EA-MG-SP1 Port 2 Status Indicators



## Check Physical Conditions

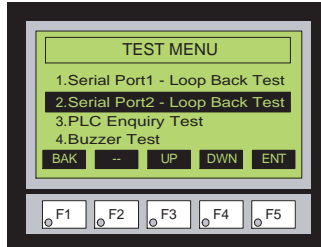
Make sure that harmful chemicals are not being used around the Micro-graphic panel. Look for any deterioration of the panel's bezel and front display area. See **Chapter 2: Specifications** for a chemical compatibility list.

Check the mounting gasket to make sure it is sealing properly and has not deteriorated. Replace the mounting gasket if there are any signs of deterioration, or if there is any evidence that moisture/liquids have penetrated to the inside of the enclosure where the panel is mounted. Information on replacement gaskets can be found in **Chapter 9: Replacement Parts**.

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

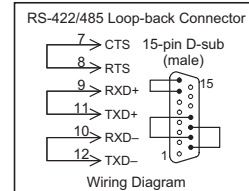
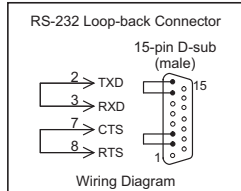
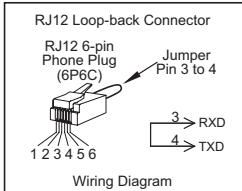
## Run Tests under the System Setup Screens

Use the Micro-Graphic panel's System Setup Screens to test communication ports, PLC connectivity, and the internal beeper. See **Chapter 5: System Setup Screens** for additional details. Below is shown the Test Menu. Please note the Serial Port2 selection will only be seen when the EA-MG-SP1 Serial Port with DC Power Adapter option is installed on the panel.



**Serial Port 1** - Performs a test to verify the RJ12 serial communications port (Port 1) on the panel is operating correctly. Requires a loop back connector inserted into the port to properly run the test. A wiring diagram for the loop back connector is shown below.

**Serial Port 2** - Performs a test to verify either the RS-232 or the RS485/422 serial communications functionality from the 15-pin connector (Port 2) on the EA-MG-SP1 Serial Port with DC Power Adapter is operating correctly. Requires a loop back connector inserted into the port to properly run the test. A wiring diagram for either a RS-232 or RS-485/422 loop back connector is shown below.



**PLC Enquiry Test** - Tests the communications with the selected PLC protocol between the panel and a connected PLC. Is used with both Port 1 and Port 2.

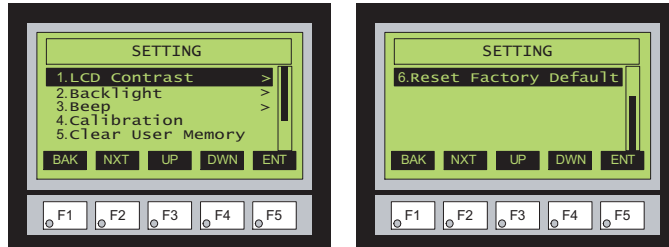
**Buzzer Test** - Use this option to test the internal audible beeper of the panel.



**NOTE:** The panel has one built-in RJ12 serial communications port (Port 1 - RS-232) and the option to add one 15-pin serial communications port (Port 2 - RS-232/422/485) to the panel by installing the EA-MG-SP1 module. **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port 1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

## Check Settings under the System Setup Screens

Use the Micro-Graphic panel's System Setup Screens to check the various settings such as the LCD contrast, background color, beep, etc. See **Chapter 5: System Setup Screens** for additional details. Below is shown the Setting Menu. Note the use of the up/down keys to access the last item.



**LCD Contrast** - Used to adjust the LCD display's contrast. The default is a value of 3, and the range is 1 to 5, with 5 being the highest contrast.

**Backlight** - There are five different available backlight colors. Use this option to select the default screen color and also cycle through the colors for checking.

## Cleaning the Display Screen

The display screen should be cleaned periodically by wiping it with a lint free damp cloth using a mild soap solution. Dry the surface when finished with a lint free cloth. Do not clean with ammonia based products. The ABS material the bezel is made from is reactive with ammonia.

The longevity of the display screen on the touch screen models can be increased by the use of a **EA-MG-COV-CL** clear screen overlay. See **Chapter 3: Accessories** for additional information on the screen overlay.

To prevent damage to the display screen on the touch screen models, avoid touching the screen with sharp objects, striking the screen with a hard object, using abrasives near the screen, or using excessive force when pressing the touch screen version.



## Check Project Functionality

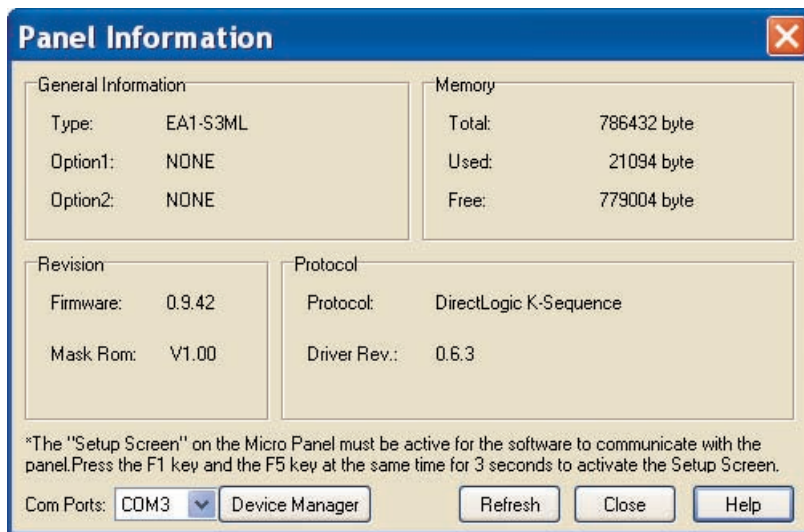
During a routine maintenance check is a good time to verify the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application. 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 Micro-Graphic panel application, now is a good time to also check these aids.

## Checks from the *C-more* Micro-Graphic Programming Software

If you have a PC available with the *C-more* Micro-Graphic Programming Software, EA-MG-PGMSW, installed, and the PC is connected to the panel, you can check the status of the panel by using the **Panel Information** window.

The **Panel Information** window shown below will indicate the panel type, any options such as a keypad bezel or DC power adapter that have been installed, the total memory, memory used, free memory, firmware version, mask ROM version, and the PLC protocol the panel has been setup for using on its serial communication port. The programming software can also be used to update the panel's firmware to the latest version.



**Notes:****7**

# **TROUBLESHOOTING**

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# **CHAPTER 8**

## **In This Chapter...**

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# Troubleshooting



The following are some common problems that may be encountered during the installation and operation of your *C-more*® Micro-Graphic panel. We have made some suggestions on what to check in order to correct the problem.

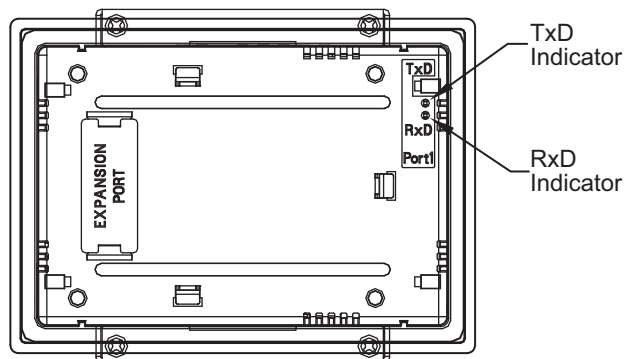
### Micro-Graphic Panel does not Power up

**Powered from 5 VDC:** If the panel's display is blank, not responding, and the panel is powered from a 5 VDC power source, check the incoming DC voltage level with a voltmeter. The DC voltage level should be in the range of 4.75 to 5.25 VDC. 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.

**Powered from 12-24 VDC:** If the panel's display is blank, not responding, and the panel is powered from one of the optional DC Power Adapter modules, such as an EA-MG-P1 or EA-MG-SP1, check the incoming DC voltage level to the adapter with a voltmeter. The DC voltage level to the adapter should be in the range of 10.8-26.4 VDC. 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.

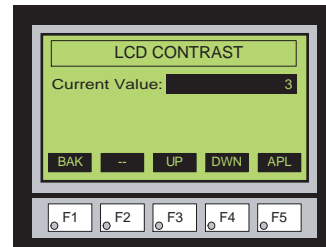
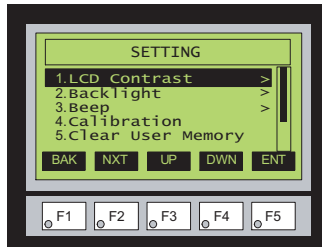
### Display is Blank

Also if the panel's display is blank, check the TxD and RxD indicators on the back side of the panel while the panel is communicating with the PLC. The LED indicators should be on or flashing at a fast rate. Indicator activity shows that the panel is communicating with the PLC. If there is communication activity, but the display is still blank, there is the possibility the program in the PLC is controlling the display. Try pressing the F1 and F5 keys simultaneously for 3 seconds. The panel should display the System Setup Screen menu if the screen is being forced to display a blank by the PLC program, or check the PLC program, it may have the screen in the off state by placing a 0 in the current screen tag.



## Display is Dim

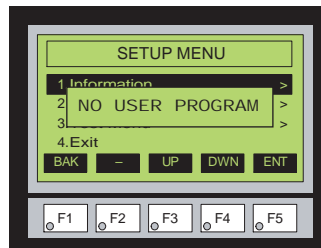
Press the F1 and F5 keys simultaneously for 3 seconds to access the System Setup Screen menu. Select the Setting menu, and then select item 1, LCD Contrast. The default value is 3. Adjust the current value from 1 to 5 and the panel's contrast should become greater as the value moves toward 5 and it should become less as the value moves toward 1. If this does not happen, then the panel may need to be replaced.



## No User Program

If the panel is displaying the message "No User Program" after it is powered up, then there is no project downloaded into the panel. Using the EA-MG-PGMSW C-more Micro-Graphic Programming Software, download your project to the panel.

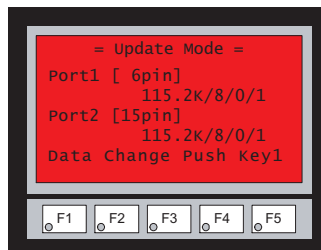
8



### Lost Firmware – Red ‘Update Mode’ Screen Displayed

If the Micro-Graphic panel's firmware becomes corrupted or for some reason is lost from the panel's memory, the panel will display the **Update Mode** screen as shown below. This can happen if communication between the PC and the panel is interrupted during a firmware update from the programming software. To resolve the problem, try the following steps in the order shown:

- 1.) Cycle power to the panel.
- 2.) Attempt to reload the firmware to the panel using the **Update Firmware** utility under the **Panel** pull down menu in the EA-MG-PGMSW Programming Software.
- 3.) If the firmware update is not successful, depress function keys F1 and F5 while cycling power to the panel. The panel should come up in the red **Update Mode** screen as shown below. Perform Step 2 again.
- 4.) Call Tech Support @ 770-844-4200.



## No Communications between Panel and PC (Personal Computer)

The *C-more* Micro-Graphic panel is programmed using the *C-more* Micro-Graphic Programming Software, EA-MG-PGMSW. The developed project is transferred from the PC to the panel by a USB to RS-232 serial communications cable. The EA-MG-PGM-CBL Serial Programming Cable Assembly can be used to accomplish the interface between the PC and panel. Installing the programming software also installs a USB driver on the PC. When properly installed the programming cable will look like a serial communications port to the PC.

### USB to RS-232 Programming Cable Assembly



**NOTE:** The panel has one built-in RJ12 serial communications port (Port 1 - RS-232) and the option to add one 15-pin serial communications port (Port 2 - RS-232/422/485) to the panel by installing the EA-MG-SP1 module. **Only one** of the ports can be used with a connected PLC. The programming software allows the user to select either Comm. Port1 or Comm. Port2 under the Panel Manager dialog box. When using Port 2 to communicate with the connected PLC, Port 1 can still be used with the EA-MG-PGM-CBL Software Programming Cable Assembly to transfer projects between the PC and panel.

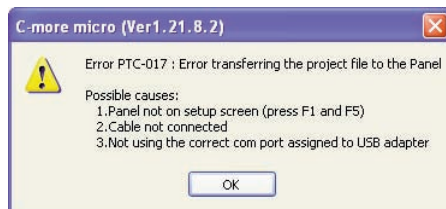


**NOTE:** If either DC power adapter is installed on the panel, the adapter must be powered and the panel not dependent on +5 VDC from the PLC's RJ12 comm port.

No communications between panel and PC continued top of next page.

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

There are three possible causes that prevent transferring the project to the *C-more* Micro-Graphic panel.

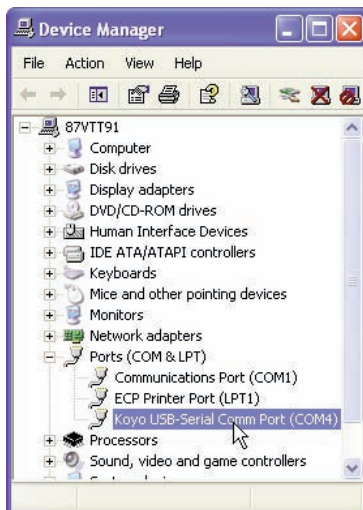
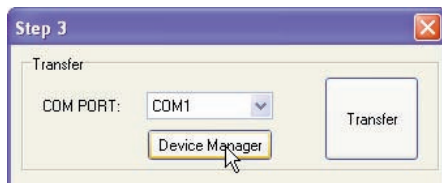


1. **Panel not on setup screen (press F1 and F5)** - Press and hold the F1 and F5 buttons simultaneously for three seconds to enter the setup screen.
2. **Cable not connected** - Double check the programming cable assembly to make sure the panel is correctly connected to the USB port on the PC.
3. **Not using the correct com port assigned to the USB adapter** - If the *C-more* Micro-Graphic panel



is on the setup screen and the cable connection is correct, then check the PC COM port setting. If you are unsure which COM port the *C-more* Micro-Graphic programming cable is connected to, click on the **Device Manager** button. This will open Windows ® **Device Manager**.

In the **Device Manager** window, view the active available ports by clicking the + button beside the Ports (COM & LPT) menu item. The *C-more* Micro-Graphic panel uses a USB driver called Koyo USB-Serial Comm Port. COM4 is the comm port used in this example. If you cannot



find the Koyo USB-Serial Comm Port under the Ports (COM & LPT) menu item in **Device Manager**, the USB driver may not be correctly installed or the driver has a problem. See the software installation manual for details on installing the Koyo USB-Serial Comm Port driver. If you have selected the correct COM port and the error still occurs, try connecting the programming cable to a different USB port on the PC and try again.

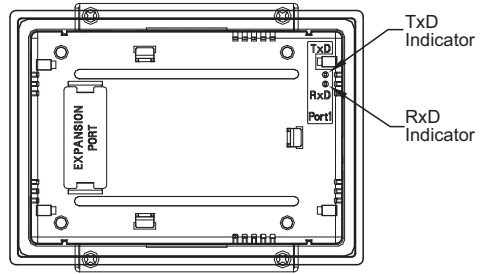
If the program persists, call Technical Support at (770) 844-4200, available from 9:00 A.M. to 6:00 P.M. Eastern Time.



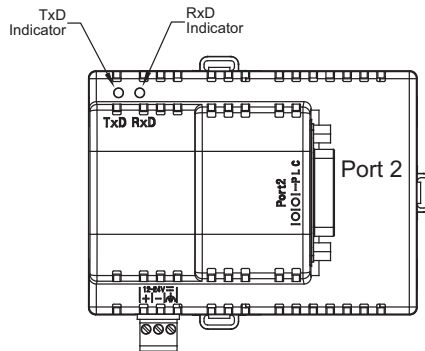
## No Communications between Panel and PLC

The communications between the *C-more* Micro-Graphic panel and a designated PLC or controlling device can be accomplished using the panel's built-in RS-232 RJ12 serial communications port (Port 1) or by installing a EA-MG-SP1 Serial Port with DC Power Adapter module (Port 2) to the rear of the panel. The EA-MG-SP1 includes a 15-pin connector that can be connected for RS-232, RS-485 or RS-422.

**Port 1:** If you are using Port 1 then check the Txd and Rxd status indicators on the back side of the panel. They should be on or flashing at a fast rate. If there is activity on the LED indicators, then the panel and PLC are communicating. Location of Port 1's LED status indicators shown to the right.



**Port 2:** If you are using Port 2 then check the Txd and Rxd status indicators on the back side of the EA-MG-SP1 Serial Port with DC Power Adapter. They should be on or flashing at a fast rate. If there is activity on the LED indicators, then the panel and PLC are communicating. Location of Port 2's LED status indicators shown to the right.



On either serial communications port, if there is no activity on one or both TxD and RxD LED status indicators, then:

- Verify that the communication settings are correct in the panel manager
- Test or replace the cable.
- Test the panel or adapter's serial port (Page 5-14 & 5-15).
- Test the serial port on the PLC.

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

Panel & PLC Error Codes

The *C-more* Micro-Graphic panel 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 display any of the errors that the designated PLC would normally generate if there is a problem with the PLC's communications. The PLC generated errors are interpreted by the *C-more* Micro-Graphic programming software and are displayed across the top of the panel's display embedded as a hexadecimal value in error code P499.

If a *C-more* Micro-Graphic communications error does occur, the error message will be displayed in the upper left of the panel's display screen along with the error code number. The error code with error message will blink off and on. A detailed list and description of the various PLC protocol errors can be found in **Appendix A: Panel & PLC Error Code Tables**.

Panel Error Code Table Example:

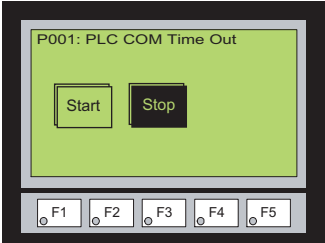
C-more Micro-Graphic Panel Error Table		
Error Code	Error Message	Cause
P001	PLC Com Time Out	A timeout occurred after sending a request to the PLC.
P499	ErrCode Received -> Recv .Err Code XXXX	A PLC generated error code with a hexadecimal value of XXXX has been returned from the PLC.

PLC Error Code Table Example:

PLC Error Codes for <i>Direct</i> LOGIC – ModBus (Koyo)	
Panel Error Code P499 Hex Value	Description
0x1	The function code is unknown by the server.
0x4	The server failed during the execution.

**Note:** See **Appendix A: Panel & PLC Error Code Tables** for a complete list of all error codes.

Panel Communications  
Error Code Example



Micro-Graphic Panel Runtime Errors

The *C-more* Micro-Graphic panel 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 a popup window in the center of the panel’s display. A detailed list and description of the various touch panel runtime errors can be found in **Appendix B: Micro-Graphic Panel Runtime Errors**.

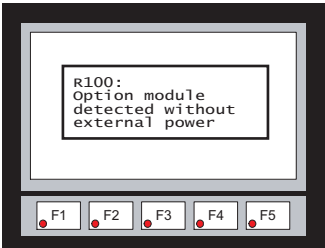
Micro-Graphic Panel Runtime Errors Example:

Micro-Graphic Panel Runtime Errors		
Error Code	Error Message	Cause
R001	PC software tool Timeout	An error between the PC and the panel has caused a communications timeout.
↕	↕	↕
R100	Option module detected without external power	A DC Power Adapter has been installed on the panel with no power supplied to the adapter, but panel is connected to a PC.



**Note:** See **Appendix B: Micro-Graphic Panel Runtime Errors** for a complete list of all error codes.

Runtime Error Popup Window Example



### 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 touch panel.
- Electrical noise can enter the system through the power source for the *C-more* Micro-Graphic panel. Installing a properly wired isolation transformer (neutral grounded) for all AC sources can help the problem, but only if 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, VFOs, etc.

# REPLACEMENT PARTS

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# CHAPTER 9

## In This Chapter...

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<b>Replacement Parts</b> .....	<b>9-2</b>
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Panel Gasket – EA-MG-S3ML-GSK .....	9-2
8-Button Keypad Bezel Mounting Clips – EA-MG-BZ1-BRK .....	9-2
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20-Button Keypad Bezel Mounting Clips – EA-MG-BZ2-BRK .....	9-3
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DC Power Connector – EA-MG--DC-CON .....	9-3
Function Keys Label Inserts – EA-MG-S3ML-FKL .....	9-3
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Replacement Parts Overview

Part Number	Description	Part Number	Description
EA-MG-S3ML-BRK	Replacement mounting clip for <i>C-more</i> Micro-Graphic panels (pk of 2)	EA-MG-S3ML-GSK	Replacement mounting gasket for <i>C-more</i> Micro-Graphic panels
EA-MG-BZ1-BRK	Replacement mounting clip for <i>C-more</i> Micro-Graphic keypad bezel EA-MG-BZ1 (pk of 2)	EA-MG-BZ1-GSK	Replacement mounting gasket for <i>C-more</i> Micro-Graphic keypad bezel EA-MG-BZ1
EA-MG-BZ2-BRK	Replacement mounting clip for <i>C-more</i> Micro-Graphic keypad bezel EA-MG-BZ2 (pk of 6)	EA-MG-BZ2-GSK	Replacement mounting gasket for <i>C-more</i> Micro-Graphic keypad bezel EA-MG-BZ2
EA-MG-DC-CON	Replacement adapter DC power connector for optional EA-MG-P1 and EA-MG-SP1 power adapters used with <i>C-more</i> Micro-Graphic panels (pk of 5)	EA-MG-S3ML-FKL	Replacement function key label insert for <i>C-more</i> Micro-Graphic panels (pk of 10; 5 blank, 5 F1-F5)

Replacement Parts

9

Panel Mounting Clips  
Part No. EA-MG-S3ML-BRK



Panel Gasket  
Part No. EA-MG-S3ML-GSK



8-Button Keypad Bezel Mounting Clips  
Part No. EA-MG-BZ1-BRK



8-Button Keypad Bezel Gasket  
Part No. EA-MG-BZ1-GSK



## Replacement Parts (con'd)

### 20-Button Keypad Bezel

#### Mounting Clips

Part No. EA-MG-BZ2-BRK



(pk of 6)

### 20-Button Keypad Bezel

#### Gasket

Part No. EA-MG-BZ2-GSK



### DC Power Connector

Part No. EA-MG-DC-CON



(pk of 5)

### Function Keys Label Inserts

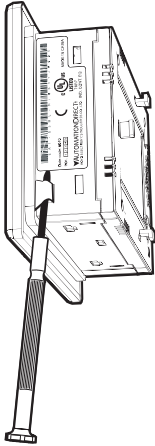
Part No. EA-MG-S3ML-FKL



(pk of 10; 5 blank, 5 F1-F5)

## Customizing the Function Keys Insert Label

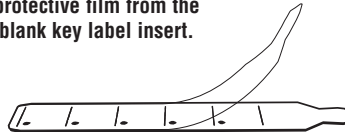
**Step 1 - Remove existing function key label insert using a small tool such as jeweler's screw driver.**



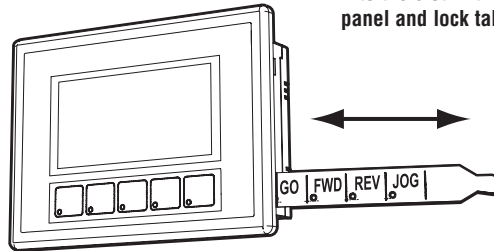
**Step 3 - If desired, print and apply self adhesive labels to the blank insert.**



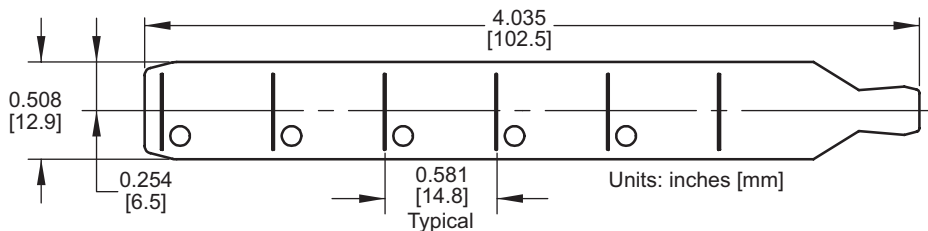
**Step 2 - Remove the protective film from the blank key label insert.**



**Step 4 - Install the new insert into the slot in the side of the panel and lock tab into place.**



**Label Printer Example: Brother P-touch model TZ-131, using TZ black print on clear tape, p/n TZ-131, font: size 24 narrow, 10 spaces between each word.**



**NOTE: Insert shown full size.**



# PANEL & PLC ERROR CODE TABLES

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## APPENDIX

# A

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Introduction

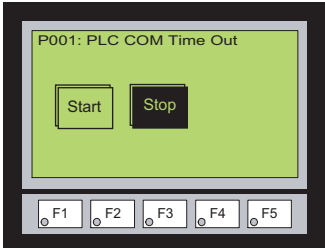
The *C-more*<sup>®</sup> Micro-Graphic panels are capable of communicating over RS232, RS422 and RS485 serial networks. They communicate with all controllers in the *Direct*LOGIC family of PLCs utilizing various protocols, and certain 3rd party PLCs, by using the optional Serial Port with DC Power Adapter, EA-MG-SP1. For a complete list of the supported PLCs and protocols, see the table at the top of page 14 in **Chapter 1: Getting Started**.

As with any network communications, errors will occur. To simplify identification of the cause of the error, we have provided tables describing these errors. If a *C-more* Micro-Graphic panel communications error, or other related data exchange error does occur, the error message will appear across the top of the display screen as shown in the example below. A complete table of the panel generated errors, with their respective error codes, error message, and the cause of the error, are shown on the following two pages.

The *C-more* Micro-Graphic panel also monitors 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. An explanation of how the specific PLC error is identified in the panel error code P499 is shown preceeding the specific manufacturer's PLC error tables. How the hexadecimal error code value is interpreted is slightly different between manufacturers, so it is important to check the explanation at the beginning of each manufacturer's tables.

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

C-more Micro-Graphic Panel Error Example



## C-more Micro-Graphic Panel Error Code Table

The following table includes the error codes and error messages that the panel may display. 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.

<i>C-more</i> Micro-Graphic Panel Error Table		
Error Code	Error Message	Cause
P001	PLC Com Time Out	A timeout occurred after sending a request to the PLC.
P002	NAK Received	A negative acknowledgement (NAK) control code has been generated during a read/write request.
P003	EOT Received	An end of transmission has been sent by PLC in response to a read/write/setbit request.
P004	STX is Not Found	A Start of Text (STX) control code was not found in the data packet received from the PLC.
P005	ETX/ETB NotFound	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.
P006	LRC 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.
P007	CRC 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.
P008	Address NotMatch	The address value returned in the data packet from the PLC is incorrect.
P009	Re.INV.FUN.Code	The function code returned in the data packet from the PLC is incorrect.
P010	DataSizeNotMatch	There are an incorrect number of bytes found in the data packet returned from the PLC.
P011	DataSizeNotMatch	There is an invalid value in the function code.
P012	INVALID COMMAND	There was an invalid command sent to the PLC that wasn't recognized by the PLC.
P013	ENQ Received	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.
P014	TransID NotMatch	This error will be displayed if after checking the Transaction ID Bytes in the data packet, there is no match to what was requested.
P015	%Device% Not Found	A PLC device designated as %Device% could not be found.
P016	DataByte Com.Err	The data part of the packet received contains 0 bytes of data.
P017	Out of Add.Range	The touch panel requested a file number larger than 255.
P019	Parity Error	Panel Detected a parity error
P021	PLC# Not Match	PLC Number does not match configuration
P023	Not Connected	Cable not connected properly
P024	No Other Dev.	Cannot detect other devices on network
P025	PollingList Err.	Panel not in polling list
P028	No Responce	PLC failed to Respond: %PLC Node#%

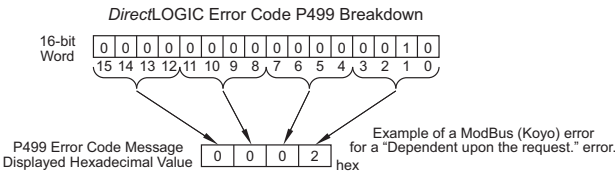
*C-more* Micro-Graphic Panel Error Code Table continued on the next page.

C-more Micro-Graphic Panel Error Code Table (cont'd)

C-more Micro-Graphic Panel Error Table (cont'd)		
Error Code	Error Message	Cause
P499*	ErrCode Received -> Recv .Err Code XXXX	A PLC generated error code with a hexadecimal value of XXXX has been returned from the PLC. * See the explanation for error code P499 proceeding each set of PLC error code tables.
P500	Can'tWriteS.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.
P700	RD.Buff.MEM Full	There was an error while allocating memory for the read buffer. When this error is displayed, a memory leak may have occurred.
P701	INV.PLC Address	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.
P702	INV.FUN.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.
P703	WRT.PLC.ReadOnly	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.

DirectLOGIC Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 various *Direct LOGIC* communication protocols breakdown into a four digit hexadecimal value as shown in the following diagram.



DirectLOGIC PLC Error Code Displayed Example:



## DirectLOGIC – K-Sequence PLC Error Code Table

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



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for <i>DirectLOGIC</i> – K-Sequence	
Panel Error Code P499 Hex Value	Description
01F8	Error setting value.
020D	Error in key mode.
021C	Password protected.

## DirectLOGIC – DirectNET PLC Error Codes

There are no PLC generated errors that occur when using the *DirectNET* protocol.

## DirectLOGIC – Modbus (Koyo) PLC Error Code Table

The following table lists the errors that can be generated by the *DirectLOGIC* PLC when using the Modbus (Koyo) protocol.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for <i>DirectLOGIC</i> – Modbus (Koyo)	
Panel Error Code P499 Hex Value	Description
0x1	The function code is unknown by the server.
0x2	Dependent upon the request.
0x3	Illegal data value dependent upon the request.
0x4	The server failed during the execution.

*DirectLOGIC* error code tables continued on the next page.

# Modbus RTU PLC Error Code Table

The following table lists the errors that can be generated by the *Direct*LOGIC PLC when using the Modbus RTU protocol.

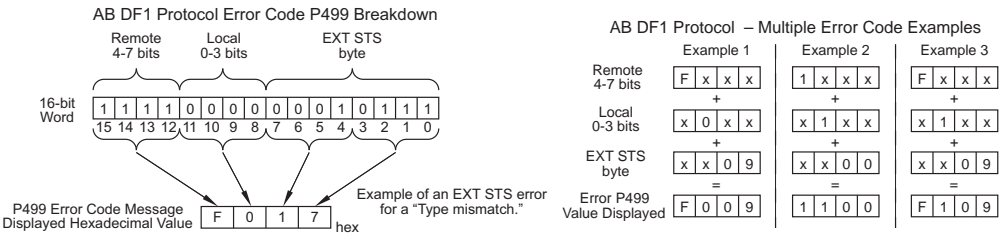


**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Modbus RTU	
Panel Error Code P499 Hex Value	Description
0x1	The function code is unknown to the server.
0x2	Dependent upon the request.
0x3	Illegal data value dependent upon the request.
0x4	The server failed during the execution.

# Allen-Bradley Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 Allen-Bradley DF1 and DH485 communication protocol is 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 PLC Error Code Displayed Example



## Allen-Bradley DF1 Protocol – PLC Error Code Tables

The following PLC error tables cover possible errors that are detected by the panel from Allen-Bradley PLCs using the DF1 protocol. This includes full and half duplex communications for the MicroLogix 1000, 1100, 1200 & 1500, SLC 5/03, /04, /05, ControlLogix, CompactLogix and FlexLogix, and full duplex communications for the PLC5.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

**PLC Errors for Allen-Bradley DF1 Protocol, Local STS Errors (0-3 bits)**

Panel Error Code P499 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 Protocol, Remote STS Errors (4-7 bits)**

Panel Error Code P499 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
<b>0xF0</b>	<b>Error code in the EXT STS byte. See the error code table on the next page.</b>

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

## Allen-Bradley DF1 Protocol – PLC Error Code Tables (cont'd)

PLC Errors for Allen-Bradley DF1 Protocol, EXT STS Command Code for F0 Command	
Panel Error Code P499 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	Reserved
0x1D	Reserved
0x1E	Data table element protection violation.
0x1F	Temporary internal problem.



## Allen-Bradley DH485 Protocol – 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 DH485 protocol. This includes all MicroLogix and SLC500 PLCs, 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** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

**PLC Errors for Allen-Bradley DH485 Protocol, Local STS Errors (0-3 bits)**

Panel Error Code P499 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 DH485 Protocol, Remote STS Errors (4-7 bits)**

Panel Error Code P499 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.

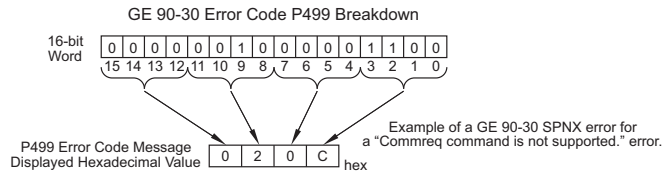
(PLC generated error codes for the Allen-Bradley DH485 protocol continued on the next page.)

Allen-Bradley DH485 Protocol – PLC Error Code Tables (cont'd)

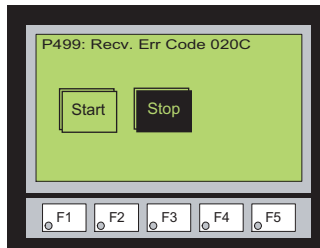
PLC Errors for Allen-Bradley DH485 Protocol, EXT STS Command Code for F0 Command	
Panel Error Code P499 Hex Value	Description
0x7	Insufficient memory module size (0000h is returned).
0xB	Access denied; privilege violation.
0xC	Resource not available or cannot do.
0xE	CMD cannot be executed.
0x12	Invalid parameter.
0x14	Failure during processing.
0x19	Duplicate label.
0x1A	File open by another node + owner's local node address, 1 byte.
0x1B	Program owned by another node + program owner's local node address, 1 byte.

## GE Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 GE 90-30, 90-70, Micro 90 and VersaMax Micro SNPX communication protocols breakdown into a four digit hexadecimal value as shown in the following diagram.



### GE Error Code P499 Message Example:



## GE SNPX Protocol – PLC Error Code Tables

The following table lists the errors that can be generated by the GE 90-30, 90-70 and VersaMax PLC when using the SNPX protocol.



**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Errors for GE SNPX Protocol (Major)	
Panel Error Code P499 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 successfully 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 used 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 the remote SNP device.
0x290C	A received SNP message has been NAKed the maximum number of two times. The NAKed message may be retransmitted a maximum of two times.

(PLC generated error codes for the GE 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)



## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 CMM module 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 Hex Value	Description
0x8DOA	Bad DOS Version. Must have DOS 2.0, or later, to support the SNP DOS Driver.
0x8EOA	PC Serial port configured for SNP Master driver is not open; no communication can take place.
0x8FOA	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 Fanuc 90-30, 90-70 and VersaMax SNPX protocol continued on the next page.)

## GE SNPX Protocol – PLC Error Code Tables (cont'd)

A

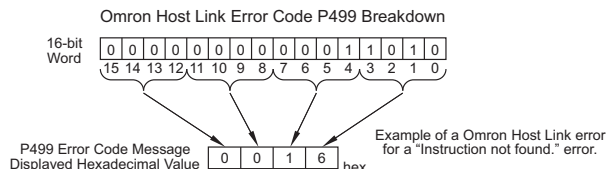
PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd)	
Panel Error Code P499 Hex Value	Description
0xE005	Service in process cannot login.
0xE105	No I/O configuration to read or delete.
0xE205	IOS could not delete configuration, or bad type.
0xE305	CPU revision number does not match.
0xE405	Memory Type 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 Micro-Graphic Panel Error Code Table shown on page A-3 can occur when using the Mitsubishi FX protocol, there are no PLC generated errors.

## Omron Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 Omron Host Link communication protocols breakdown into a four digit hexadecimal value as shown in the following diagram.



### Omron Error Code P499 Message Example:



## 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 Micro-Graphic** panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Omron Host Link	
Panel Error Code P499 Hex Value	Description
0x00	Normal Completion.
0x01	Not executable in RUN mode.
0x02	Not executable in MONITOR mode.
0x03	Not executable with PROM mounted.
0x04	Address over (data overflow).
0x0B	Not executable in PROGRAM mode.
0x0C	Not executable in DEBUG mode.
0x0D	Not executable in LOCAL mode.
0x10	Parity error.
0x11	Framing error.
0x12	Overrun.
0x13	FCS error.
0x14	Format error (parameter length error).
0x15	Entry number data error (parameter error, data code error, data length error).
0x16	Instruction not found.
0x18	Frame length error.
0x19	Not executable (due to Un-executable error clear, non-registration of I/O table, etc.).
0x20	I/O table generation impossible (unrecognized remote I/O unit, channel over, duplication of optical transmitting I/O unit).
0xA0	Abort due to parity error in transmit data under process.
0xA1	Abort due to framing error in transmit data under process.
0xA2	Abort due to overrun in transmit data under process.
0xA3	Abort due to FCS error in transmit data under process.
0xA4	Abort due to format error in transmit data under process.
0xA5	Abort due to frame length error in transmit data under process.
0xA8	Abort due to entry number data error in transmit data under process.
0xB0	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 Micro-Graphic** panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active. Please refer to the PLC manufacturer's documentation for additional information.

PLC Error Codes for Omron FINS	
Panel Error Code P499 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.)

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

PLC Error Codes for Omron FINS	
Panel Error Code P499 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.)



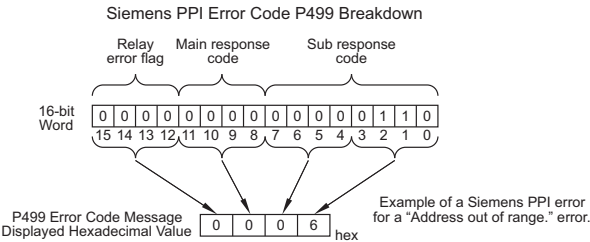
## Omron FINS Protocol – PLC Error Code Table (cont'd)

PLC Error Codes for Omron FINS	
Panel Error Code P499 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.

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

# Siemens Error Code P499 Explanation

The P499 error code is used to show any errors that are generated by the connected PLC. The P499 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 diagram.



## Siemens Error Code P499 Message Example:



## Siemens PPI Protocol – PLC Error Code Table

PLC PDU Header Errors for S7-200 PPI	
Panel Error Code P499 Hex Value	Description
0x0001	Hardware Fault.
0x0003	Object access not allowed.
0x0004	Context not supported.
0x0005	Address out of range.
0x0006	Address out of range.
0x0007	Write Data size mismatch.
0x000A	Object 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.

# **MICRO-GRAPHIC PANEL RUNTIME ERRORS**

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Introduction

The *C-more*<sup>®</sup> Micro-Graphic panel 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 a popup window in the center of the panel’s display.

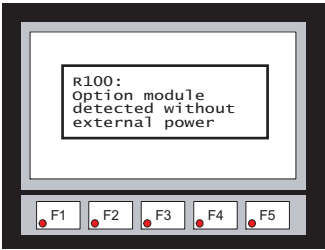
If you have difficulty determining the cause of the error, refer to **Chapter 8: Troubleshooting** for additional help or contact our technical support group at 770-844-4200

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 increments, 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.

Micro-Graphic Panel Runtime Errors		
Error Code	Error Message	Cause
R001	PC software tool Timeout	An error between the PC and the panel has caused a communications timeout.
R002	CRC Error occurred during project transfer from PC.	A CRC error has occurred when the project file was transferred between PC and Panel.
R003	Project Check Sum Error. Resend Project file to Panel.	The project check sum failed.
R100	Option module detected without external power	A DC Power Adapter has been installed on the panel with no power supplied to the adapter, but panel is connected to a PC.

Runtime Error Popup Window Example



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