



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

## Hardware User Manuals

*EA1-TCL-M,  
EA1-MG6-USER-M,  
EA1-MG-USER-M*





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## 6-inch Color Micro-Graphic Panel

### Hardware User Manual

EA1-TCL-M

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



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



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



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







# Graphic Color Panel - 6 Inch EA1-T6CL

## 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*® Micro-Graphic family of products. This manual describes *AutomationDirect.com's C-more* 6" Color Micro-Graphic panels, 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 aid 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.

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# 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

1



**EA1-T6CL**

*shown in Landscape (Horizontal) mode*



**EA1-T6CL**

*shown in Portrait (Vertical) mode*

The *C-more* 6" Color Micro-Graphic panel has a 5.7-inch TFT LCD color 320 x 240 dot display with an LED backlight. It features five user-defined function keys, each key with a user-defined red LED indicator. The panel displays up to 40 lines by 80 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 60 characters and 53 lines of static text and 40 lines by 40 characters of dynamic text. EA1-T6CL is rated UL for use on a flat surface of Type 1, 4X enclosure (for indoor use only). The *C-more* 6" Micro-Graphic panels are powered from a 12-24 VDC power supply during operation, or can be powered in low power mode thru the USB port from a PC during programming.

Other features include:

- 3276 KB memory
- USB Type B programming port with internal USB to RS-232 converter.
- Built in 15-pin serial communications port (RS-232/422/485)
- 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

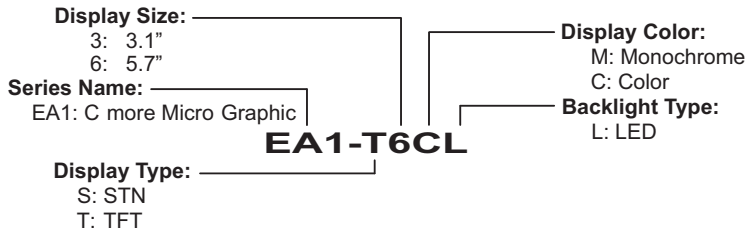
| UL/CUL/CE Certification Numbers           |         |         |           |          |
|---|---------|---------|-----------|----------|
| Name                                      | UL/CUL  | UL508   | CE        | ISO-9000 |
| C-more Micro-Graphic Panels & Accessories | E157382 | E157382 | EN61131-2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



## Part Number Key

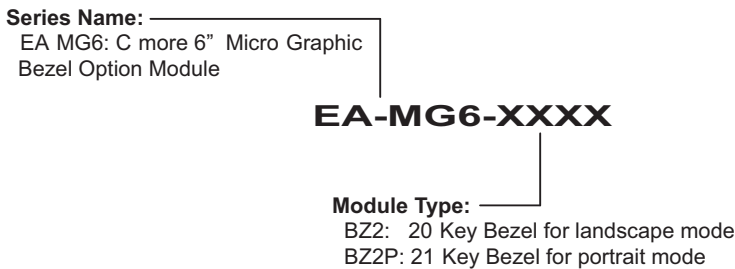
### Panel Part Number Key

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



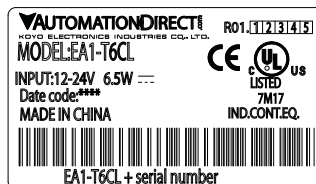
### Bezel Part Number Key

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



## Product Label Example:

EA1-T6CL



## 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)

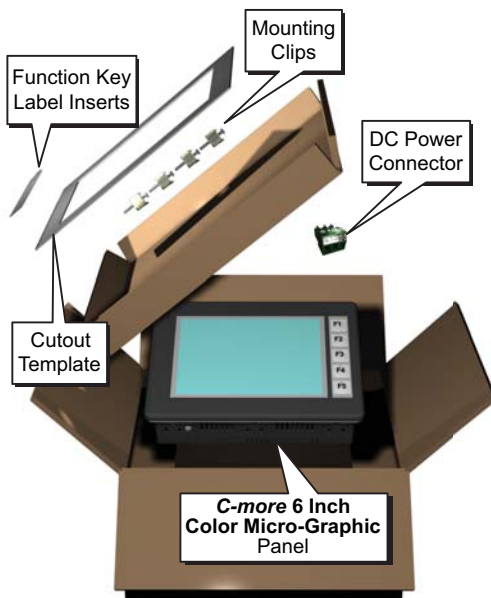
# Quick Start Steps

1

### Step 1 – Unpack and Inspect

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

- *C-more* 6" Color Micro-Graphic panel (EA1-T6CL)
- DC power connector (EA-MG-DC-CON)
- cutout template
- mounting clips (EA-MG-BZ2-BRK)
- gasket (EA-MG6-S6ML-GSK)
- function key label inserts (EA-MG6-S6ML-FKL)
- Quick Start Guide (EA1-MG6CL-QSG)



**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**



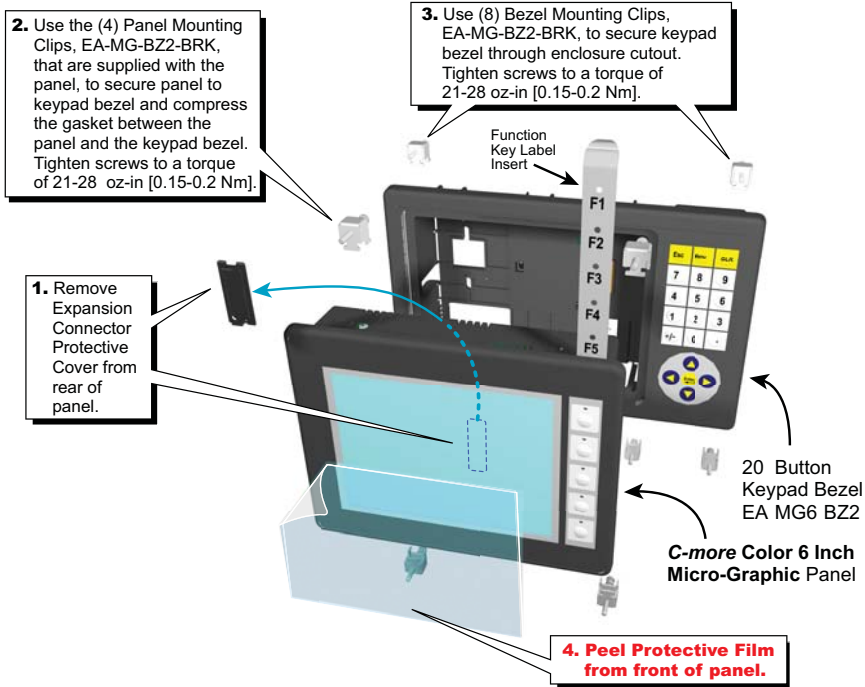
**21-Button Vertical Keypad Bezel  
EA-MG6-BZ2P**





## 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

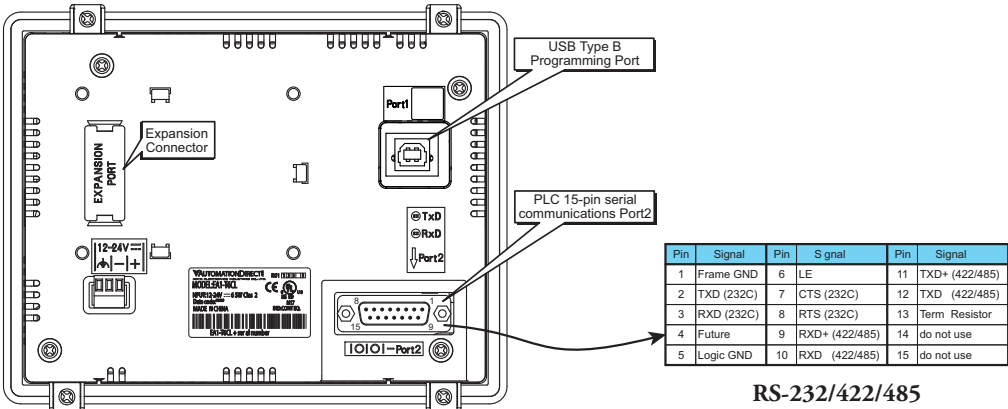
See Chapter 3, Accessories



### Step 3 – Become Familiar with Available Communication Ports

The *C-more* 6" Color Micro-Graphic panel includes a built-in USB Type B port used to communicate with a PC during project development. There is a 15-pin RS-232/RS-422/RS-485 port for communications to a PLC.

**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.



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

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

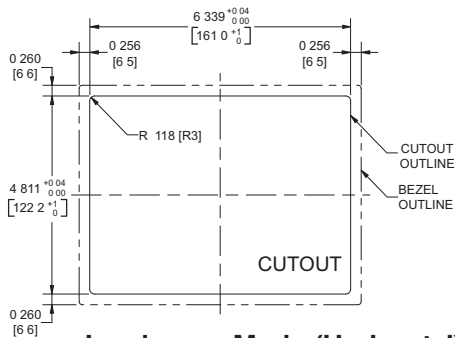
The *C-more* 6" Micro-Graphic panel can be mounted through a cutout in an enclosure by using the template that is provided with the panel, or using the dimensions shown below. Cutout dimensions for the 20-button landscape and 21-button portrait keypad bezel options are also shown below. The keypad bezels 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].

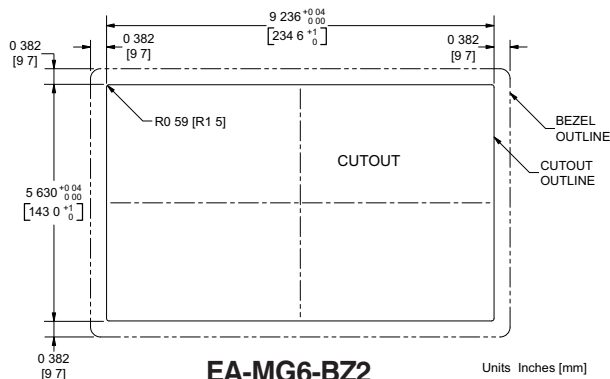
See **Chapter 2: Specifications** for additional product dimensions.

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

### EA1-T6CL Panel Cutout

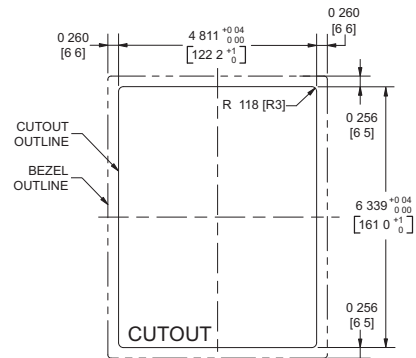


**Landscape Mode (Horizontal)**

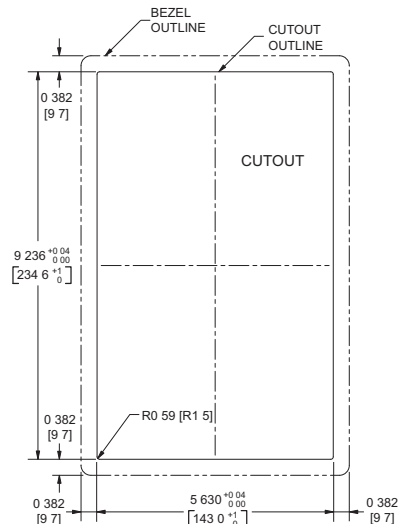


**EA-MG6-BZ2  
Landscape (Horizontal)  
Keypad Bezel Cutout**

Units: Inches [mm]



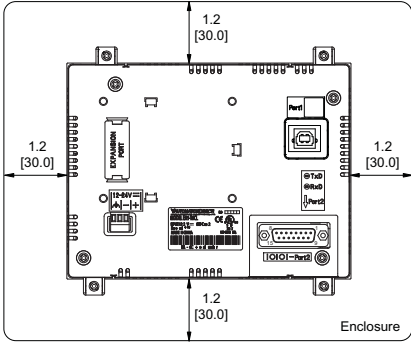
**Portrait Mode (Vertical)**



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

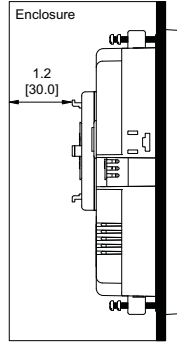
# Enclosure Clearances

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

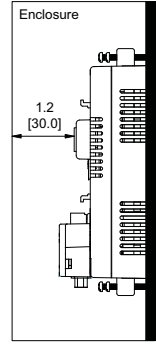


units: inches [mm]

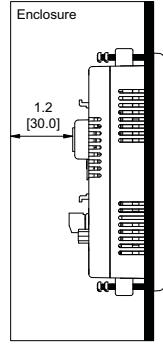
**EA1-T6CL**  
**Rear View**



**EA1-T6CL with**  
**EA-MG6-BZ2(P)**



**EA1-T6CL with**  
**EA-ADAPTR-4**

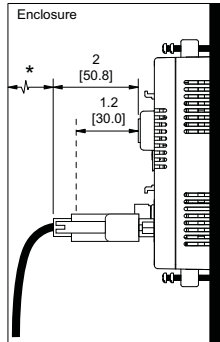


**EA1-T6CL**

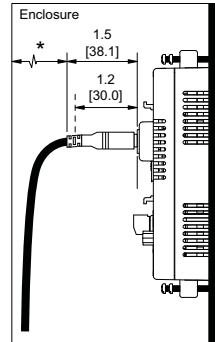


**NOTE:** Additional clearance inside the enclosure is required when connecting to the 15-pin serial communications port (Port2) unless the 90 EA-ADPTR-4 is used.

\* Additional clearance for cable bend radius typically 1/2" to 1"



**EA1-T6CL with**  
**EA-2CBL**



**EA1-T6CL with**  
**USB programming**  
**cable**



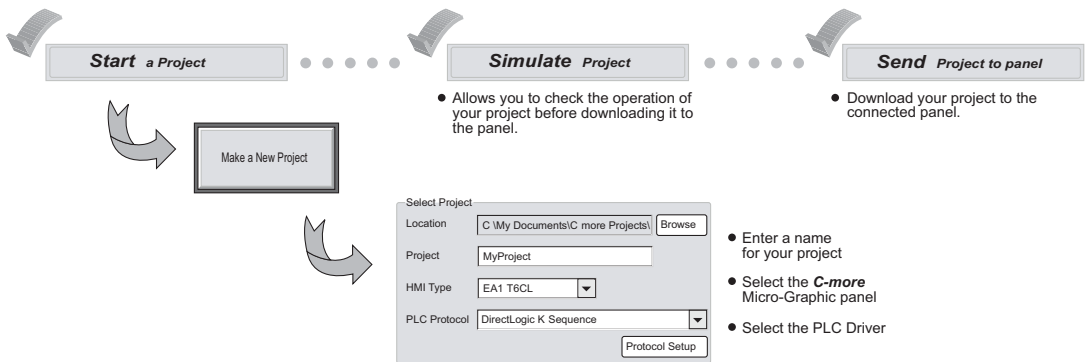
**NOTE:** Cable connectors are typically longer than 1.2" (30mm). Therefore, in addition to ventilation requirements, clearance must account for the connector and the cable bend radius.

## 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; 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); 512 MB free RAM (1GB recommended) for Vista
- CD-ROM or DVD drive for installing software from the CD, or internet access to download free programming software
- USB port to use with a USB-CBL-AB6 programming cable 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 *C-more* Micro-Graphic Programming Software CD-ROM into the PC's CD-ROM drive or download the programming software from [www.automationdirect.com](http://www.automationdirect.com) 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.



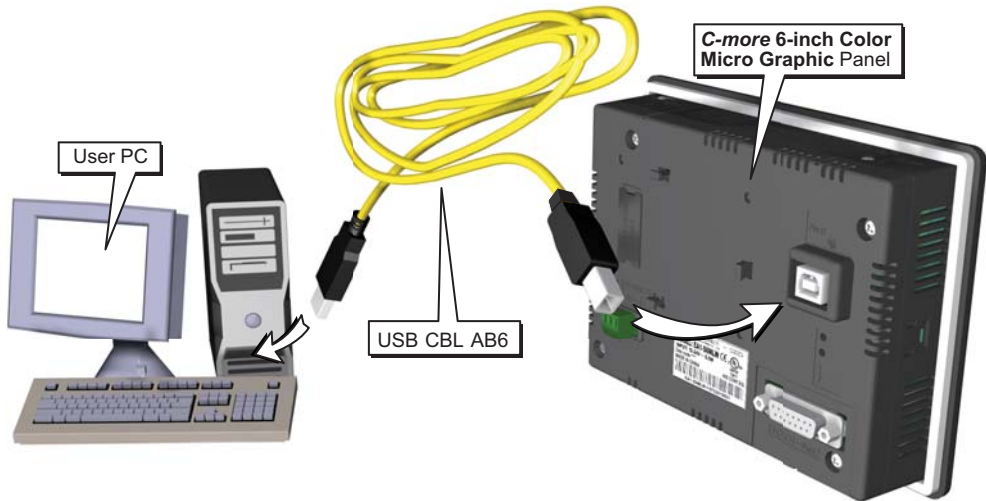
**NOTE:** The panel has an internal USB to serial converter at Port1. When the device is properly installed and the USB programming cable connects the panel to the PLC, the port will be identified as a serial communications port with an assigned COM port number.

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

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

Use a programming cable such as USB-CBL-AB6 from a USB port type A on the project development PC to the USB port type B on the *C-more 6”* Color Micro Graphic Panel as shown below. Any standard Type A to Type B USB cable can be used such as a standard USB printer cable, maximum length 15’.

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



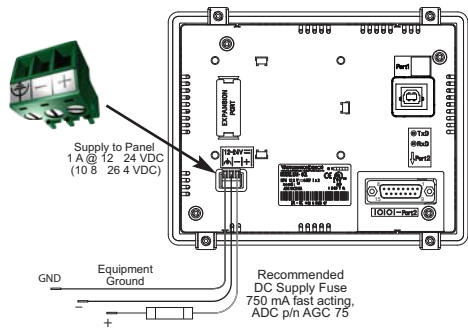
**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.

Step 7 – Providing Power to the *C-more 6"* Color Micro-Graphic Panel

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

- 1). The panel is powered by a 1 Amp @ 12-24 VDC power source in normal operation.
- 2). The *C-more 6"* Micro-Graphic panel can be powered during programming from the PC through a USB Programming Cable such as USB-CBL-AB6. When powered from the PC, the panel will operate in Low-Power mode and the screen brightness is diminished.

Panel Powered from a DC Power Source - Wiring Diagram



| Tightening Torque            |                    |
|------------------------------|--------------------|
| Power supply wire connection | 1 7 lb-in (0.2 Nm) |

| Required Wire Specification |             |
|-----------------------------|-------------|
| Supported temperature       | Over 60 °C  |
| Wire Material               | Copper      |
| Wire Size                   | 16 - 22 AWG |



**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” Color Micro-Graphic Panel Setup Screens

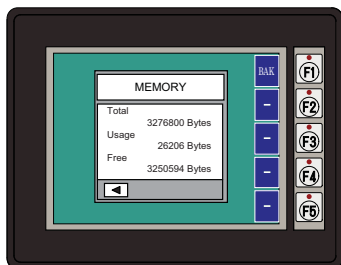
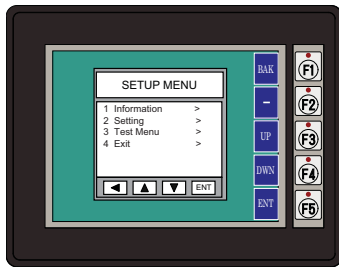
To access the Setup Menu of the panel's setup screens, press the the BAK [F1] and ENT [F5] function keys simultaneously for three (3) seconds.



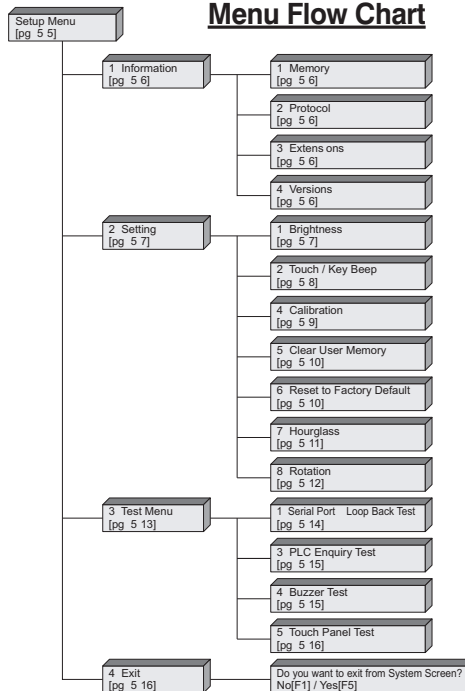
From the Setup Menu, information about the panel can be obtained, settings can be adjusted, and panel functions can be tested.



**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** Color Micro-Graphic Panel to PLC Protocol & CablesAvailable PLC Protocols

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

Available purchased cables

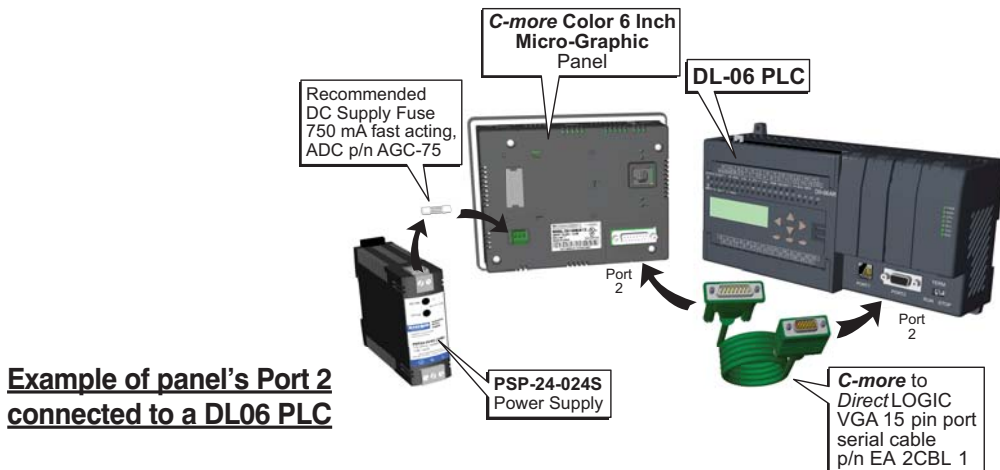
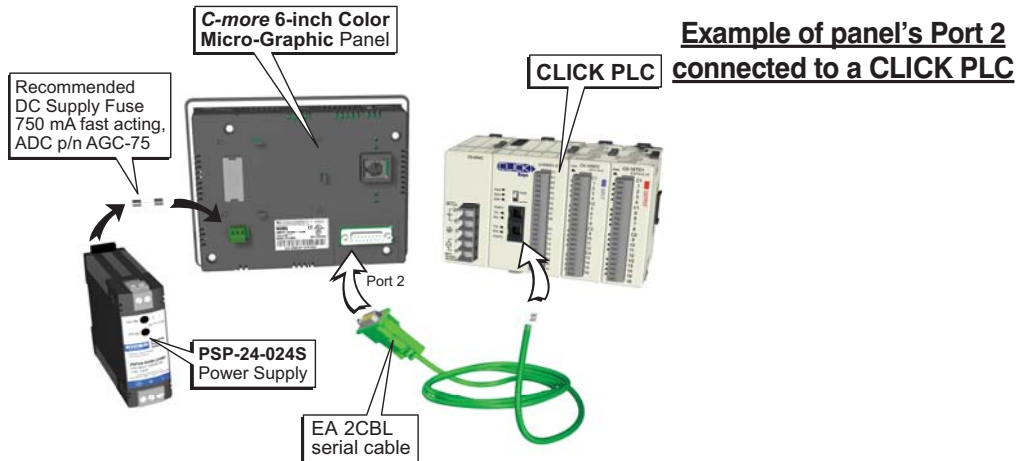
| Cable Description  | Cable Part No.         |
|--|------------------------|
| <b><i>Cables used with serial Port2</i></b>  |                        |
| AutomationDirect CLICK, <b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C) | <b>EA-2CBL</b>         |
| <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” Color 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 15-pin serial communications port with either RS-232, RS-422 or RS-485 communications.



# SPECIFICATIONS

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## In This Chapter...

|                              |     |
|------------------------------|-----|
| Available Models .....       | 2-2 |
| Model Specifications .....   | 2-3 |
| Panel Dimensions .....       | 2-5 |
| Communications Port .....    | 2-6 |
| Chemical Compatibility ..... | 2-7 |

Available Models

The *C-more* 6" Color 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. See **Chapter 3: Accessories** for details on the available accessories for the *C-more* 6" Color Micro-Graphic panels.

| C-more Color 6" Micro-Graphic Panels |   |  |
|--------------------------------------|---|--|
| Part Number                          |   | Description  |
| EA1-T6CL                             |  | 6-inch <i>C-more</i> Micro-Graphic Touch Panel with TFT Color LCD, 320 x 240 dot, 32,768 color display with LED backlight. 5 user-defined function keys with LED indicators. Two built-in ports (USB Type-B port and 15-pin D-sub RS-232/422/485 port). Display supports portrait and landscape modes. NEMA 4/4X, IP65 (when mounted correctly; for indoor use only) |

C-more 6" Color  
Micro-Graphic Panel



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



## Model Specifications

| Specifications                   |  |                 |
|----------------------------------|--|-----------------|
| Description:                     | 320 x 240 dots LCD display (Landscape Mode),<br>Five user defined keypad function buttons, and five user defined LED's |                 |
| Display:                         |  |                 |
| • Type                           | 5.7" TFT Color LCD, graphical characters   |                 |
| • Resolution                     | 320 (W) x 240 (H) dots (Landscape Mode)<br>240 (W) x 320 (H) dots (Portrait Mode)                                      |                 |
| • Color                          | 32768 colors   |                 |
| • Display Brightness (Reference) | USB Bus Power (Programming)  | High Power Mode |
|                                  | 45 nits (typ)  | 270 nits (typ)  |
| • Viewing Area Size              | 4.574" (W) x 3.483" (H) [116.2 mm x 87.4 mm]   |                 |
| • Active Area Size               | 4.535" (W) x 3.400" (H) [115.2 mm x 86.4 mm]   |                 |
| • Brightness                     | Adjusted from the panel's built-in configuration setup menu  |                 |
| • Viewing Angle                  | 3, 9 o'clock axis → 50 degrees<br>6 o'clock axis → 50 degrees<br>12 o'clock axis → 45 degrees                          |                 |
| Backlight:                       |  |                 |
| • Type                           | LED  |                 |
| • Color                          | White  |                 |
| • User Replaceable               | No   |                 |
| Touch Screen:                    |  |                 |
| •Type                            | Analog touch panel   |                 |
| • Operation                      | 82 gram force [0.8 N] maximum  |                 |
| • Life                           | Minimum of 1,000,000 cycles  |                 |
| Features:                        |  |                 |
| • User Memory                    | 3276 kBytes  |                 |
| • Number of Screens              | Up to 999 – limited by project memory usage  |                 |
| • Beep (Internal)                | Yes  |                 |
| • Keypad Function Buttons        | Five user defined function key buttons with the ability to custom label with an overlay.<br>Minimum of 500,000 cycles  |                 |
| • Keypad Function Button LEDs    | Each function key button includes a red LED that can be user programmed.   |                 |
| • Programming Port               | USB Type B (USB 2.0 full speed mode 12 Mbps)   |                 |
| • Serial Communications          | 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   |                 |

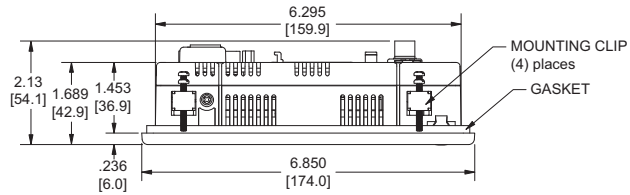
Specification table continued at the top of the next page.

## Model Specifications (cont'd)

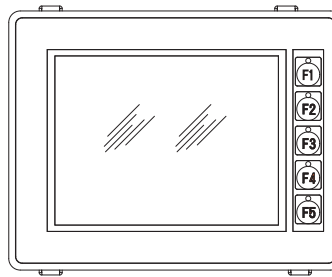
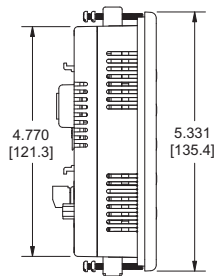
| Specifications (cont'd)                   |   |  |
|---|---|--|
| Screen Objects:                           |   |  |
| • Functional Devices                      | Push Button, Switch, Indicator Button, Indicator Light, Graphic Indicator Light, Numeric Display, Numeric Entry, Inc/Dec Value, Bar Graph, Bitmap Button, Static Bitmap, Dynamic Bitmap, Recipe Button, Static Text, Lookup Text, Dynamic Text, Screen Change Push Button, Screen Selector, Adjust Contrast, Function, Key Configuration Object, Real Time Graphics 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:                               |   |  |
|   | USB Bus Power (Programming)   | 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 from a PC USB.   | Supplied from an external 12-24 VDC power source                 |
| • Power Consumption                       | 2W  | 6.5 W  |
| • Recommended Fuse                        | No fuse required when directly connected to a PC with recommended cable.  | Type AGC fast acting glass fuse, 750 mA, 250 VAC, ADC p/n AGC-75 |
| • Max.Inrush Current                      | 4.5 A for 800 µs  | 13 A for 800 µs  |
| • Acceptable External Power Drop Duration | Maximum 1 ms  |  |
| Environmental:                            |   |  |
| • Operating Temperature                   | 0 to 50 °C (32 to 122 °F)<br>Maximum surrounding air temperature rating: 50 °C  |  |
| • Storage Temperature                     | –20 to +60 °C (–4 to +140 °F)   |  |
| • Humidity                                | 5–95% RH (non-condensing)   |  |
| • Environmental Air                       | For use in Pollution Degree 2 environment   |  |
| • Vibration                               | IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>Impulse 1000 V @ 1 µs pulse  |  |
| • Enclosure                               | For use on a flat surface of Type 1, 4X enclosure (Indoor 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 2.130" (D) [174.0 mm x 135.4 mm x 54.1 mm] (Landscape Mode)<br>5.331" (W) x 6.850" (H) x 2.130" (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]   |  |
| • Weight                                  | 29.63 oz. (840 g)   |  |

# Panel Dimensions

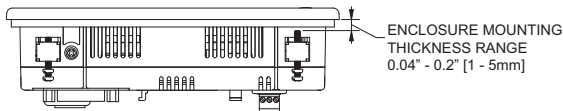
## Panel Dimensions



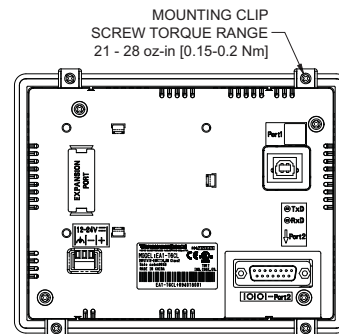
Units: Inches [mm]



## Enclosure Thickness

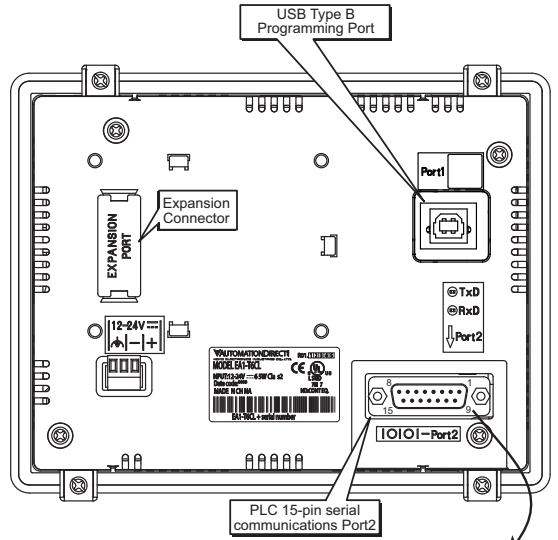


## Mounting Clip Screw Torque



# Communications Port

2



| 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   | Future     | 9   | RXD+ (422/485) | 14  | do not use     |
| 5   | Logic GND  | 10  | RXD (422/485)  | 15  | do not use     |

RS-232/422/485



## 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 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 of the materials and therefore information of compatibility is not available.

| Chemicals                     | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[Density %, Temperature °C] |
|---------------------------------------|--|--|--|--|
| Ammonia liquid                        |  | Good                                       |  |  |
| Ammonia water                         |  | [12%] Not Usable                           |  |  |
|                                       |  | [28%] Not Usable                           |  |  |
| Ammonium carbonate                    |  | Excellent                                  |  |  |
| Ammonium chloride                     |  | Excellent                                  |  |  |
| Ammonium hydroxide<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet–<br>PET<br>[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                     |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

| Chemicals                       | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Hypos] |  | Excellent                                  |  |  |
| Dibutyl phthalate<br>[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                                  |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

| Chemicals         | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[Density %, Temperature °C] |
|-------------------|--|--|--|--|
| Ethylene oxide    |  | Not Usable                                 |  |  |
| Fatty acid        |  | Good                                       |  |  |
| Ferric chloride   |  | Excellent                                  |  |  |
| Ferric nitrate    |  | Excellent                                  |  |  |
| Ferric sulfate    |  | Excellent                                  |  |  |
| Fluoroboric 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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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]<br>Not Recommended              |  |  |
|                               |  | [5-50, 20 °C]<br>Not Recommended           |  |  |
|                               |  | [30, 20 °C] Not Usable                     |  |  |
| Hydrogen sulfide              |  | Excellent                                  |  |  |
| Hydorquinone                  |  | 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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[Density %, Temperature °C] |
|-------------------------------|--|--|--|--|
| Mercuric chloride             |  | Excellent                                  |  |  |
| MEK                           | Not Usable                                       |  |  | Good   |
| Mercury                       |  | Excellent                                  |  |  |
| Metacresol                    |  |  |  | Not Usable   |
| Methyl acetate                |  | Not Usable                                 |  |  |
| Methyl alcohol                |  | Not Recommended                            |  | Excellent  |
| Methyl Benzoate               |  |  |  | Not Usable   |
| Methyl chloride               | Not Usable                                       | 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                   |  | [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                     |  |  |
| Nitrobenzene                  |  | Not Usable                                 |  | Not Usable   |
| Nitroethane                   |  | Not Usable                                 |  |  |
| Nitromethane                  |  | Not Usable                                 |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

| Chemicals              | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C]            | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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 permanganate |  | [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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Glauber's salt] |  | Good                                       |  |  |
| Sodium sulfite                     |  | Excellent                                  |  |  |
| Soybean oil                        |  | Excellent                                  |  |  |
| Stannic chloride                   |  | Good                                       |  |  |
| Steam                              |  | [below 150 degrees]<br>Not Usable          |  |  |
| Steam                              |  | [above 150 degrees]<br>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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key – PET<br>[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<br>[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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## 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 sold separately. Downloadable version available from the Web site at no charge. Software Help Files included in download. |
| USB-CBL-AB6  |  | Standard USB 2.0 cable with Standard-A plug to Standard-B plug, suitable for all USB devices. 6 ft. (1.8 m) cable shown as example. Maximum cable length is 15 ft (4.5 m).   |

| 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 2.5 or later is required with models EA1-T6CL. 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

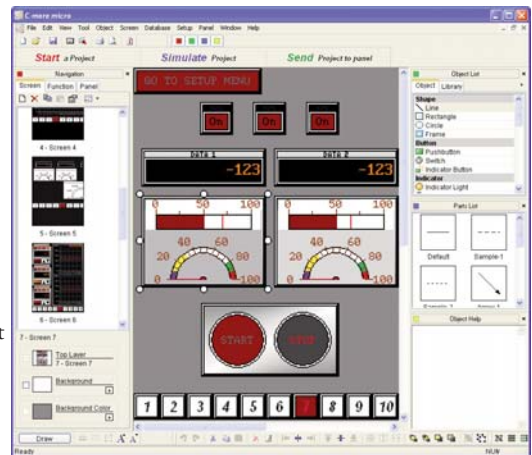
Lets you find the object you want fast. Just drag and drop it on the screen.

### 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 6™** 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; 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); 512 MB free RAM (1GB recommended) for Vista
- 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




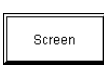

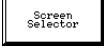

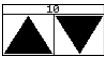
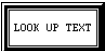

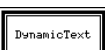
# Micro-Graphic Programming Software (cont'd)

## 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>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. One point is added at each refresh.  |         |
| 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 line is drawn in its entirety at each refresh.  |         |
| 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 Graph</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 Graph 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 C-more 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   |
| 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>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>Multi-State Bitmap</b> object is added in version 2.50 and later. The Multi-State Bitmap displays one of up to 16 images based on the status of a tag value assigned to each image. It can be used to create animation.  |   | 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.   |  |
| <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>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>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>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>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>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. |  |
| 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. |  |   |   |

## 20-Button Landscape (Horizontal) Keypad Bezel

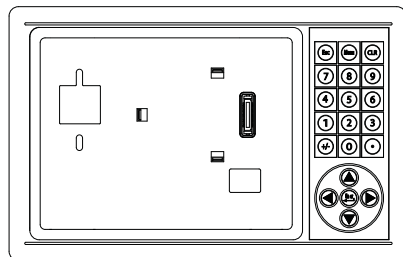
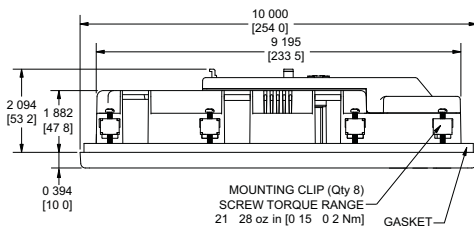
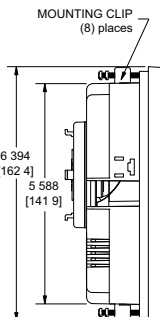
The 20-button keypad bezel is designed to be used with the *C-more* 6" Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, a full numeric keypad, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object to allow 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

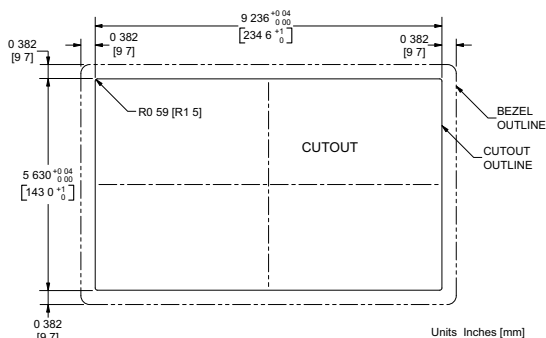


### Dimensions

Units: Inches [mm]

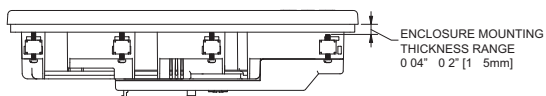


### Panel Cutout



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      | EA1-S6ML, EA1-S6MLW, EA1-T6CL  |
| • Connection                          | Connects with expansion connector on the rear of the C-more 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)<br>Maximum surrounding air temperature rating: 50 °C   |
| • Storage Temperature                 | -20 to 60 °C (-4 to 140 °F)  |
| • Humidity                            | 5 to 95 % RH (non-condensing)  |
| • Environmental air                   | For use in Pollution Degree 2 environment  |
| • Vibration                           | IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>Impulse 1000 V @ 1 µs pulse   |
| • Enclosure                           | For use on a flat surface of Type 1, 4X enclosure (Indoor 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)<br>[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

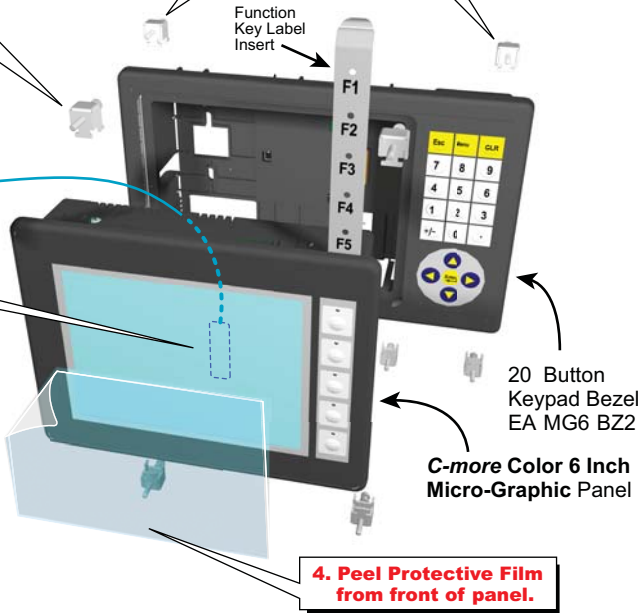
3

**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.

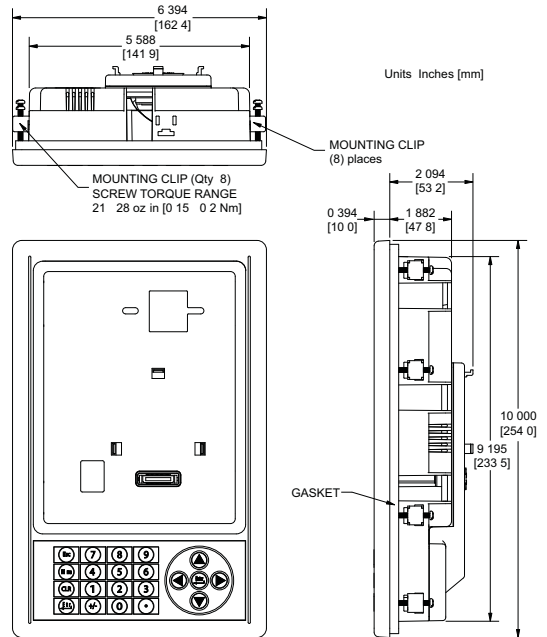
## 21-Button Portrait (Vertical) Keypad Bezel

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.

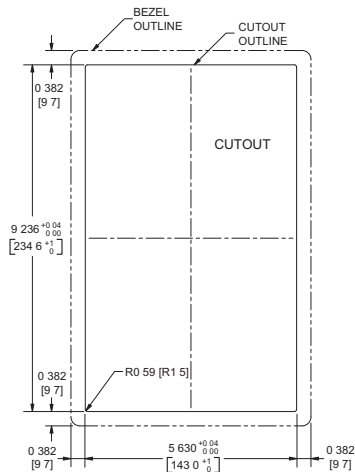
### EA-MG6-BZ2P



### Dimensions

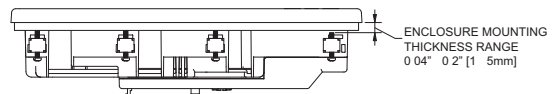


### Panel Cutout



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      | EA1-S6ML, EA1-S6MLW, EA1-T6CL  |
| • Connection                          | Connects with expansion connector on the rear of the C-more 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 C-more 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)<br>Maximum surrounding air temperature rating: 50 °C   |
| • Storage Temperature                 | -20 to 60 °C (-4 to 140 °F)  |
| • Humidity                            | 5 to 95 % RH (non-condensing)  |
| • Environmental air                   | For use in Pollution Degree 2 environment  |
| • Vibration                           | IEC60068-2-6 (Test Fc), 5-9 Hz: 3.5 mm amplitude, 9-150 Hz: 1.0G, 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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>Impulse 1000 V @ 1 µs pulse   |
| • Enclosure                           | For use on a flat surface of Type 1, 4X enclosure (Indoor 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)<br>[162.4 mm x 254.0 mm x 63.2 mm]   |
| • Weight                              | 26.1 oz. [740 g]   |

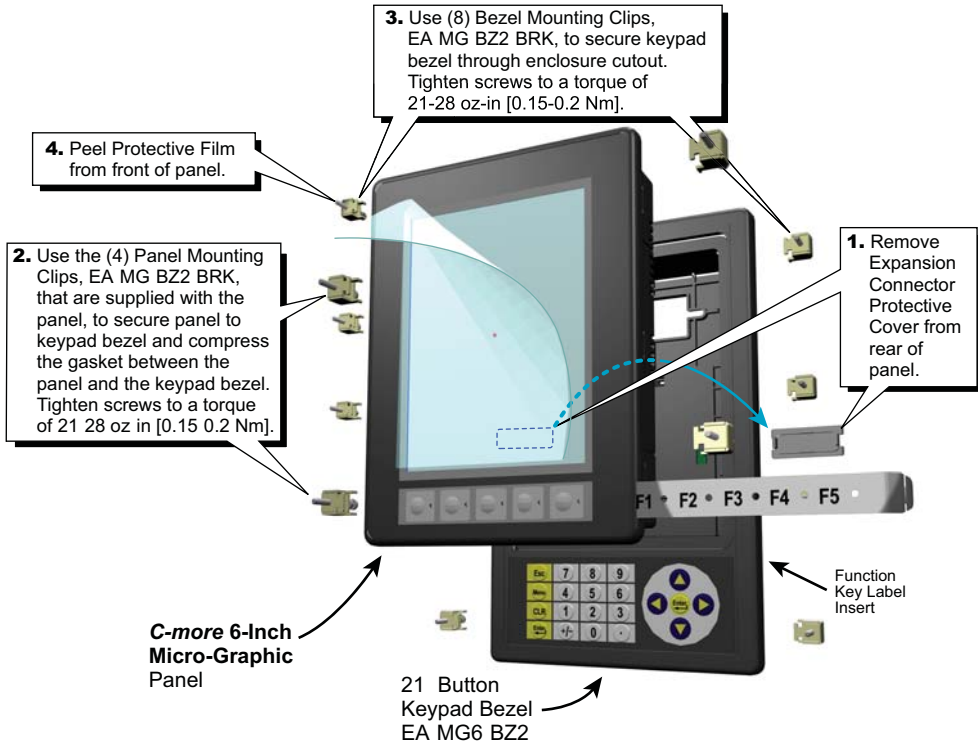
*C-more 6" Micro Graphic Panel  
installed in a 21 button Keypad  
bezel EA-MG6-BZ2P*



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

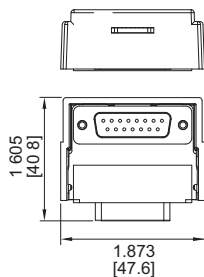


**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

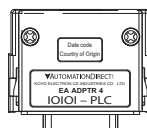
## D-SUB 15-pin 90-degree Communication Port Adapter

The EA-ADPTR-4 adapter plugs into the 15-pin serial port on the rear of the 6" 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.

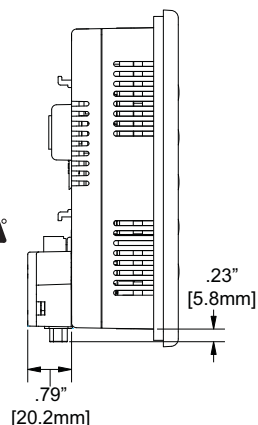
### EA-ADPTR-4



Units: inches [mm]

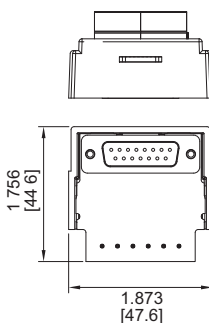


### Dimensions

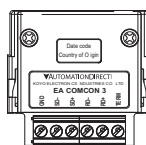
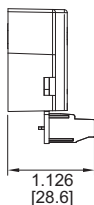


## D-SUB 15-pin to Terminal Block Adapter

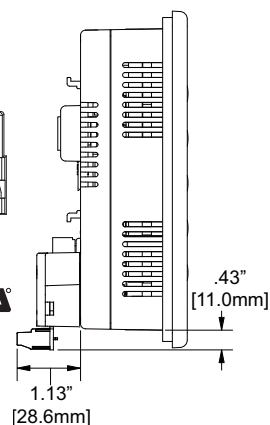
The EA-COMCON-3 adapter plugs into the 15-pin serial port on the rear of the 6" panel to allow wire terminal connections for an RS-422/RS-485/DH-485 PLC communication cable. UL Recognized.



Units: inches [mm]



### Terminals



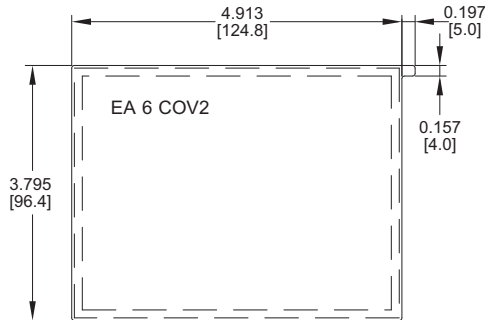
## Clear Screen Overlay

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

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## CHAPTER 4

### In This Chapter...

|                               |     |
|-------------------------------|-----|
| Safety Guidelines .....       | 4-2 |
| Introduction .....            | 4-3 |
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# 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.

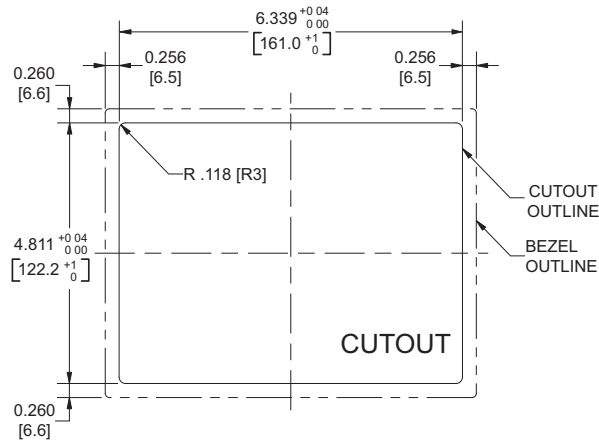
### Mounting Clips EA-MG-BZ2-BRK



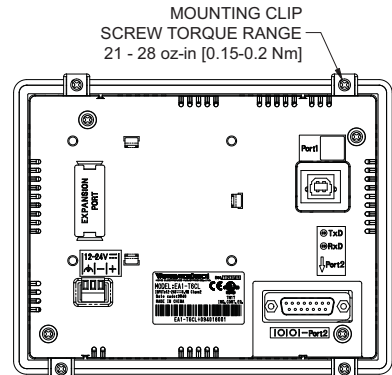
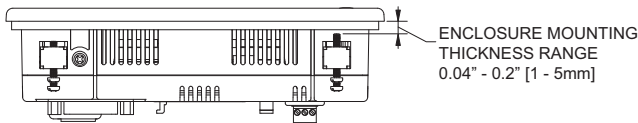
**NOTE:** The *C-more* 6" Micro-Graphic panels That (EA1-T6CL, EA1-S6ML & EA1-S6MLW), 20-Button Keypad Bezel (EA-MG6-BZ2) and 21-Button Keypad Bezel (EA-MG6-BZ2P) use the same type of mounting clip (EA-MG-BZ2-BRK).

## Panel Cutout Dimensions

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



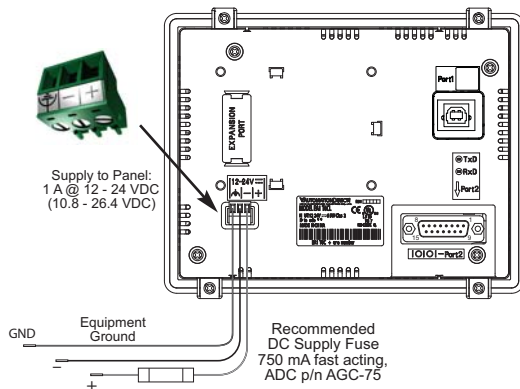
**WARNING:** To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to 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* 6" Micro-Graphic Panel

- 1.) During operation, the 6" panel is 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* 6" Micro-Graphic panel can be powered during programming from the PC through a USB Programming Cable such as USB-CBL-AB6. When powered from the PC, the panel will operate in Low-Power mode and the screen brightness is diminished.

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



#### Tightening Torque

|                              |                    |
|------------------------------|--------------------|
| Power supply wire connection | 1.7 lb-in (0.2 Nm) |
|------------------------------|--------------------|

#### Required Wire Specification

|                       |             |
|-----------------------|-------------|
| Supported temperature | Over 60 °C  |
| Wire Material         | Copper      |
| Wire Size             | 16 - 22 AWG |

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

**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness



# SYSTEM SETUP SCREENS

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## CHAPTER 5

### In This Chapter...

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# Introduction

The *C-more*® 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 brightness of the display, 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:

- Brightness value of 10
- 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 serial port, 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 loop back test section 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.

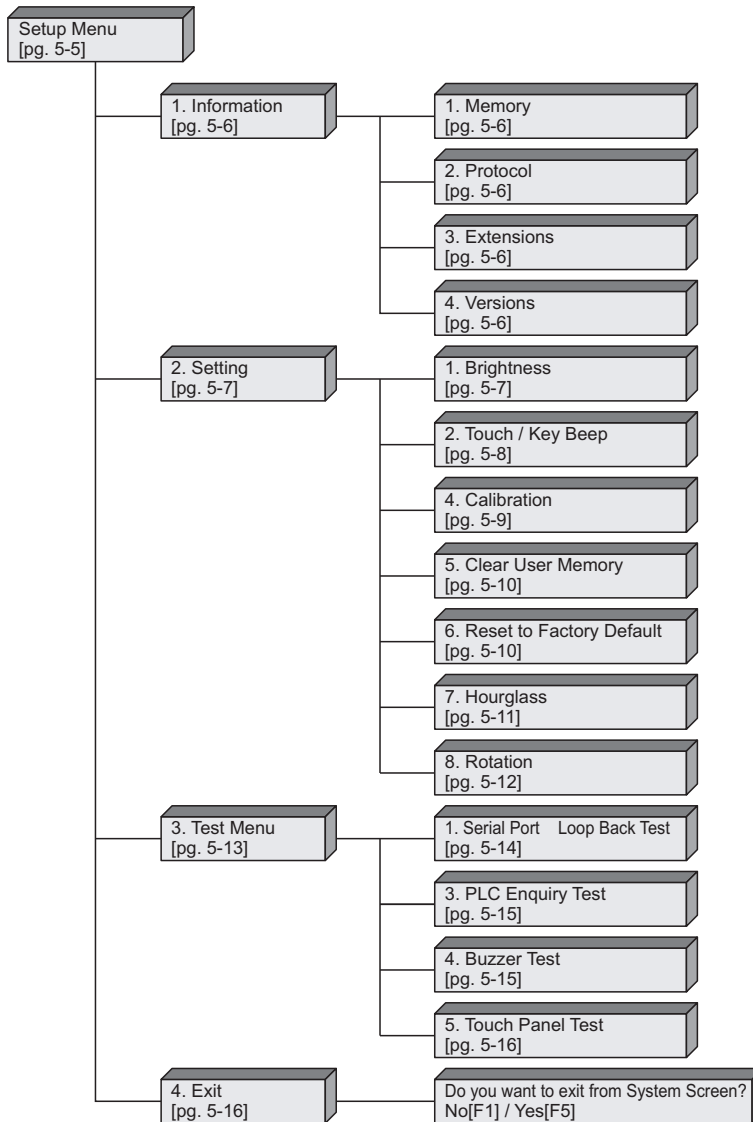
Press both the F1 and F5 function keys simultaneously for 3 seconds to bring up the System Setup Screens' Setup Menu.

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

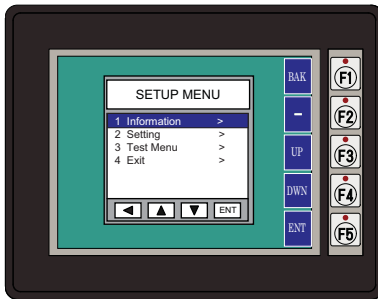
5



## System Setup Screens Flowchart

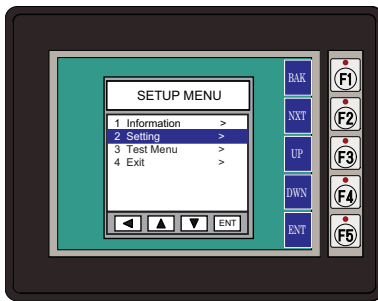


## Setup Menu

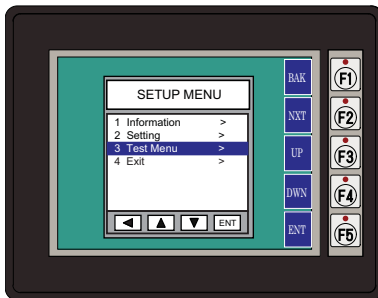


To navigate the different selections under the Setup Menu, use the function keys BAK [F1] to return to the project screen or previous screen, UP [F3] to cursor up, DWN [F4] to cursor down, and ENT [F5] to enter a selection.

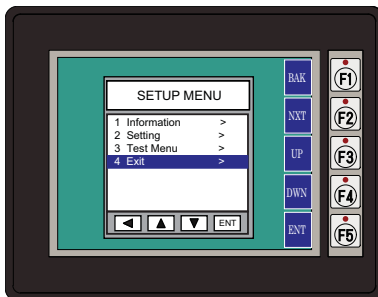
Pressing ENT [F5] with **Information** highlighted will take you to the **Information** menu screen. See page 5-6.



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

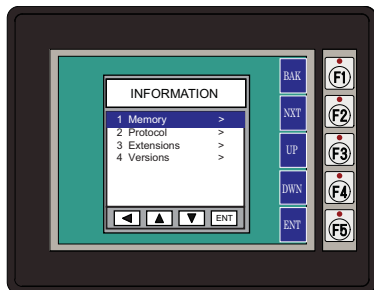


Pressing ENT [F5] with **Test Menu** highlighted will take you to the **Test Menu** screen. See page 5-15.

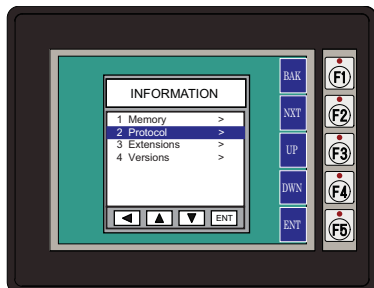
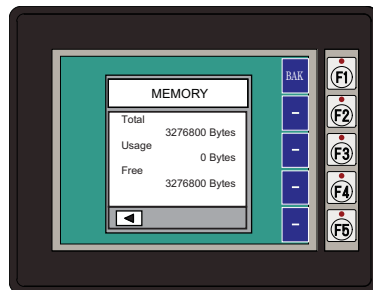


Pressing ENT [F5] with **Exit** highlighted will allow the user to decide whether to **Exit** or not **Exit** the System Setup Screens. See page 5-18.

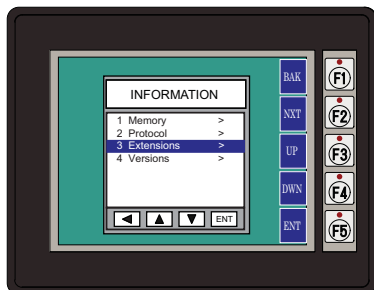
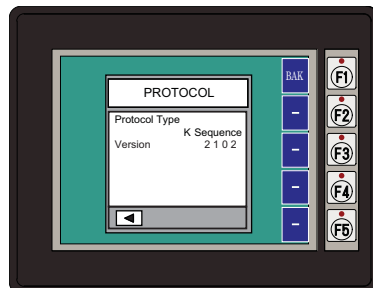
## Information Menu



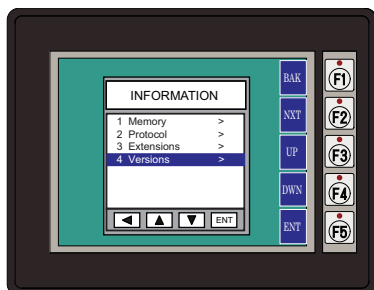
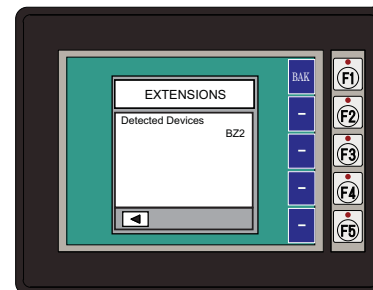
Pressing ENT [F5] with **Memory** highlighted will show the total memory available, memory usage and free memory available for the project.



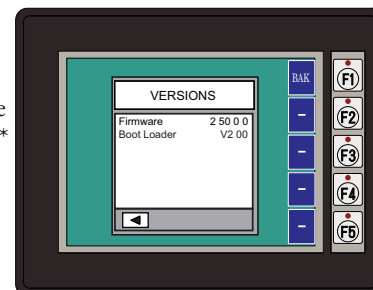
Pressing ENT [F5] with **Protocol** highlighted will show the PLC Protocol that has been assigned to the panel and the protocol version.



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.

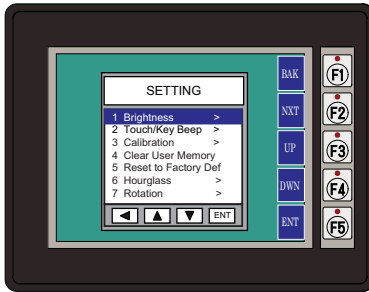


Pressing ENT [F5] with **Versions** highlighted will show the panel's firmware and boot loader versions.\*



**NOTE:** Software and Firmware Version 2.5 or later is required with models EA1-T6CL. 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. 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:

**Brightness** - page 5-7

**Touch/Key Beep** – page 5-8

**Calibration** – page 5-9

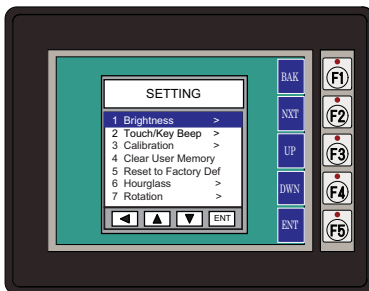
**Clear User Memory** – page 5-10

**Reset to Factory Default** – page 5-10

**Hourglass** – page 5-11

**Rotation** – page 5-12

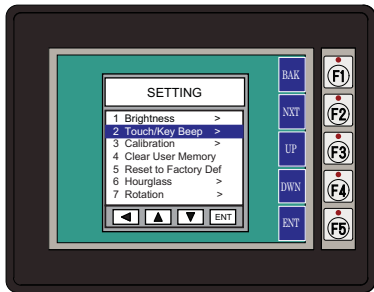
## Setting – Brightness



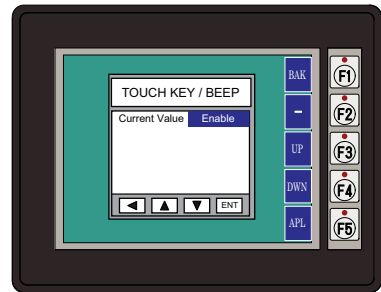
With **Brightness** highlighted, press ENT [F5] to bring up the screen showing the current value. The default is 10. The contrast can be adjusted between 1 and 16, with 1 being the least contrast and 16 being the greatest.



## Setting – Touch/Key Beep



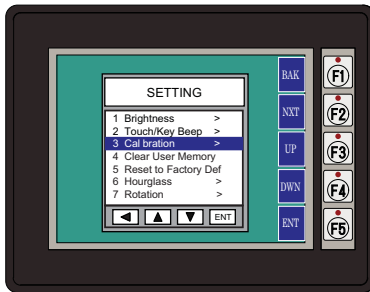
With Touch/Key Beep highlighted, press ENT [F5] to show the current value for the internal beeper. The default is ON. The UP [F3] and DWN [F4] function keys can be used to toggle between the ON and OFF state for the beeper (enable or disable). Use the APL [F5] function key to apply the selection.



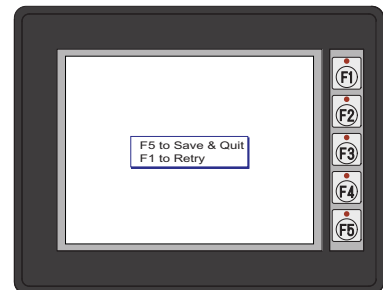
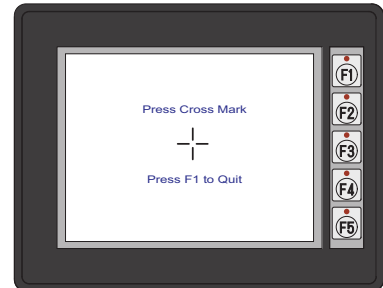
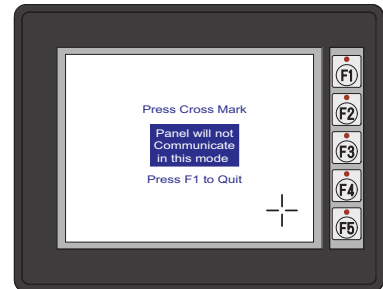
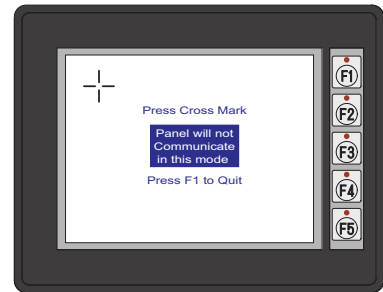
**NOTE:** Loading a project to the panel will override whatever selection is chosen for the beeper from the System Setup Screens' Beep on/off selection screen. The Beep on/off choice can be changed through the System Setup Screens **after** a project is loaded.

**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.

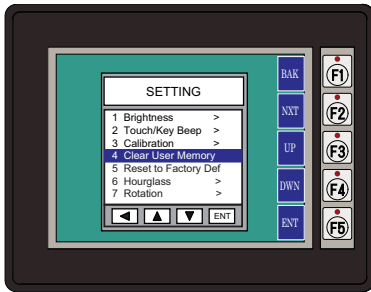
## Setting – Calibration



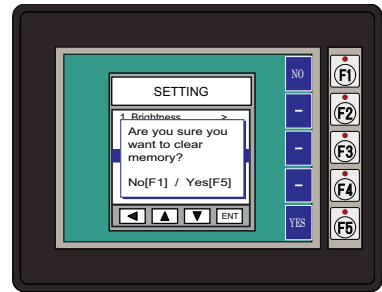
With **Calibration** highlighted, press ENT [F5] to bring up the first calibration screen as shown on the right. Touch the “cross” in the upper left corner as accurately as you can. When the screen is touched, the cross will move to each corner and finally to the center of the screen. If the touch points 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.



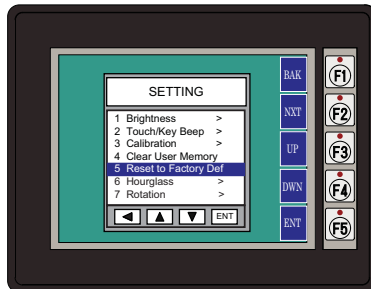
## Setting – Clear User Memory



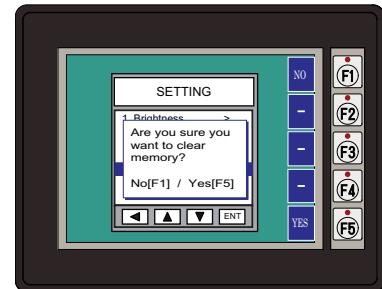
With Clear User Memory highlighted, press ENT [F5]. You will be given the choice to either proceed with clearing the user memory by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO.



## 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.



Factory default values can also be reset by pressing F2 and F4 while cycling power to the panel. The Factory Default values are:

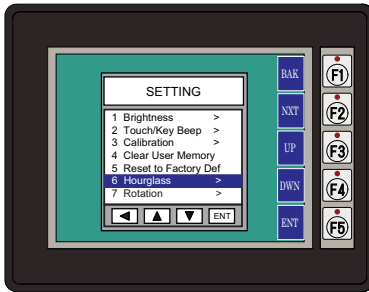
- Brightness value of 10
- The internal audible beeper enabled
- Forced touch panel calibration
- User program cleared from memory
- Hourglass icon delay of 350 ms.
- Horizontal orientation



**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.



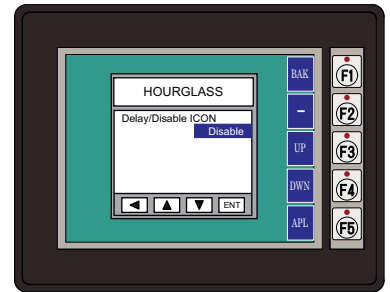
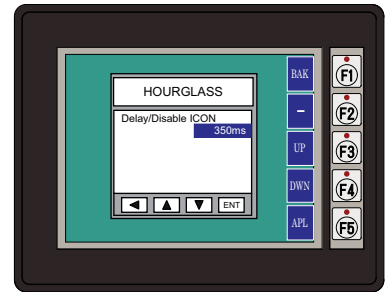
## Setting – Hourglass



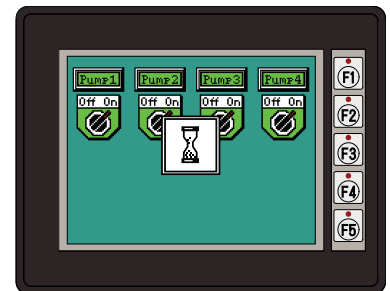
The **Hourglass** selection listed under the **Setting** menu can be used to either disable the display of the hourglass icon or set the amount of delay time (0 ms to 1000 ms) desired before it is displayed.

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.

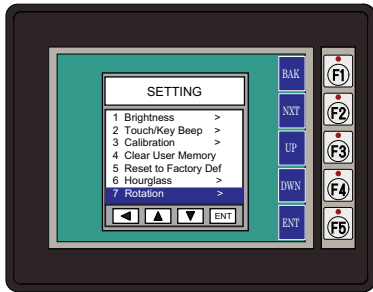
**Explanation:** An hourglass icon is displayed on the panel anytime a new screen is being loaded until communication is established with the new screen. If communication is established before the delay has timed out, no hourglass will be displayed. The hourglass icon can also be disabled from being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



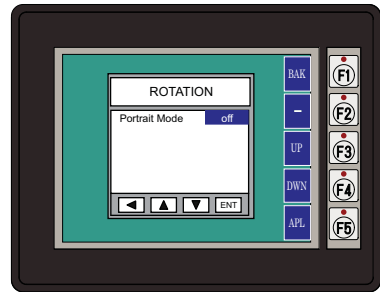
### Hourglass Icon



## Setting – Rotation

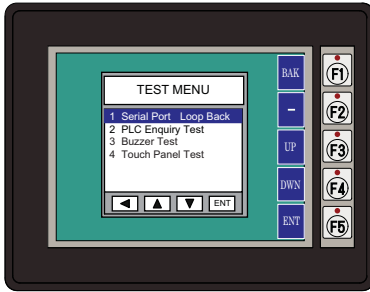


With **Rotation** highlighted, press ENT [F5] to show the current orientation. Press UP [F3] and DWN [F4] to toggle between the portrait (vertical) and landscape (horizontal) orientation. Use the APL [F5] function button to apply the selection.



**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.

Serial Port - Loop Back Test – page 5-14

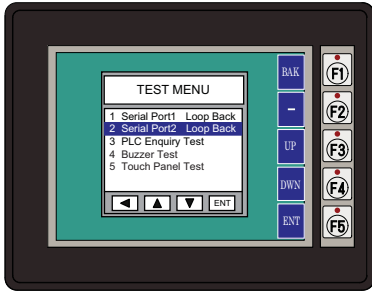
PLC Enquiry Test – page 5-15

Buzzer Test – page 5-15

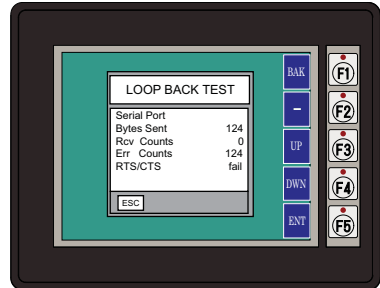
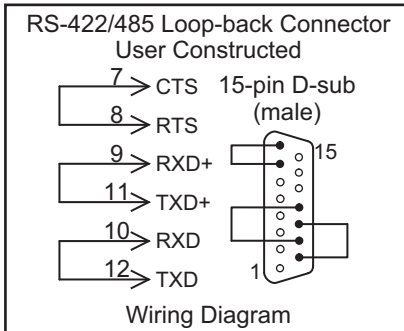
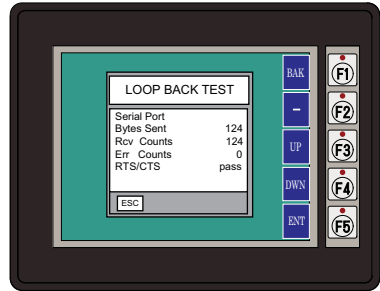
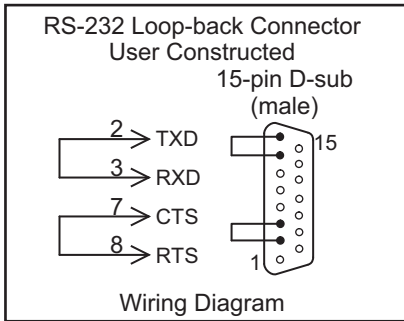
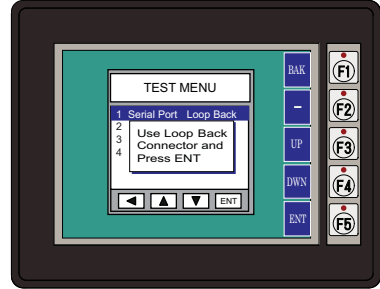
Touch Panel Test – page 5-16

# Test Menu – Serial Port - Loop Back Test

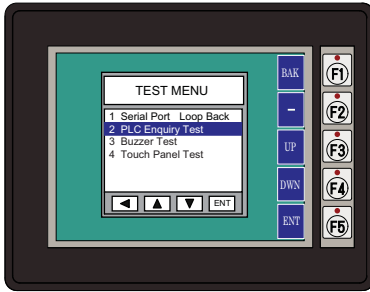
5



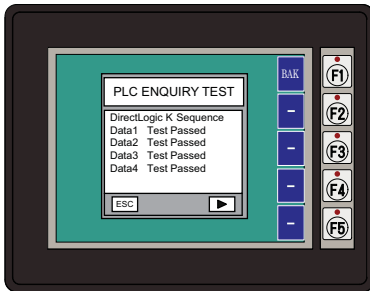
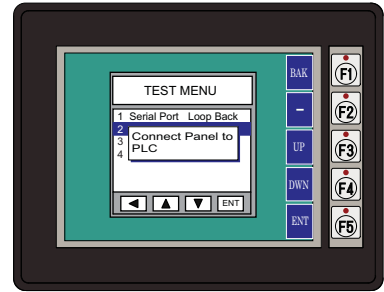
With Serial Port - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the right. At this point, either connect the RS-232 loop back connector or the RS-422/485 loop backconnector, depending on which type of communications connection is being used, and press ENT [F5] to start the 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.



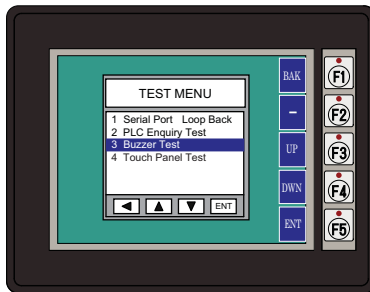
## Test Menu – PLC Enquiry Test



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.

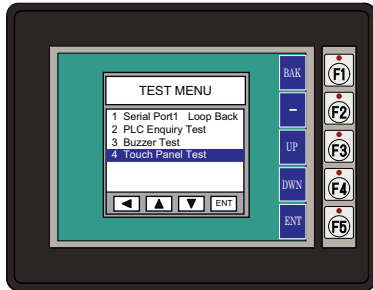


**NOTE:** The beeper tone is not selectable. The beeper function can not be turned on or off from this screen, refer to the Setting menu.

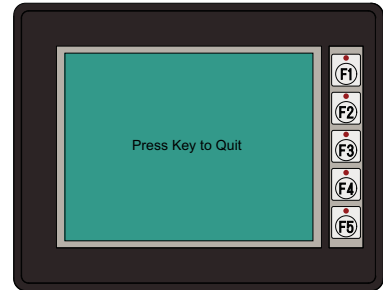


**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.

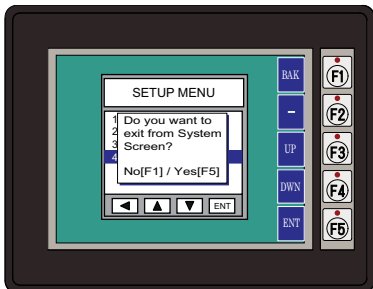
## Test Menu - Touch Panel Test



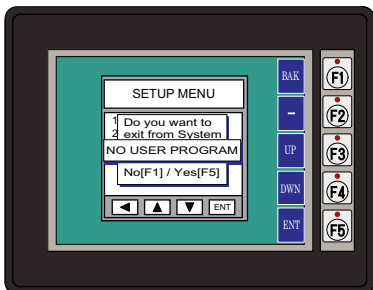
With Touch Panel Test highlighted, press ENT [F5] to bring up the screen shown to the right. Touch any area of the screen to visualize the active area of the touch screen. If the touch panel area is working properly, the screen will blacken at the area touched. Use this test to identify any area that 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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# CHAPTER 6

## In This Chapter...

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# Introduction

The *C-more*<sup>®</sup> 6" Color Micro-Graphic panels are capable of communicating with AutomationDirect CLICK and the entire *Direct*LOGIC family of PLCs. The panel is capable of communicating using RS232, RS422 or RS485 on Port2.

The *C-more*<sup>®</sup> 6" Micro-Graphic panel communicates using the following cables.

- EA-2CBL - connects to CLICK, 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 1400 & 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.



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**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.

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**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.

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## Introduction (cont'd)

### Available PLC Protocols

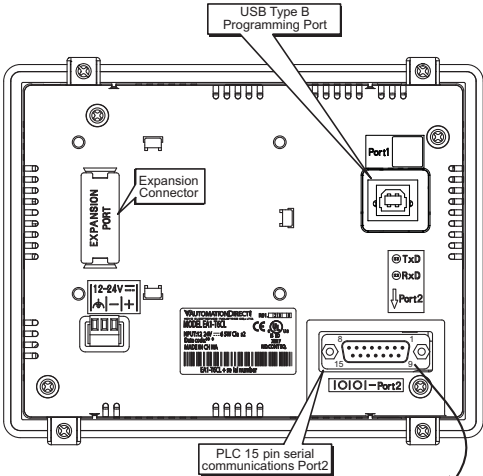
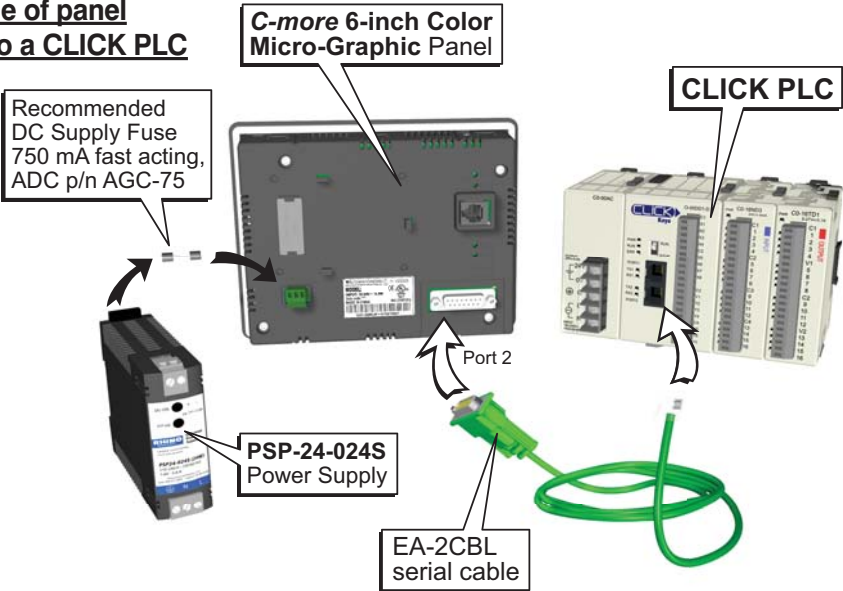
| PLC Drivers                                      |
|--|
| Serial - port2 only                              |
| AutomationDirect CLICK                           |
| AutomationDirect K-sequence                      |
| AutomationDirect DirectNET                       |
| AutomationDirect Modbus                          |
| Modicon Modbus RTU                               |
| Entivity Modbus RTU                              |
| Allen-Bradley DF1 Full Duplex                    |
| Allen-Bradley DF1 Half Duplex                    |
| Allen-Bradley PLC5 DF1                           |
| Allen-Bradley DH485                              |
| GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro) |
| Mitsubishi FX                                    |
| Mitsubishi Q, QnA                                |
| 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. 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  
connected to a CLICK PLC



| 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   | Future     | 9   | RXD+ (422/485) | 14  | do not use     |
| 5   | Logic GND  | 10  | RXD (422/485)  | 15  | do not use     |

RS-232/422/485

## 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 recommended cables and/or manufactured devices that can be used to make up the communications link between several brands of PLC's and the **C-more 6"** Micro-Graphic panel. 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.



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

The chart 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 6-26.

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)

### AutomationDirect CLICK PLC:

AutomationDirect's practically free PLC, CLICK, can be used with RS-232 3-wire networks or as a stand alone PLC.

*C-more* Micro-Graphic panels are an ideal partner for CLICK which:

- Is low cost
- Is easy to use
- Uses standard Modbus communication
- Is programmed by free CLICK programming software
- Has com ports that provide 5 VDC
- The maximum communication speed between a CLICK PLC and a *C-more* Micro-Graphic panel is 38.4 Kbps.

### **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.) Determine the cable and other components, manufactured or user constructed, are required.

### Example:

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

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

PLC Compatibility &amp; 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  |                              |
|                           |  |                              | Using panel's Port2<br>DB 15-pin - female   |                              |
|                           |  |                              | Protocol(s)<br>Supported  | Components &<br>Network Type |
| CLICK                     | all versions                             | Port 1<br>RJ12 - 6 pin       | AutomationDirect<br>Modbus (CLICK)  | EA-2CBL<br>RS-232            |
| DirectLOGIC<br>DL05       | all versions                             | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><i>Direct</i> NET,<br>Modbus RTU                                     | EA-2CBL<br>RS-232            |
|                           |  | Port 2<br>RJ12 - 6 pin       |   |                              |
|                           | D0-DCM                                   | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><i>Direct</i> NET,<br>Modbus RTU                                     | EA-2CBL<br>RS-232            |
|                           |  | Port 2<br>DB15HD<br>(female) |   | EA-2CBL-1<br>RS-232          |
|                           |  |                              |   | * See Diagram 1<br>RS-422    |
|                           |  | Modbus RTU                   | * See Diagram 2<br>RS-485<br>Modbus only  |                              |
| DirectLOGIC<br>DL06       | all versions                             | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><i>Direct</i> NET,<br>Modbus RTU                                     | EA-2CBL<br>RS-232            |
|                           |  | Port 2<br>DB15HD<br>(female) |   | EA-2CBL-1<br>RS-232          |
|                           |  |                              |   | * See Diagram 1<br>RS-422    |
|                           |  | Modbus RTU                   | * See Diagram 2<br>RS-485<br>Modbus only  |                              |
|                           | D0-DCM                                   | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><i>Direct</i> NET,<br>Modbus RTU                                     | EA-2CBL<br>RS-232            |
|                           |  | Port 2<br>DB15HD<br>(female) |   | EA-2CBL-1<br>RS-232          |
| * See Diagram 1<br>RS-422 |  |                              |   |                              |
| Modbus RTU                | * See Diagram 2<br>RS-485<br>Modbus only |                              |   |                              |
| DirectLOGIC<br>DL105      | all versions                             | Port 1<br>RJ12 - 6 pin       | K-sequence  | EA-2CBL<br>RS-232            |

\* Note: Wiring Diagrams for user constructed cables start on page 6-24.

## 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. |                              |
|   |          |                                 | External DC Power Supply  |                              |
|   |          |                                 | Using panel's Port2<br>DB 15-pin - female   |                              |
|   |          |                                 | Protocol(s)<br>Supported  | Components &<br>Network Type |
| DirectLOGIC<br>DL205  | D2-230   | Port 1<br>RJ12 - 6 pin          | K-sequence  | EA-2CBL<br>RS-232            |
|   | D2-240   | Port 1<br>RJ12 - 6 pin          | K-sequence  | EA-2CBL<br>RS-232            |
|   |          | Port 2<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET  |                              |
|   | D2-250-1 | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-2CBL<br>RS-232            |
|   |          | Port 2<br>DB15HD<br>(female)    |   | EA-2CBL-1<br>RS-232          |
|   |          |                                 |   | * See Diagram 1<br>RS-422    |
|   | D2-260   | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-2CBL<br>RS-232            |
|   |          | Port 2<br>DB15HD<br>(female)    |   | EA-2CBL-1<br>RS-232          |
|   |          |                                 |   | * See Diagram 1<br>RS-422    |
|   |          |                                 |   | Modbus RTU                   |
|   | D2-DCM   | Port 1<br>DB 25 pin<br>(female) | DirectNET   | EA-4CBL-2<br>RS-232          |
|   |          |                                 |   | * See Diagram 5<br>RS-422    |
|   | WINPLC   | Port 1<br>RJ12 - 6 pin          | Modbus RTU  | EA-2CBL<br>RS-232            |
| * Note: Wiring Diagrams for user constructed cables start on page 6-24. |          |                                 |   |                              |

**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. |                                  |
|                              |                       |                                     | External DC Power Supply  |                                  |
|                              |                       |                                     | Using panel's Port2<br>DB 15-pin - female   |                                  |
|                              |                       |                                     | Protocol(s) Supported   | Components & Network Type        |
| <b>DirectLOGIC<br/>DL305</b> | D3-330 or<br>D3-340   | D3-232-DCU<br>DB 25 pin<br>(female) | <b>DirectNET</b>  | <b>EA-4CBL-2</b><br>RS-232       |
|                              |                       | D3-422-DCU<br>DB 25 pin<br>(female) | <b>DirectNET</b>  | <b>* See Diagram 5</b><br>RS-422 |
|                              | D3-340                | Port 1<br>RJ11 - 4 pin              | <b>DirectNET</b>  | <b>EA-3CBL</b><br>RS-232         |
|                              |                       | Port 2<br>RJ11 - 4 pin              | <b>DirectNET,</b><br>Modbus RTU   |                                  |
|                              | D3-350                | Port 1<br>RJ12 - 6 pin              | K-sequence,<br><b>DirectNET</b>   | <b>EA-2CBL</b><br>RS-232         |
|                              |                       | Port 2<br>DB 25 pin<br>(female)     | K-sequence,<br><b>DirectNET,</b><br>Modbus RTU                                      | <b>EA-4CBL-2</b><br>RS-232       |
|                              | D3-DCM<br>D3-350 only | Port 1<br>DB 25 pin<br>(female)     | <b>DirectNET</b>  | <b>* See Diagram 3</b><br>RS-422 |
|                              |                       |                                     |   | <b>EA-4CBL-2</b><br>RS-232       |
|                              | D3-DCM<br>D3-350 only | Port 1<br>DB 25 pin<br>(female)     | <b>DirectNET</b>  | <b>* See Diagram 5</b><br>RS-422 |
|                              |                       |                                     |   | <b>* See Diagram 5</b><br>RS-422 |

\* Note: Wiring Diagrams for user constructed cables start on page 6-24.



**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. |  |
|   |        |                                 | External DC Power Supply  |  |
|   |        |                                 | Using panel's Port2<br>DB 15-pin - female   |  |
|   |        |                                 | Protocol(s)<br>Supported  | Components &<br>Network Type                     |
| DirectLOGIC<br>DL405  | D4-430 | Port 0<br>DB 15 pin<br>(female) | K-sequence  | EA-4CBL-1<br>RS-232                              |
|   |        | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET  | EA-4CBL-2<br>RS-232<br>* See Diagram 3<br>RS-422 |
|   | D4-440 | Port 0<br>DB 15 pin<br>(female) | K-sequence  | EA-4CBL-1<br>RS-232                              |
|   |        | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET  | EA-4CBL-2<br>RS-232<br>* See Diagram 3<br>RS-422 |
|   | D4-450 | Port 0<br>DB 15 pin<br>(female) | K-sequence  | EA-4CBL-1<br>RS-232                              |
|   |        | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-4CBL-2<br>RS-232<br>* See Diagram 3<br>RS-422 |
|   |        | Port 3<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET,<br>Modbus RTU   | * See Diagram 4<br>RS-422                        |
|   |        | Port 2<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET  | EA-2CBL<br>RS-232                                |
|   | D4-DCM | Port 1<br>DB 25 pin<br>(female) | DirectNET   | EA-4CBL-2<br>RS-232<br>* See Diagram 5<br>RS-422 |
|   |        |                                 |   |  |
| * Note: Wiring Diagrams for user constructed cables start on page 6-24. |        |                                 |   |  |

## Allen-Bradley PLCs

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

PLC Compatibility &amp; 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 Port2<br>DB 15-pin - female   |                           |
|                            |                              |                       | Protocol(s) Supported   | Components & Network Type |
| Allen-Bradley MicroLogix   | 1000, 1100, 1200, 1400, 1500 | 8-pin mini-din port   | 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 Port2<br>DB 15-pin - female   |                                  |
|                                      |  |                          | Protocol(s) Supported   | Components & Network Type        |
| GE                                   | 90/30, 90/70   | 15-pin D-sub port        | SNPX  | EA-90-30-CBL RS-422              |
|                                      | Micro 90, VersaMax Micro                                   | RJ45 Port 1              |   | * See Diagram 13 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            |
|                                      | Q / QnA  | 9-pin D-sub port         | Q / QnA   | * See Diagram 15 RS-232C         |
|                                      |  | 6-pin mini-din port      |   | * See Diagram 16 RS-232C         |
| 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 8 & 9 RS-232       |
| Modicon                              | 984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU | varies                   | Modbus RTU  | * See Diagram 10, 11 & 12 RS-232 |
| Siemens                              | S7-200 CPU   | 9-pin D-sub port 0 or 1  | PPI   | * See Diagram 14 RS-485          |

\* Note: Wiring Diagrams for user constructed cables start on page 6-24.

\* Note: Wiring Diagrams for user constructed cables start on page 6-24.

## Cables from *AutomationDirect*

| Cable Description  | Cable Part No.  |
|--|-----------------|
| AutomationDirect CLICK, <i>Direct</i> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C) | EA-2CBL         |
| <i>Direct</i> LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).                                       | EA-2CBL-1       |
| <i>Direct</i> LOGIC PLC RJ-11 port, D3-340 (RS-232C).  | EA-3CBL         |
| <i>Direct</i> LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).  | EA-4CBL-1       |
| <i>Direct</i> LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C).                               | EA-4CBL-2       |
| 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 |
| Allen-Bradley MicroLogix, SLC 5-01/02/03, PLC5 DH485 port (RS-232C)  | EA-DH485-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    |

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



Part No. EA-2CBL



Part No. EA-2CBL-1



Part No. EA-3CBL



Part No. EA-4CBL-1



Part No. EA-4CBL-2



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



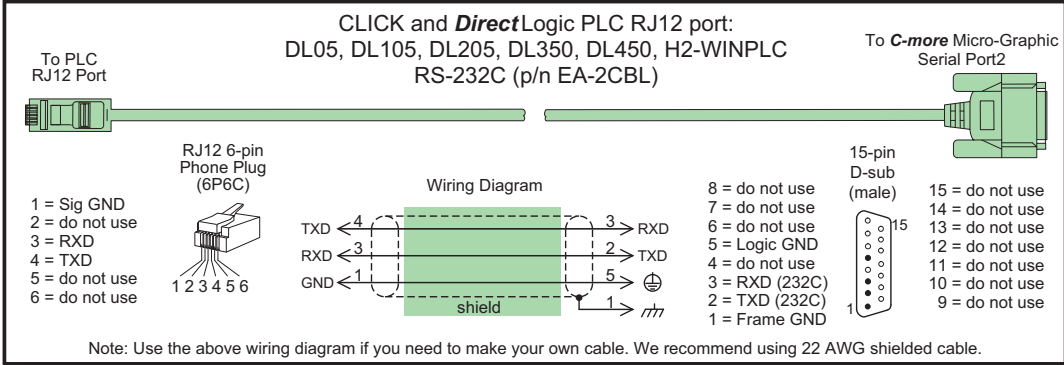
Part No. EA-OMRON-CBL

# 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.

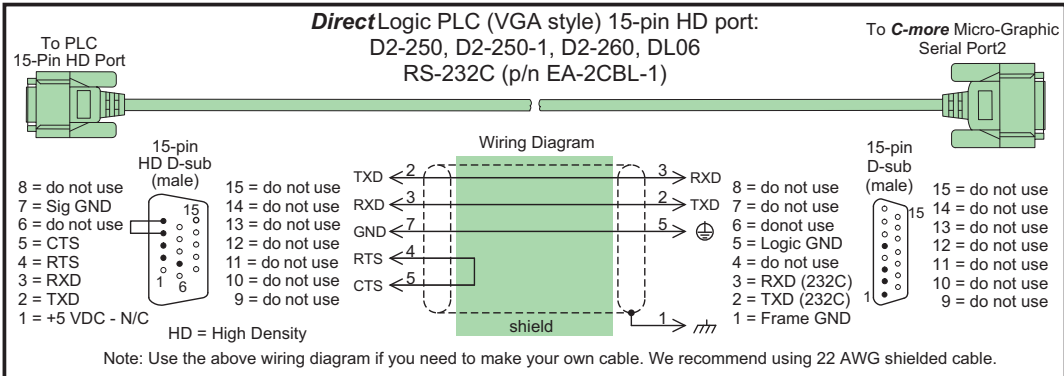
## CLICK & DirectLOGIC:

## EA-2CBL



## DirectLOGIC:

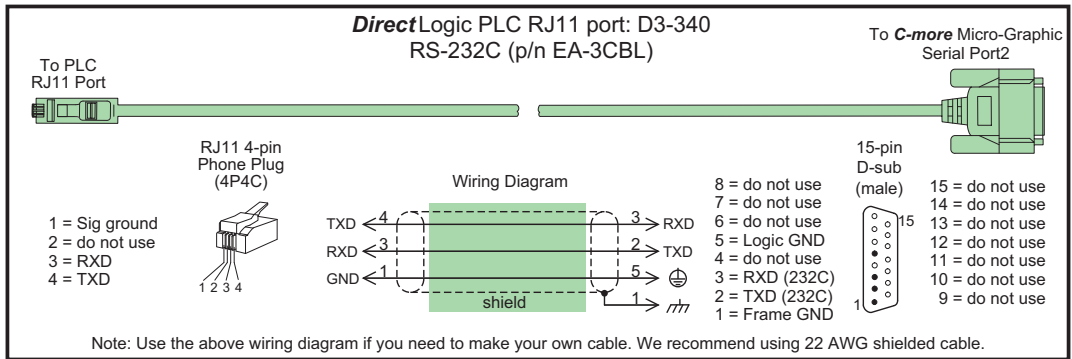
## EA-2CBL-1



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

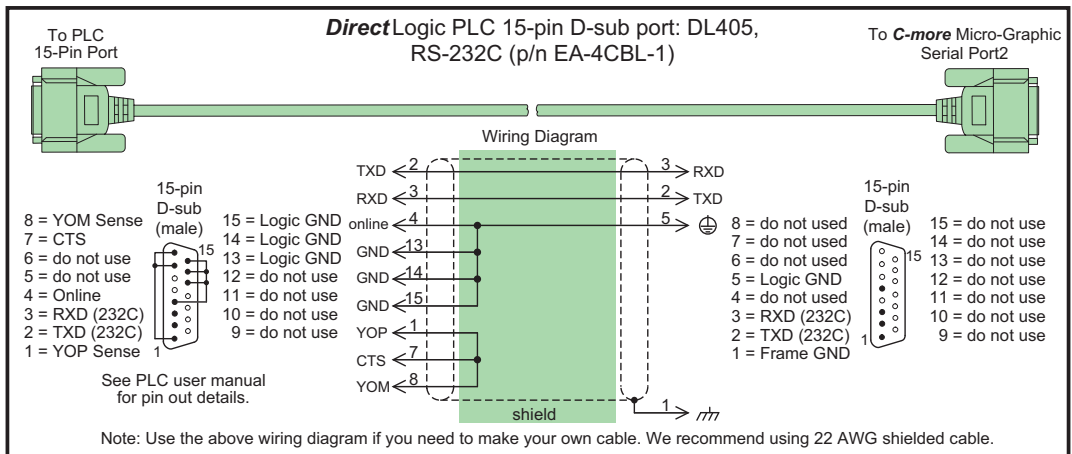
## DirectLOGIC:

## EA-3CBL



6

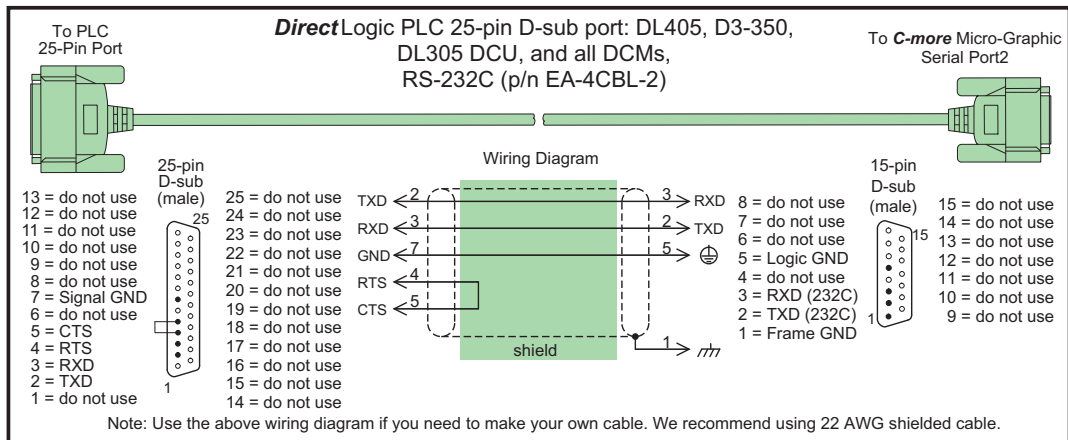
## EA-4CBL-1



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

**Direct**LOGIC:

**EA-4CBL-2**





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

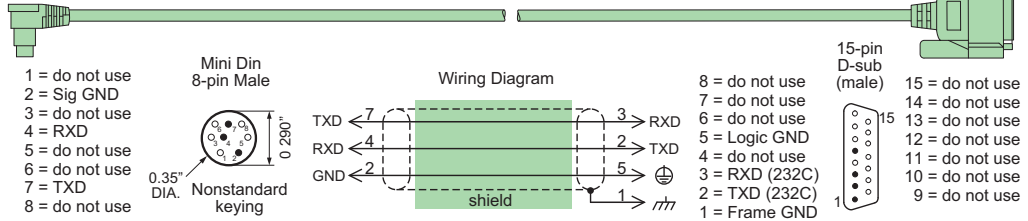
## Allen-Bradley:

## EA-MLOGIX-CBL

To AB MicroLogix RS-232 communication channel

Allen-Bradley MicroLogix™ 1000/1100/1200/1400/1500  
RS-232C (p/n EA-MLOGIX-CBL)

To C-more Micro-Graphic Serial Port2



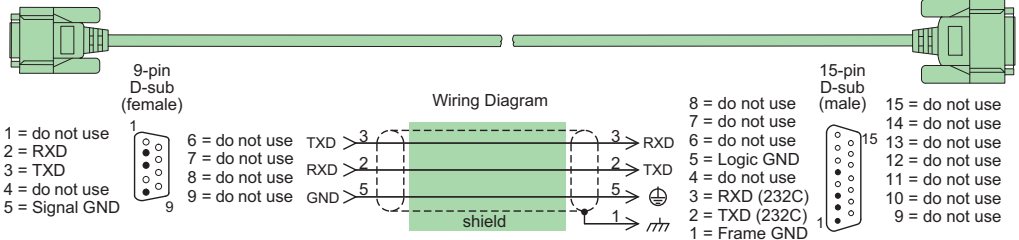
6

## 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

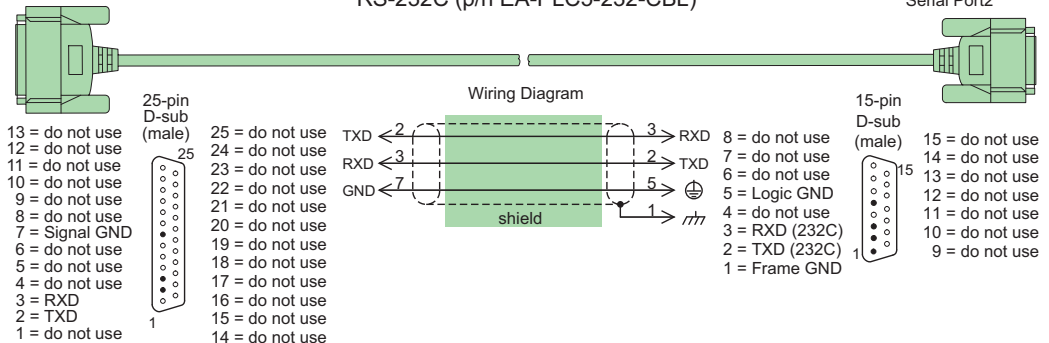


## EA-PLC5-232-CBL

To PLC 25-Pin Port

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

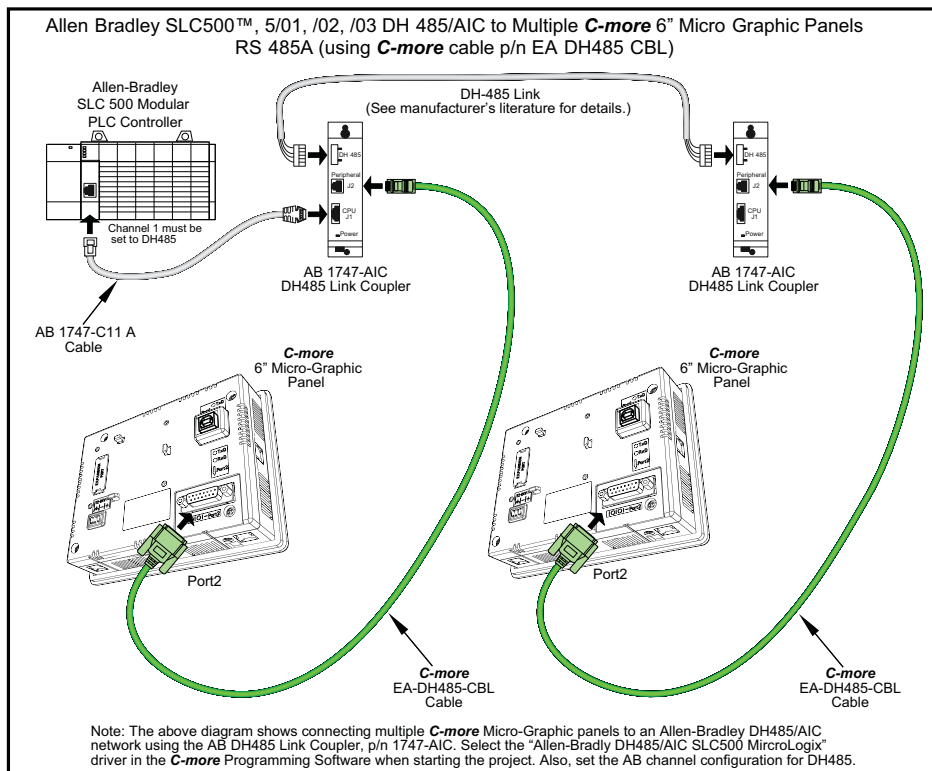
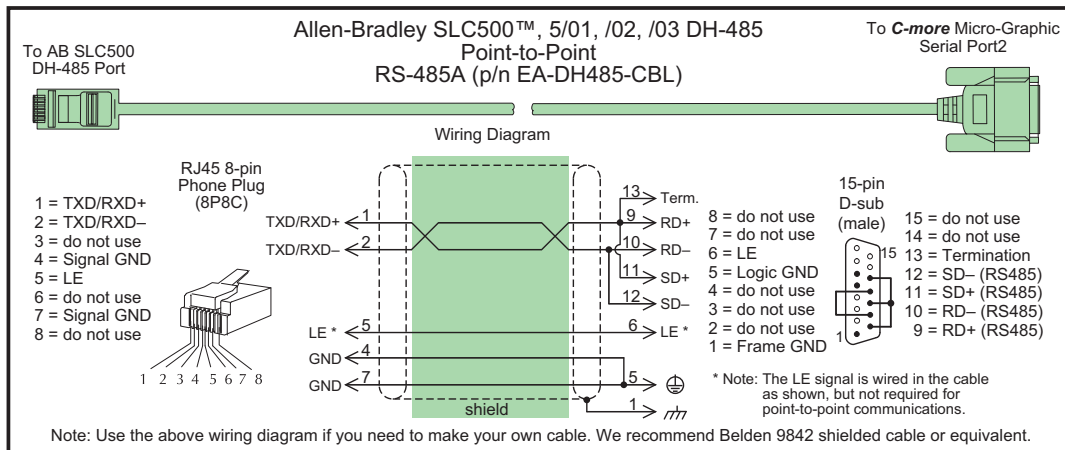
To C-more Micro-Graphic Serial Port2



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

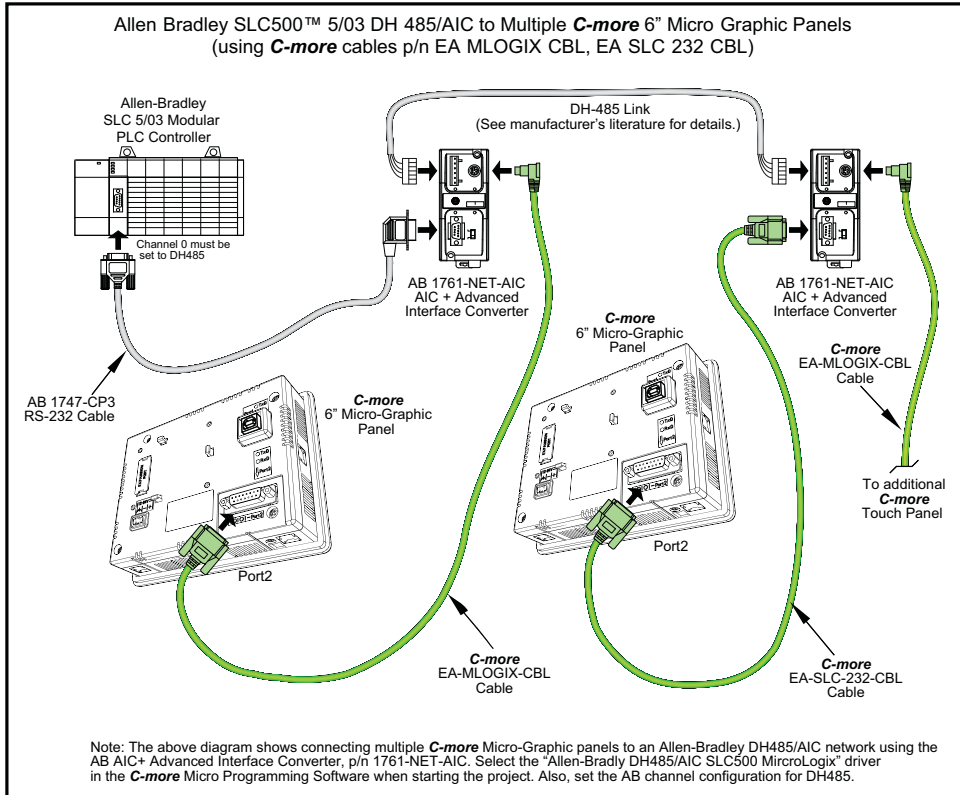
Allen-Bradley:

EA-DH485-CBL



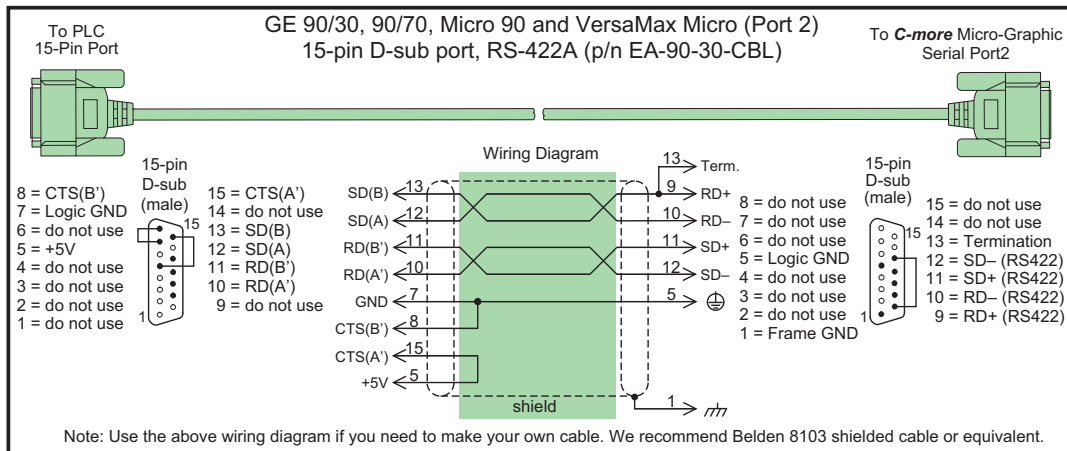
## Cables from AutomationDirect - Wiring Diagrams (cont'd)

### Allen-Bradley:

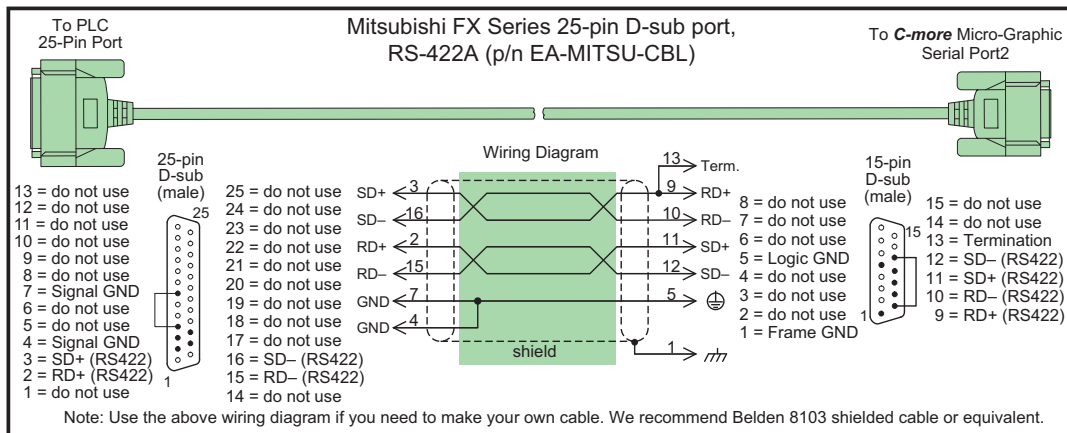


## Cables from AutomationDirect - Wiring Diagrams (cont'd)

GE:

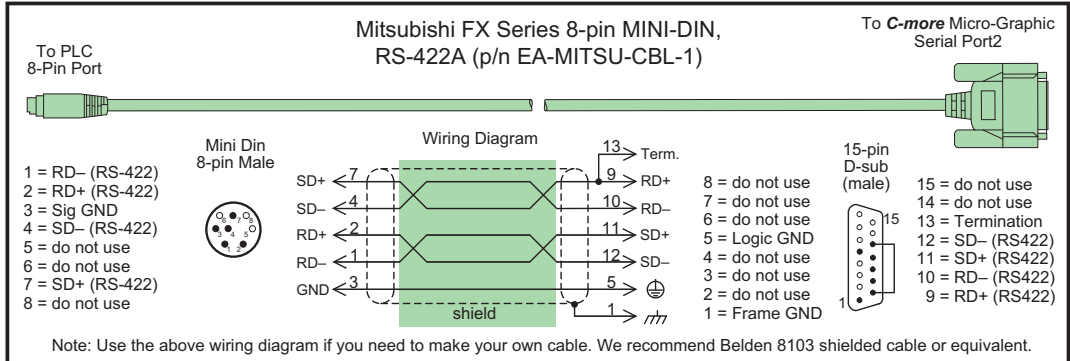
**EA-90-30-CBL**

Mitsubishi:

**EA-MITSU-CBL**

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

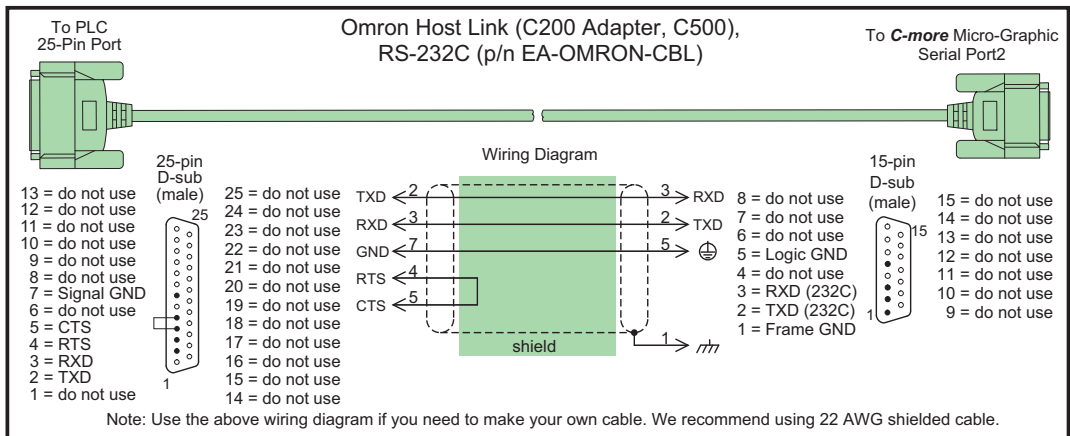
## Mitsubishi: EA-MITSU-CBL-1



6

Omron:

EA-OMRON-CBL



# User Constructed Cables – Wiring Diagrams

Diagram 1

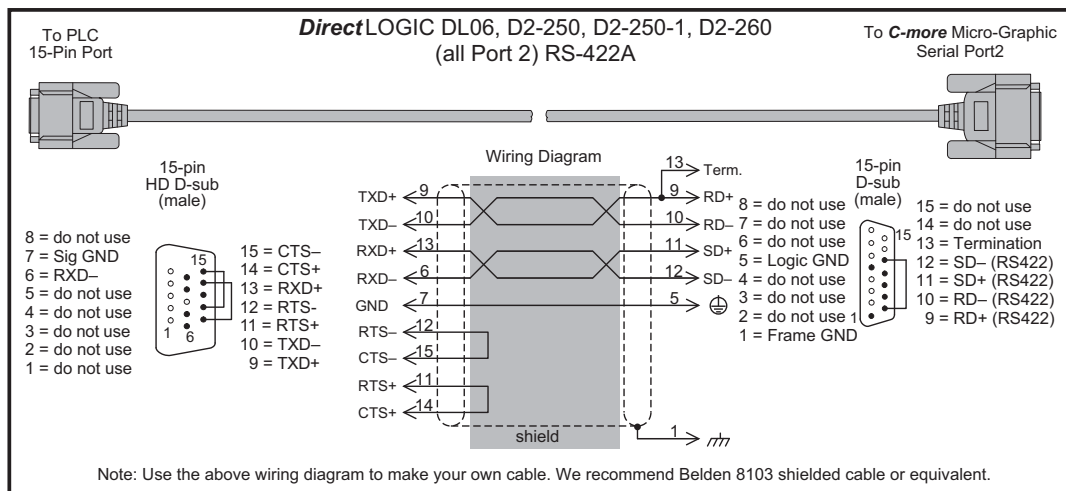
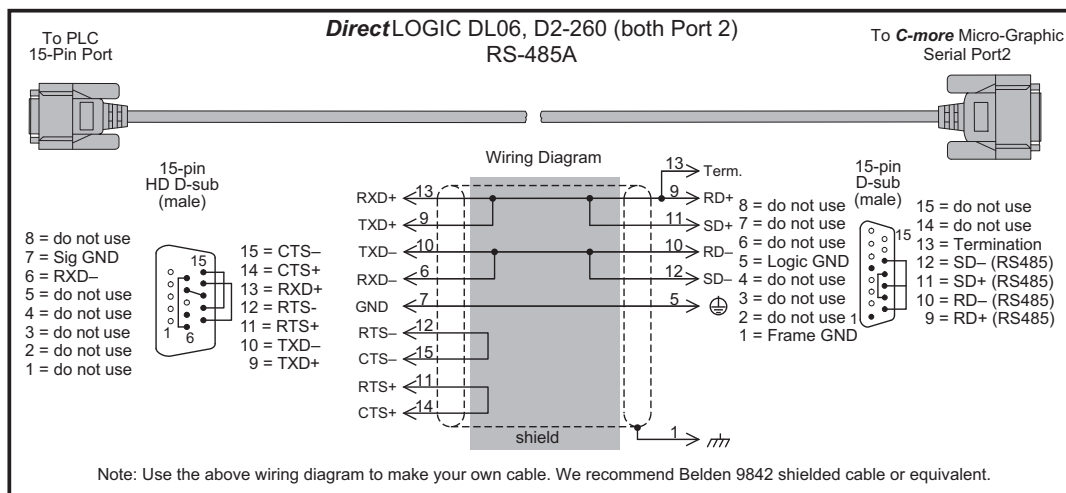
**User Constructed**

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 6-32 if more than one PLC will be connected to a panel.

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

Diagram 3

User Constructed

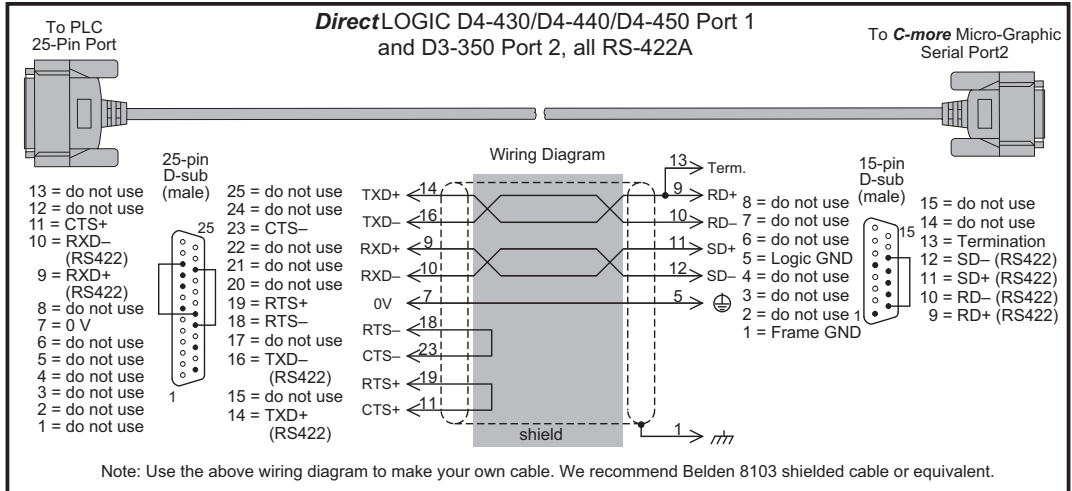
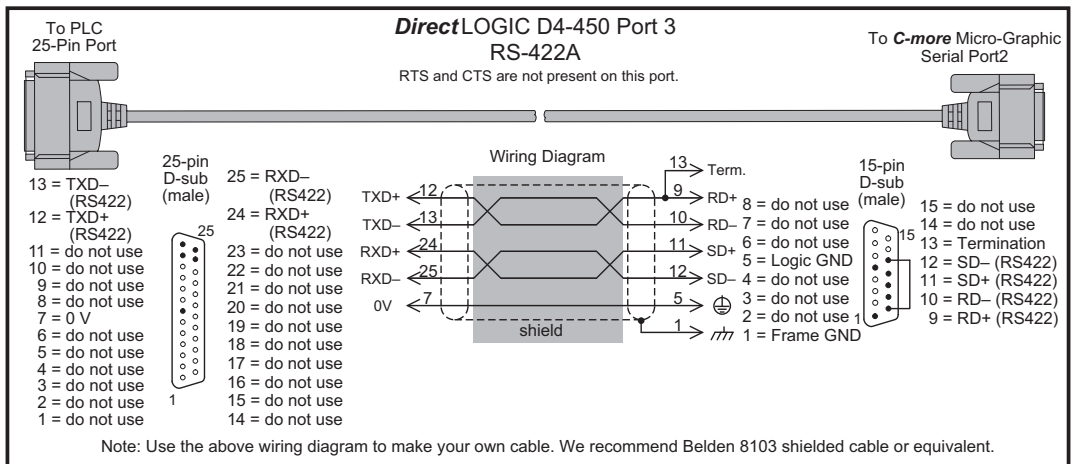


Diagram 4

User Constructed

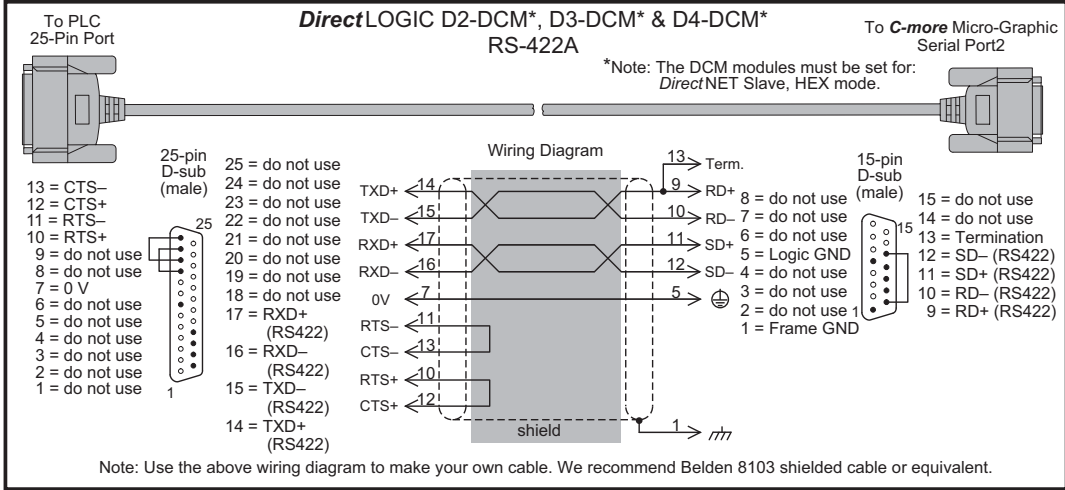


**NOTE:** The RS-422 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-32 if more than one PLC will be connected to a panel.

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

Diagram 5

**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 6-30 if more than one PLC will be connected to a panel.



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

Diagram 6

User Constructed

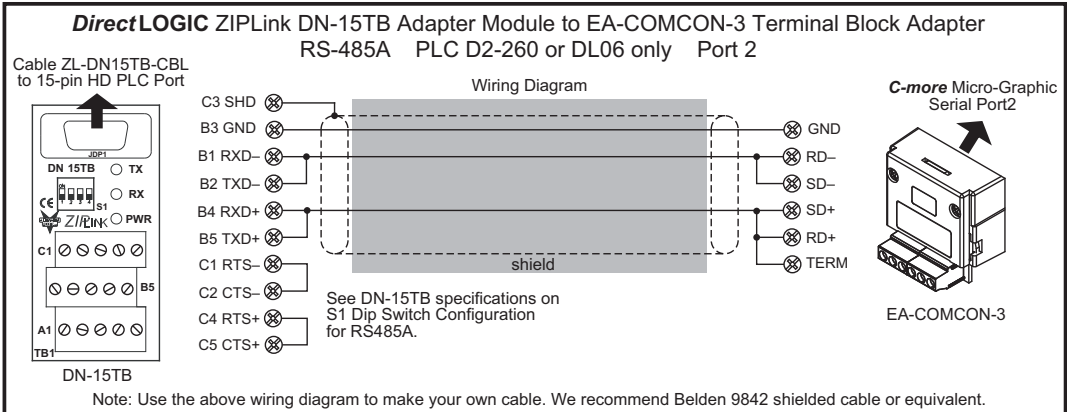
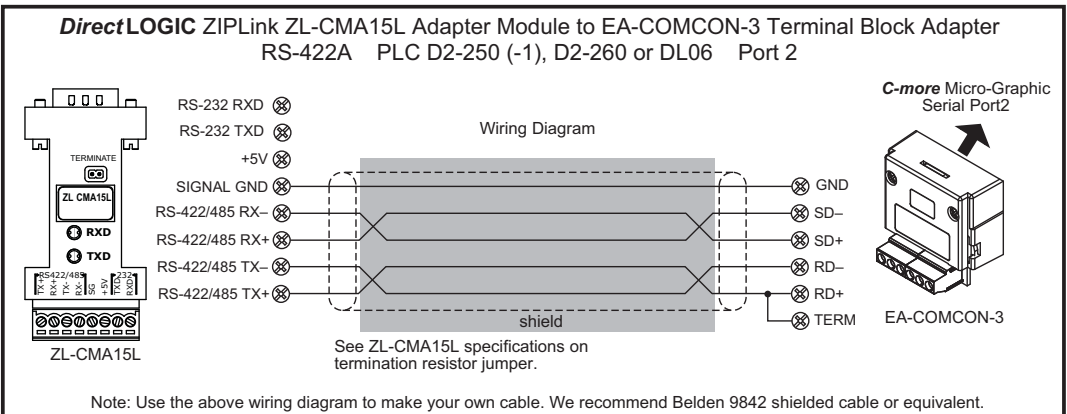


Diagram 7



**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 6-30 if more than one PLC will be connected to a panel.

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

Diagram 8

**User Constructed**

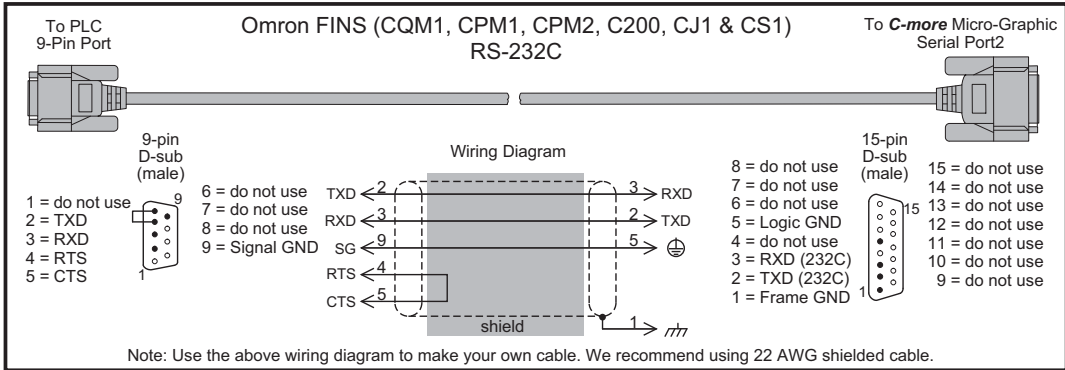


Diagram 9

**User Constructed**

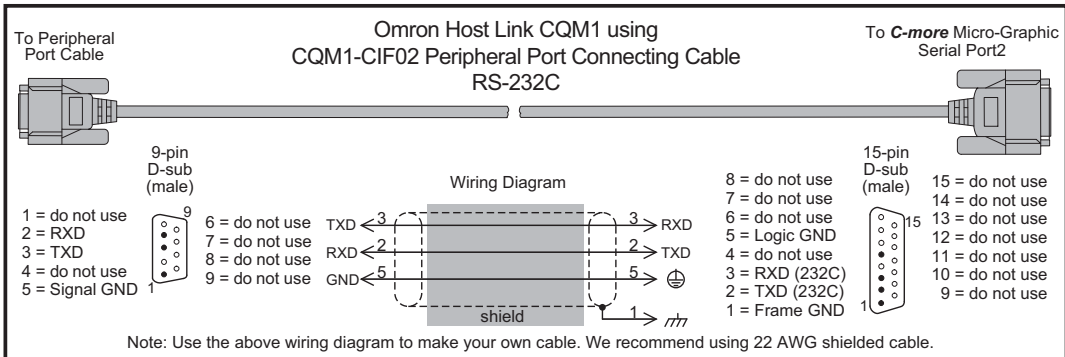
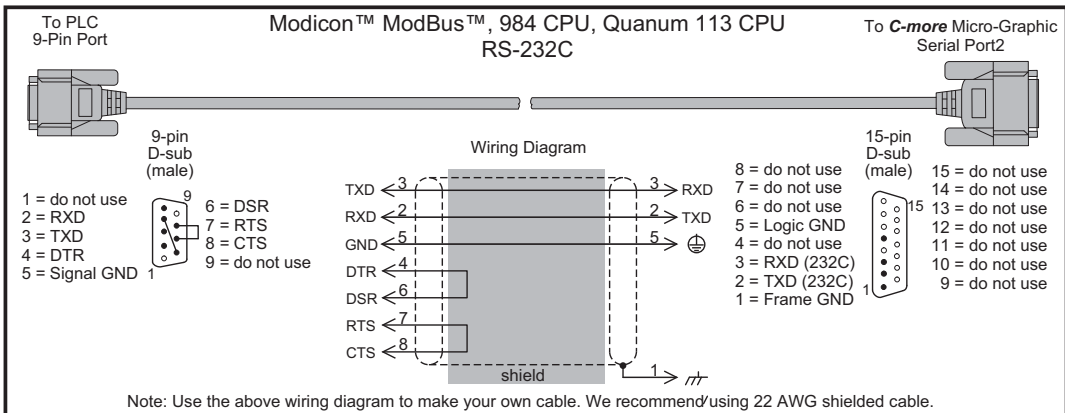


Diagram 10

**User Constructed**



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

Diagram 11

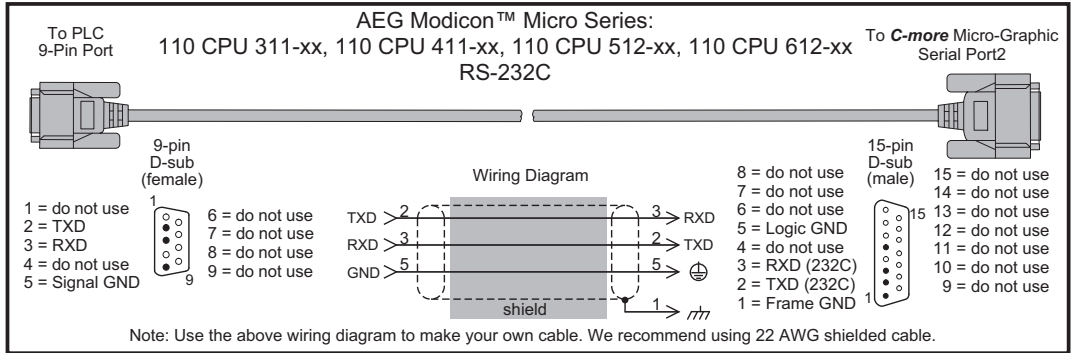
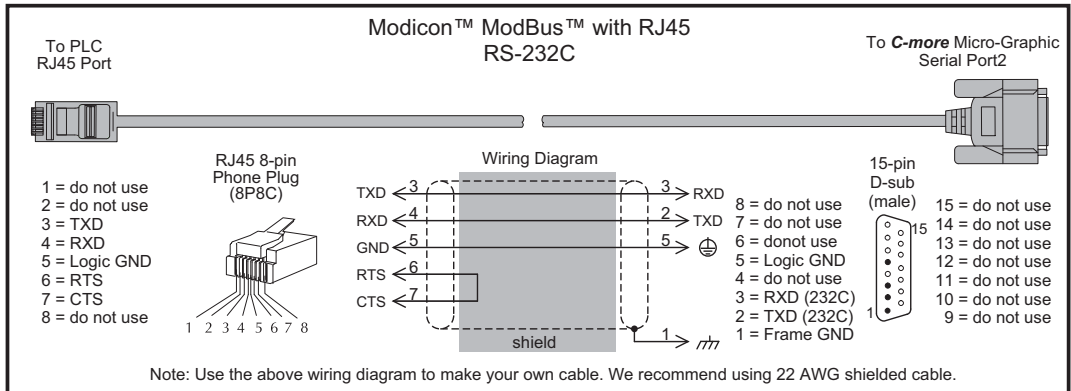
**User Constructed**

Diagram 12

**User Constructed**

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

Diagram 13

**User Constructed**

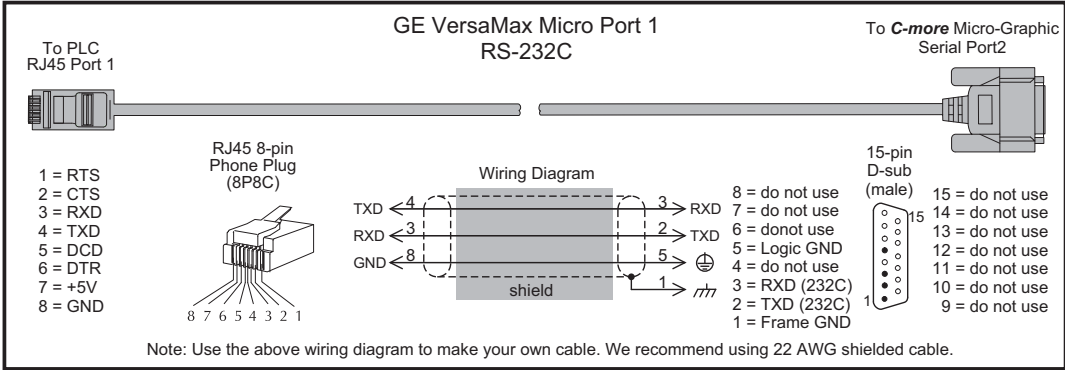
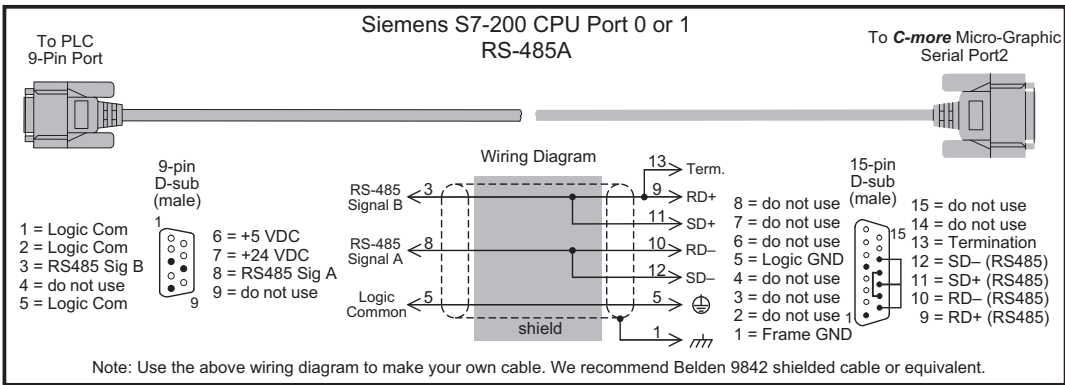


Diagram 14

**User Constructed**



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

Diagram 15

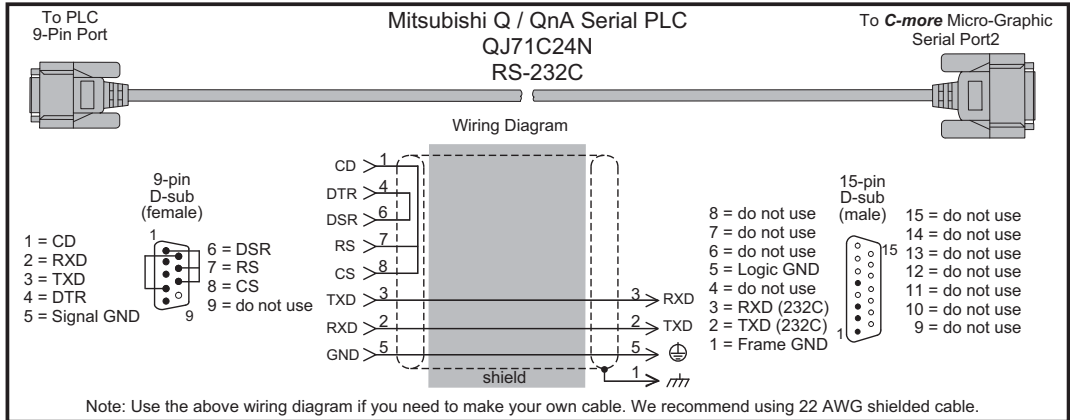
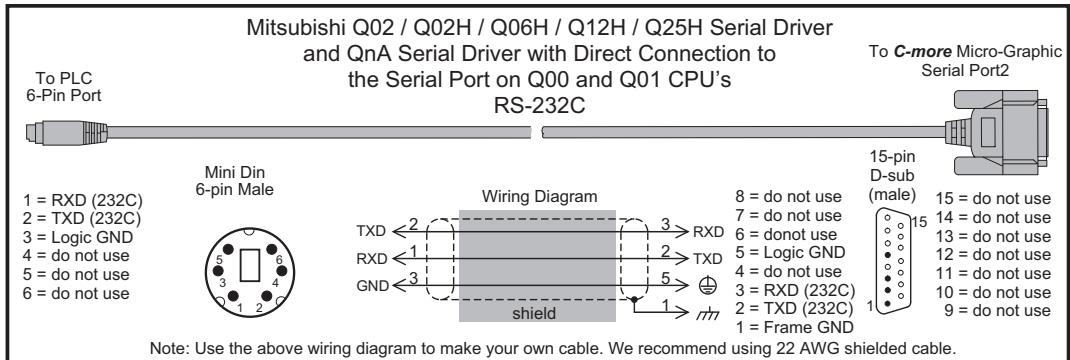
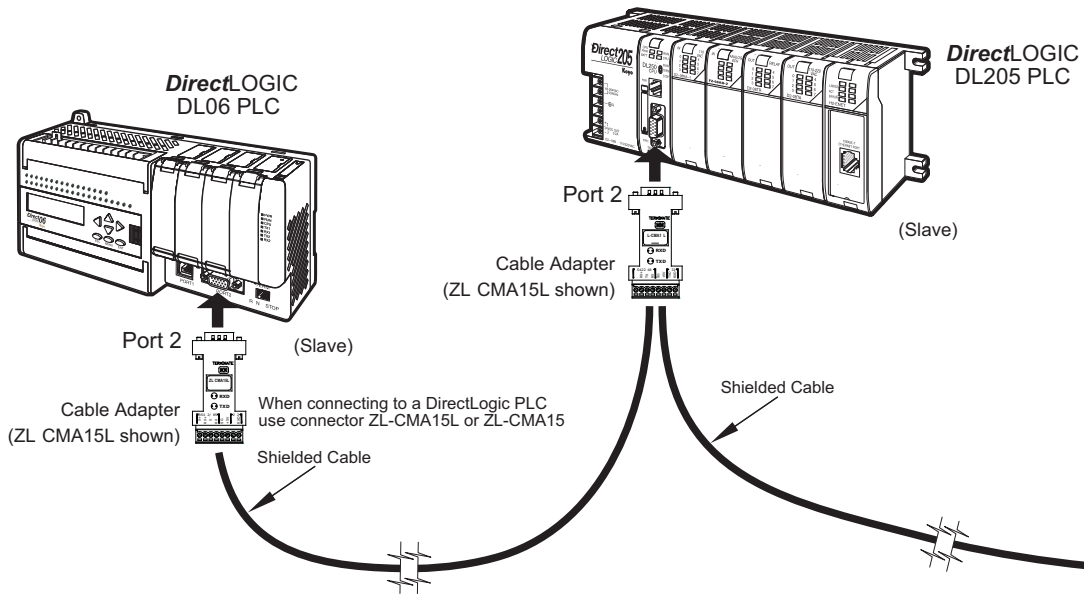
**User Constructed**

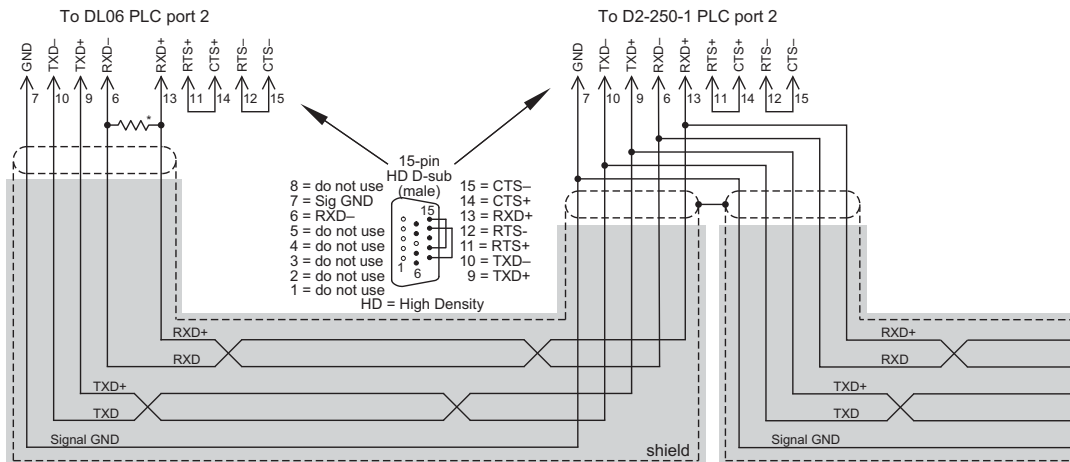
Diagram 16

**User Constructed**

# RS-422A Multi-Drop Wiring Diagram Example



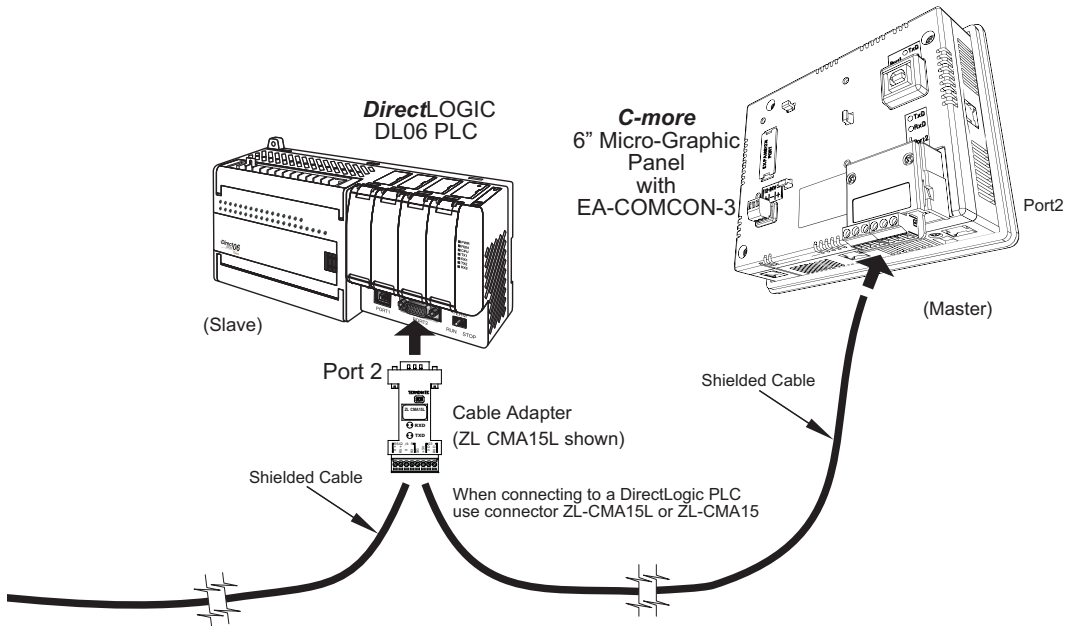
- Notes: 1. We recommend Belden 8103 shielded cable or equivalent.  
2. Wiring Diagram for this example, ZL-CMA15(L), on page 6-27



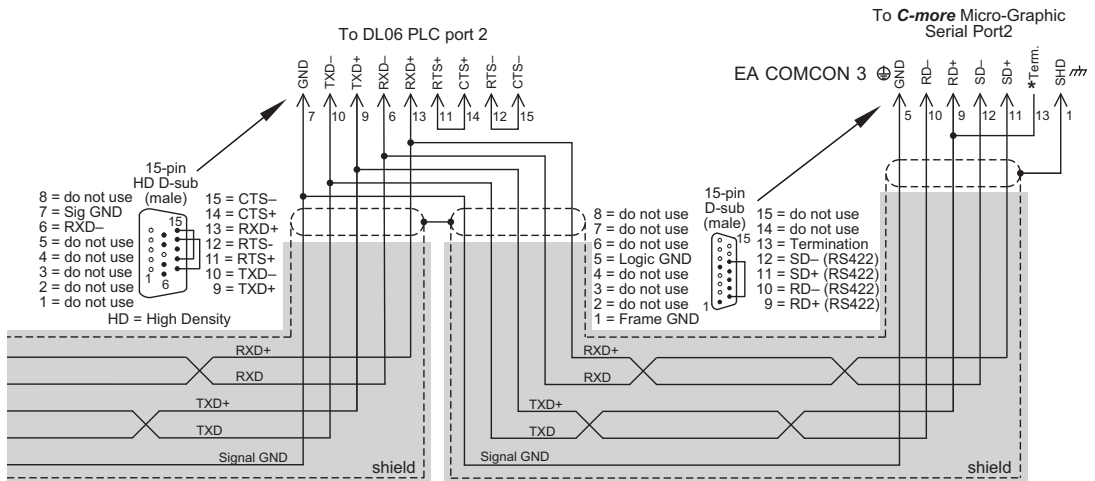
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-422 Multi-Drop Wiring Diagram

## RS-422A Multi-Drop Wiring Diagram Example (cont'd)



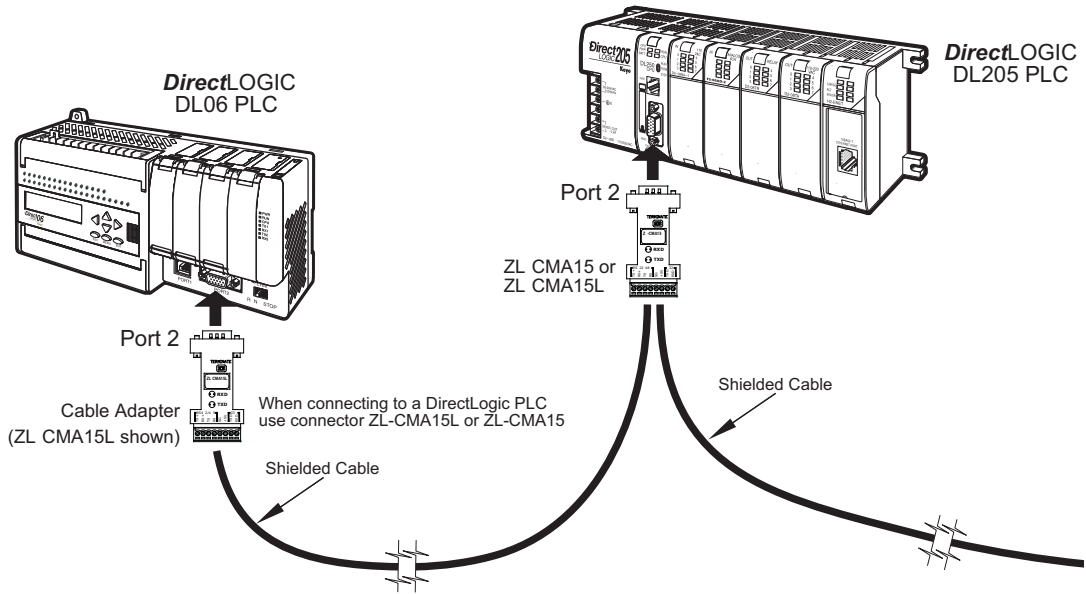
Notes: 1. We recommend Belden 8103 shielded cable or equivalent.  
2. Wiring Diagram for this example, ZL-CMA15(L), on page 6-27



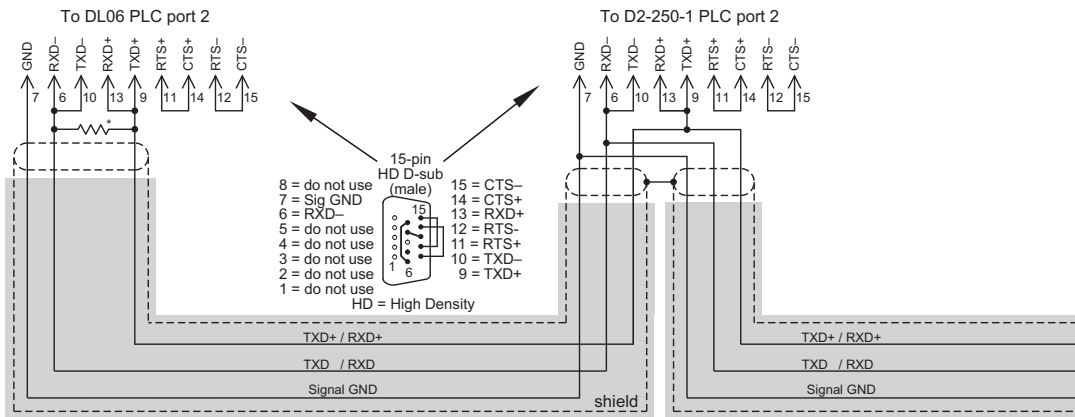
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more 6" Micro-Graphic Serial Port 2 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable

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

# RS-485 Multi-Drop Wiring Diagram Example



- Notes: 1. We recommend Belden 8103 shielded cable or equivalent.  
2. Wiring Diagram for this example, ZL-CMA15(L), on page 6-27

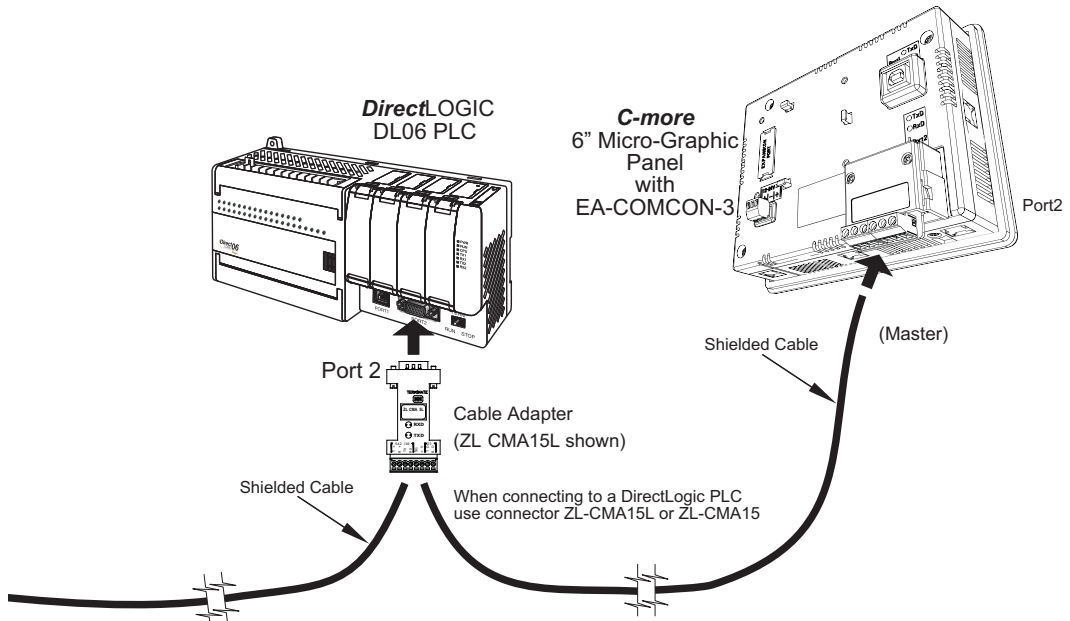


\* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

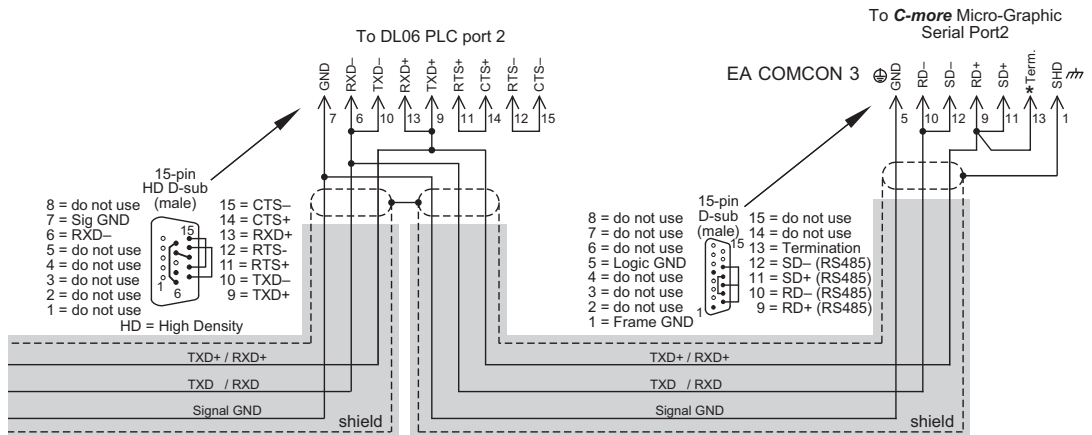
Typical RS-485 Multi-Drop Wiring Diagram



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



- Notes: 1. We recommend Belden 8103 shielded cable or equivalent.  
2. Wiring Diagram for this example, ZL-CMA15(L), on page 6-27



### 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 6" Micro-Graphic 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



# MAINTENANCE

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# CHAPTER 7

## In This Chapter...

|  |     |
|--|-----|
| Project Backup .....   | 7-2 |
| Check Operating Environment .....                                      | 7-2 |
| Check Operating Voltage .....  | 7-2 |
| Check Transmit and Receive Indicators .....                            | 7-3 |
| Check Physical Conditions .....  | 7-3 |
| Run Tests under the System Setup Screens .....                         | 7-4 |
| Check Settings under the System Setup Screens .....                    | 7-5 |
| Cleaning the Display Screen .....                                      | 7-5 |
| Check Project Functionality .....                                      | 7-6 |
| Checks from the <i>C-more</i> Micro-Graphic Programming Software ..... | 7-6 |

# 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.

24 VDC: The acceptable voltage range to the panel is 10.2-26.4 VDC (6.5W @ 10.2 VDC (630mA)).

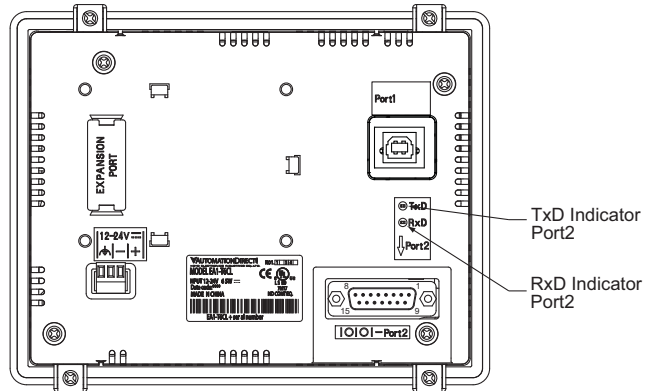


**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.

## 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 and data is being updated on the screen.

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



## Check Physical Conditions

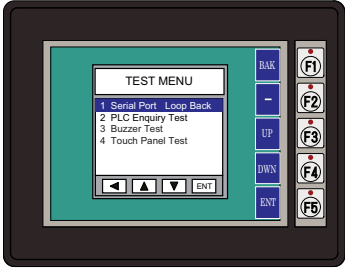
Make sure that harmful chemicals are not being used around the *C-more 6"* Micro-Graphic panel. Look for any deterioration of the panel's bezel and front display area. See **Chapter 2: Specifications** for a chemical compatibility list.

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**.

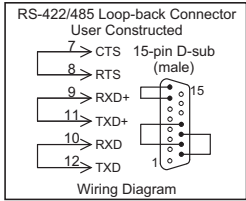
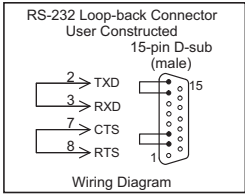
Check to make sure that none of the cooling vents around the inside section of the *C-more* Micro-Graphic panel are clogged with dust or debris. Also make sure that there is clearance around the panel as shown in **Chapter 4: Installation and Wiring**.

## Run Tests under the System Setup Screens

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



**Serial Port - Loop Back Test** - 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 to build 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.

**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.



## 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 beep and orientation. See **Chapter 5: System Setup Screens** for additional details.

**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

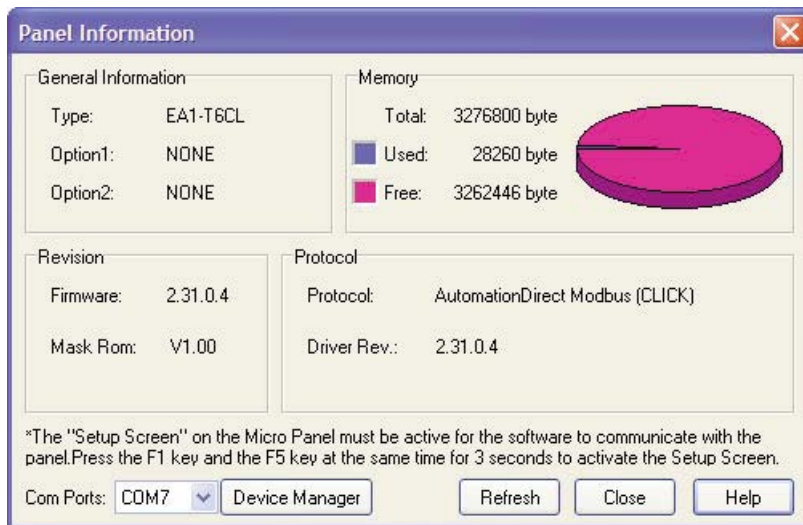
During a routine maintenance schedule is a good time to check the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application. 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:



# TROUBLESHOOTING

---



# CHAPTER 8

## In This Chapter...

|  |      |
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## Troubleshooting



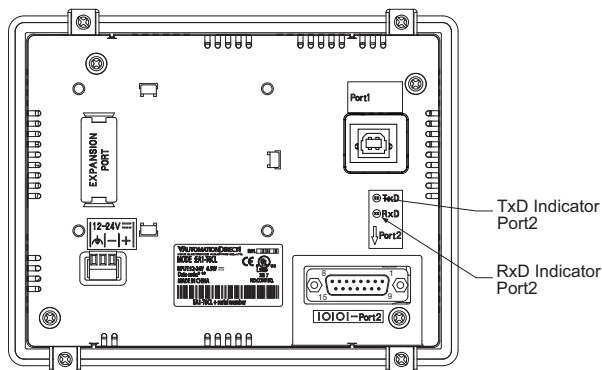
The following are some problems that may be encountered during the installation and operation of your *C-more*® Micro-Graphic panel. We have made some suggestions on what to check in order to correct the problem.

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

1. Powered from 5 VDC:
  - a. If the panel's display is blank, not responding, and the panel is powered from the PC via the USB programming cable, power the panel from a 12-24 VDC power source.
2. Powered from 12-24 VDC:
  - a. 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.
  - b. 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

1. If the panel's display is blank, but the panel has power, 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.
2. If there is communication activity, but the display is still blank, there is the possibility the program in the PLC is controlling the display. press the F1 and F5 keys simultaneously for 3 seconds. The panel will change to the System Setup Screen menu even if the screen is being forced to display a blank screen by the PLC program.
3. If the setup screen displays check the PLC program. It may have the screen in the off state by placing a 0 in the current screen tag.



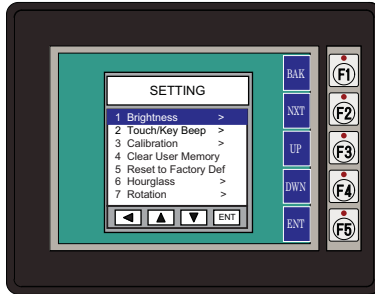
**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.



## Display is Dim



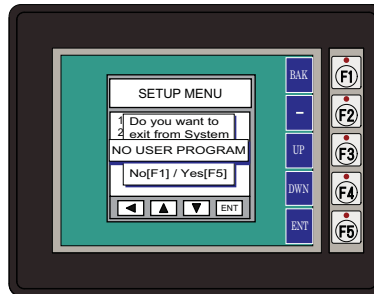
**NOTE:** When the panel is powered through Port1 from a connected PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. Connect an external 12-24 VDC power source when the panel is installed in its application for full brightness.



1. Press the F1 and F5 keys simultaneously for 3 seconds and the panel will bring up the the System Setup Screen menu.
2. Select the Setting menu, and then select item 1: Brightness. The default value is 10.
3. Adjust the current value from 1 to 16 and the panel's brightness should become greater as the value moves toward 16 and it should become less as the value moves toward 1.
4. If this does not happen, then the panel may need to be replaced. See note above.

## No User Program

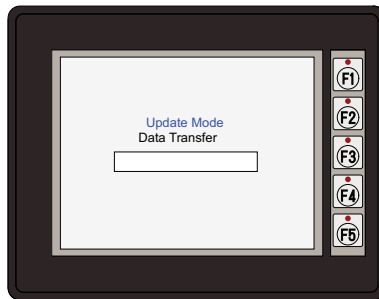
1. If the panel is displaying the message "No User Program" after it is powered up, then there is no project downloaded into the panel.
2. Using the EA-MG-PGMSW *C-more* Micro-Graphic Programming Software, download your project to the panel.



### Lost Firmware – ‘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 **Update Mode** screen as shown below. Perform Step 2 again.
- 4.) If there is still a problem, call Tech Support @ 770-844-4200 in the U.S.A.



### 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:

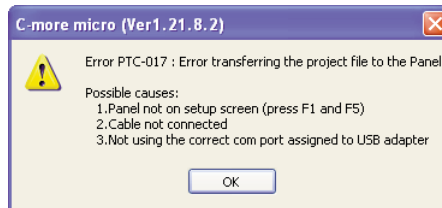
- 1.) Create a backup copy of the project on the PC. From the *C-more* Micro-Graphic programming software, read the project from the panel and save to a desired location.
- 2.) Update the programming software on the PC.
- 3.) Cycle power to the panel.
- 4.) Update the firmware to the panel using the **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.



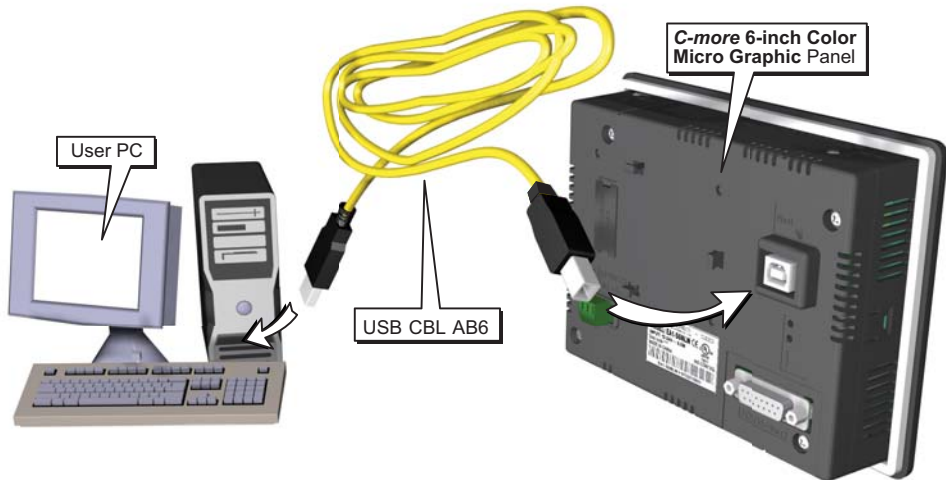
**NOTE:** Software and Firmware Version 2.5 or later is required with models EA1-T6CL. Available for free download at [www.automationdirect.com](http://www.automationdirect.com).

## 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 to make sure the panel is correctly connected to the USB port on the PC.



**NOTE:** The panel has an internal USB to serial converter at Port1. When the device is properly installed and the USB programming cable connects the panel to the PLC, the port will be identified as a serial communications port with an assigned COM port number.

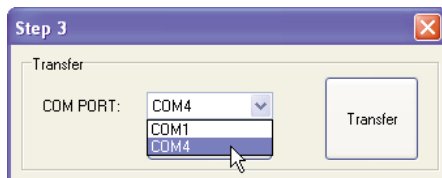
No communications between panel and PC continued top of next page.

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



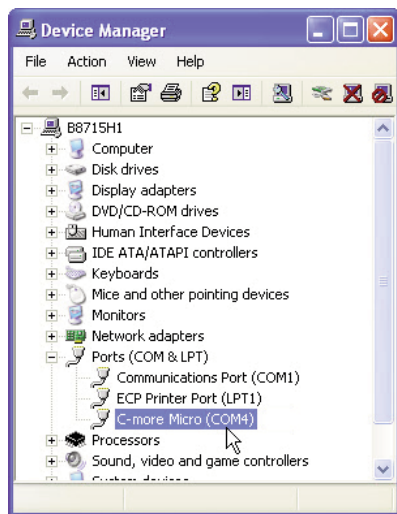
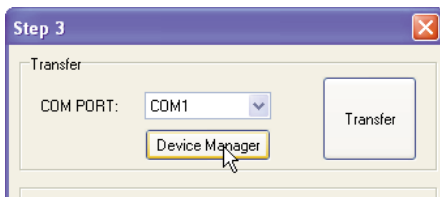
**NOTE:** The panel has an internal USB to serial converter at Port1. When the device is properly installed and the USB programming cable connects the panel to the PLC, the port will be identified as a serial communications port with an assigned COM port number.

3. Not using the correct COM port assigned to the USB connection - 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 **C-more Micro**.



COM4 is the USB port used in this example. If you cannot find the *C-more* Micro Comm Port under Ports (COM & LPT) in **Device Manager**, the USB driver may not be correctly installed or the driver has a problem. Follow these steps to re-install the driver:

1. Uninstall the *C-more* Micro-Graphic programming software.
2. Unplug the cable between the PC and the *C-more* Micro-Graphic panel.
3. Re-install the *C-more* Micro-Graphic programming software. Make sure the install USB driver checkbox is selected.
4. 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.
5. If the problem persists, call Technical Support at (770) 844-4200, available from 9:00 A.M. to 6:00 P.M. Eastern Time.



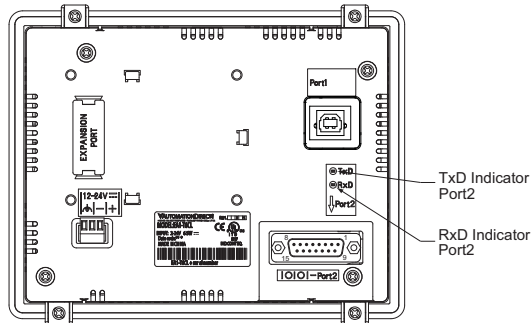
## No Communications between Panel and PLC

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

1. Check the TxD and RxD status indicators of Port2. 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.

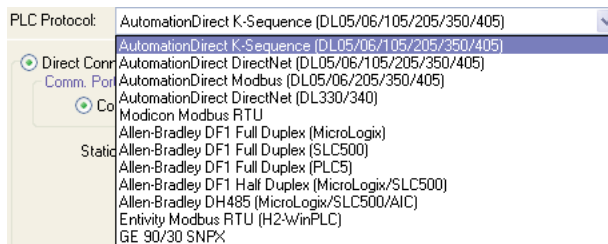


**NOTE:** For communications to be present between the panel and PLC, the panel must contain a project requesting data from the PLC.



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

1. 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.



2. The cable is bad and needs to be replaced - Try a proven cable.
3. Test panel serial port. See Chapter 5, Serial Port - Loop Back Test. If possible switch the panel with a panel that is communicating properly.
4. The serial port on the PLC is defective. If possible switch the panel with a panel that is communicating properly. Call the AutomationDirect returns department at (800) 633-0405



**NOTE:** 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.

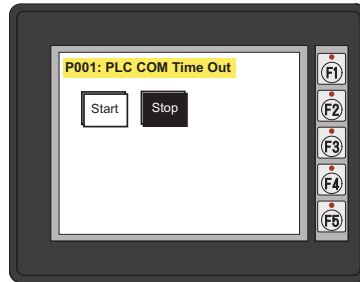
If a *C-more* Micro-Graphic communication error does occur, the error message will be displayed in the upper left of the panel's display screen along with the error code number. The error code with error message will blink off and on.



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

## 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.

### 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.

## 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.<br>Cycle power at the panel.<br>See Chapter 8 for Electrical Noise Problems.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.   |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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.  |
| R102                       | External power fail. Reconnect USB cable.                            | The panel was powered in High Power mode (24 VDC power supply.) The 24 VDC power has been lost and the panel is now running on USB bus power. Either re-establish the 24 VDC power connection or remove all power connections and then reconnect the USB cable for the panel to run in Low-Power mode via the USB connection. |

### Reset to Factory Default

Factory default values can be reset by pressing F2 and F4 while cycling power to the panel. The Factory Default values are:

- Brightness value of 10
- The internal audible beeper enabled
- Forced touch panel calibration
- User program cleared from memory
- Hourglass icon delay of 350 ms.
- Horizontal orientation



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**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, VFDs, etc.

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

# REPLACEMENT PARTS

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## In This Chapter...

|  |     |
|--|-----|
| Replacement Parts Overview .....                 | 9-2 |
| 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> 6" 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-MG6-BZ2(P)  |
| EA-MG-S6ML-FKL  | Replacement function key label insert for <i>C-more</i> 6" 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

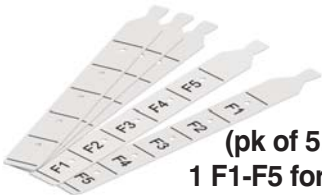


(pk of 5)

### 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.**



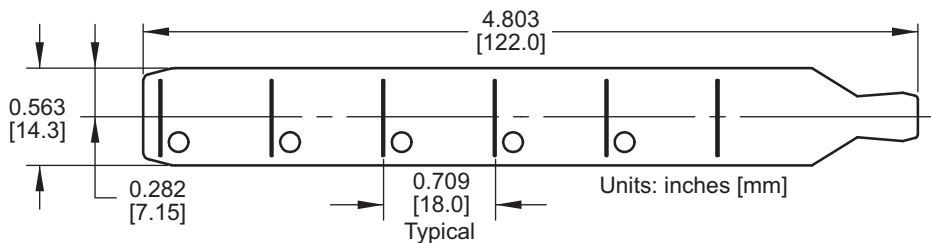
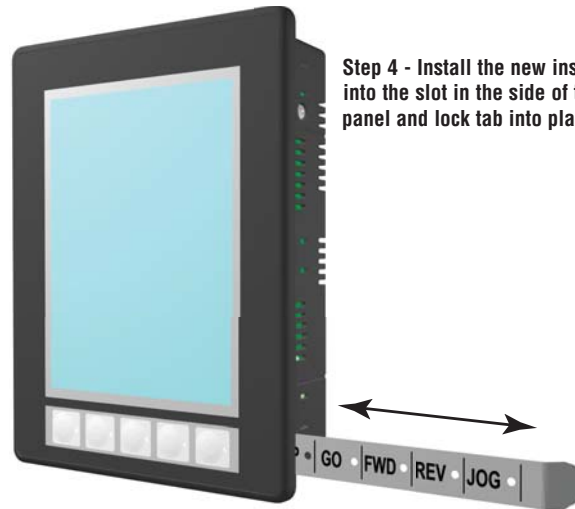
**Step 2 - Remove the protective film from the blank key label insert.**



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

---



## In This Appendix...

|   |      |
|---|------|
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| Siemens PPI Protocol – PLC Error Code Table .....             | A-29 |



Introduction

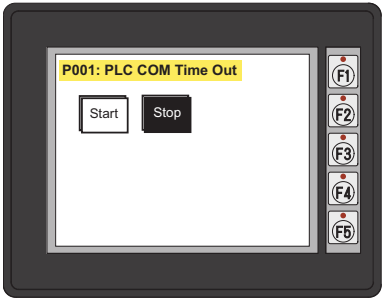
The *C-more*® Micro-Graphic panels are capable of communicating over RS232, RS422 and RS485 serial networks. They communicate with CLICK PLC's, all controllers in the *Direct LOGIC* family of PLCs utilizing various protocols and certain 3rd party PLCs. For a complete list of the supported PLCs and protocols, 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 continues on the next page.

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

A

| 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.<br>Data was sent to the PLC via the Serial Port.<br>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.                    |

## Modbus Protocols Error Code P499 Explanation

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

AutomationDirect CLICK

AutomationDirect DirectLOGIC - Modbus (Koyo)

Modicon Modbus RTU

Entivity Modbus RTU



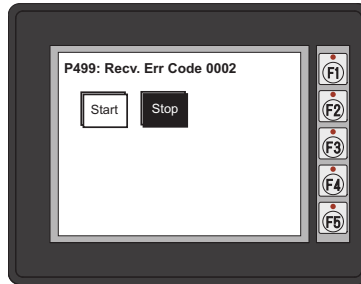
**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active.

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

## 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 users manual for additional information.

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

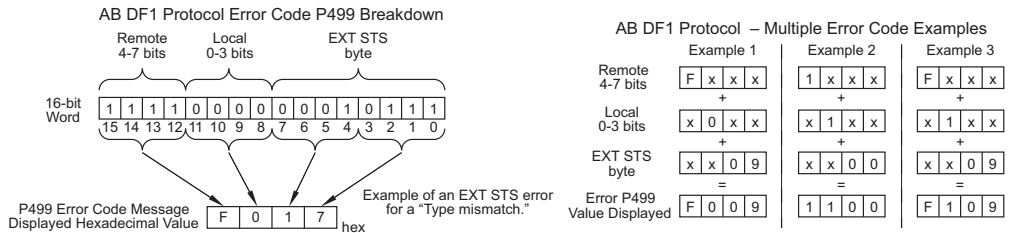
## DirectLOGIC – DirectNET PLC Error Codes

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

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# 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.



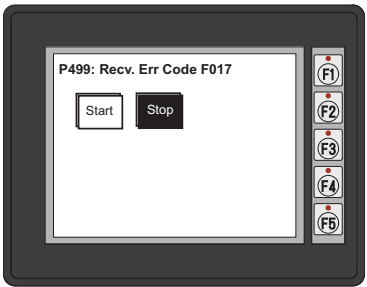
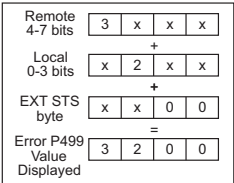
## Allen-Bradley PLC Error Code Displayed Example

**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 users manual for additional information.

### PLC Errors for Allen-Bradley DF1 Protocol, Remote STS Errors (4-7 bits)

| Panel Error Code<br>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<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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 code for the Allen-Bradley DF1 Protocol continue 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<br>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;<br>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 users manual for additional information.

**PLC Errors for Allen-Bradley DH485 Protocol, Local STS Errors (0-3 bits)**

| Panel Error Code<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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<br>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 continue on the next page.



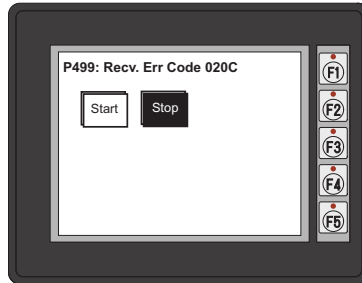
Allen-Bradley DH485 Protocol – PLC Error Code Tables (cont'd)

| PLC Errors for Allen-Bradley DH485 Protocol, EXT STS Command Code for F0 Command |   |
|--|---|
| Panel Error Code<br>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.

### 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 users manual for additional information.

| PLC Errors for GE SNPX Protocol (Major) |  |
|---|--|
| Panel Error Code<br>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.<br>(Series 90-70 PLC CPUs only)   |
| 0x0051                                  | Problem with getting mail from the slave Service Request task.<br>(Series 90-70 PLC CPUs only)   |
| 0x0055                                  | Slave SNP task timed out before receiving an SRP response.<br>(Series 90-70 PLC CPUs only)   |
| 0x0056                                  | Slave SNP task could not find the requested datagram connection.<br>(Series 90-70 PLC CPUs only)   |
| 0x0057                                  | Slave SNP task encountered an error in trying to write the datagram.<br>(Series 90-70 PLC CPUs only)   |
| 0x0058                                  | Slave SNP task encountered an error in trying to update the datagram.<br>(Series 90-70 PLC CPUs only)  |

PLC generated error codes for the GE 90-30, 90-70 and VersaMax SNPX protocol continue 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<br>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.<br>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.<br>(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.<br>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;<br>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.<br>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.<br>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.<br>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.<br>Modem is unable to complete the requested connection.<br>Check the local and remote modems and the telephone line.   |
| PLC Error 0x070F                                       | Queue Full indication from Service Request Processor in slave PLC CPU.<br>The slave is temporarily unable to complete the service request.<br>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<br>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;<br>the SNP-X slave device cannot return the data in an X-Response message.<br>(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.<br>(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.<br>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.<br>Must be 1 for I/O Fault Table, or 2 for PLC Fault Table.  |
| 0x100F   | Unexpected Service Request Processor error.<br>(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.<br>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.<br>Must be 0 for Series 90-70, or 1 for Series 90-30 or Series 90-20.  |
| 0x170C   | Invalid datagram type.<br>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 continue 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<br>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).<br>Must use a smaller data length. Use multiple COMMREQs if necessary.  |
| 0x1D0C   | Invalid SNP-X communication session type.<br>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.<br>The Broadcast SNP ID is not permitted in a single-slave SNP-X session.<br>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.<br>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.<br>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.<br>A maximum of two retries are permitted.<br>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.<br>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 continue 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<br>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.<br>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.<br>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).<br>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 continue 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<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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 continue 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<br>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 continue 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<br>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 continue 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<br>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 *C-more* 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.

## Mitsubishi Q / QnA Series – PLC Error Codes

The following table lists the errors that can be generated by the Mitsubishi Q / QnA Series PLC when using the Q / QnA 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 users manual for additional information.

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |   |
|---|---|
| Panel Error Code<br>P499 Hex Value                  | Description   |
| 0x4000  | Serial communications checksum error. Check cable and grounding.  |
| 0x4001  | Unsupported request sent to PLC.  |
| 0x4002  | Unsupported request sent to PLC.  |
| 0x4003  | Global request sent to PLC that cannot be executed.   |
| 0x4004  | System protect switch is on and request was sent that cannot be executed. Also PLC, may still be booting up.                                  |
| 0x4005  | Packet sent is too large according to size request in header.   |
| 0x4006  | Serial communications could not be initialized.   |
| 0x4008  | CPU busy or buffer full.  |
| 0x4010  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4013  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4021  | Drive memory does not exist.  |
| 0x4022  | File (ZR memory) does not exist.  |
| 0x4023  | File (ZR memory) name and File (ZR memory) number do not match.   |
| 0x4024  | File (ZR memory) inaccessible by user.  |
| 0x4025  | File (ZR memory) is locked by another device.   |
| 0x4026  | File (ZR memory) password required.   |
| 0x4027  | Specified range is out of File (ZR memory) range.   |
| 0x4028  | File (ZR memory) already exist.   |
| 0x4029  | Specified File (ZR memory) capacity cannot be retrieved.  |
| 0x402A  | Specified File (ZR memory) is abnormal.   |
| 0x402B  | The requested data cannot be executed in the specified drive memory.  |
| 0x402C  | The requested operation cannot be executed presently.   |
| 0x4030  | The specified data type does not exist. Check the CPUs allowable data types.  |
| 0x4031  | The specified address is out of range. The data type requested may need to be expanded in GX developer. The CPU may not allow this data type. |
| 0x4032  | Address qualification is incorrect.   |
| 0x4033  | Cannot write to system area.  |
| 0x4034  | Request cannot be executed because completion address for an instruction cannot be turned on.   |

PLC generated error codes for the Mitsubishi Q / QnA protocol continue on the next page.

## Mitsubishi Q / QnA Series – PLC Error Codes (cont'd)

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |  |
|---|--|
| Panel Error Code<br>P499 Hex Value                  | Description  |
| 0x4040  | Module doesn't support request.  |
| 0x4041  | Request is out of module's range.  |
| 0x4042  | Module cannot be accessed.   |
| 0x4043  | Address for specified module is incorrect.                                     |
| 0x4044  | Hardware problem exist for specified module.                                   |
| 0x4050  | Request cannot be executed because memory card protect switch is on.           |
| 0x4051  | Specified memory cannot be accessed.   |
| 0x4052  | Specified memory attribute is read only and cannot be written to.              |
| 0x4053  | Error occurred when writing to specified memory location.                      |
| 0x4080  | Request data error. Check cabling and electrical noise.                        |
| 0x4082  | Specified request is already being executed.                                   |
| 0x408B  | The remote request cannot be performed.  |
| 0x40A0  | A block number out of range was specified.                                     |
| 0x40A1  | The number of blocks requested exceeds the range of the PLC.                   |
| 0x40A2  | A step number was specified out of range.                                      |
| 0x40A3  | Step range limit exceeded.   |
| 0x40A4  | Specified sequence step number is out of range.                                |
| 0x40A5  | Specified SFC device is out of range.  |
| 0x40A6  | Block specification and step specification are incorrect.                      |
| 0x4100  | CPU module hardware fault.   |
| 0x4101  | Serial communication connection incorrect.                                     |
| 0x4105  | CPU module internal memory fault. Bad CPU.                                     |
| 0x4106  | CPU is in initialization. Wait until CPU is booted up.                         |
| 0x4107  | Specified function not supported by this CPU. Check memory types for that CPU. |
| 0x4110  | Specified function not supported because CPU is in Stop. Put CPU in Run.       |
| 0x4111  | System is not up yet. Wait until system is up before performing request.       |
| 0x4A01  | The network number specified does not exist. Routing not supported in C-more.  |
| 0x4A02  | Station number specified does not exist. Routing not supported in C-more.      |

## 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<br>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<br>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 continue on the next page.



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

| PLC Error Codes for Omron FINS     |  |
|------------------------------------|--|
| Panel Error Code<br>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 continue on the next page.

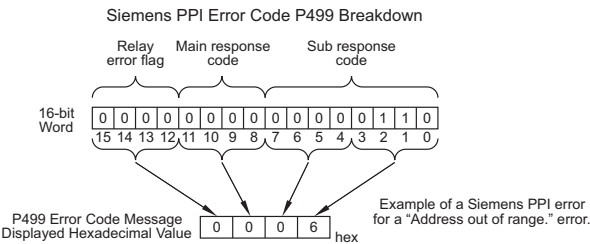
## Omron FINS Protocol – PLC Error Code Table (cont'd)

| PLC Error Codes for Omron FINS     |  |
|------------------------------------|--|
| Panel Error Code<br>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.                    |

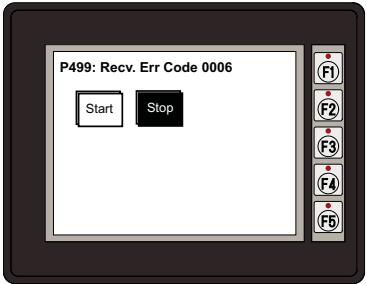
A

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<br>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**

---



## **In This Appendix...**

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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.<br>Cycle power at the panel.<br>See Chapter 8 for Electrical Noise Problems.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.   |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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.  |
| R102                       | External power fail. Reconnect USB cable.                            | The panel was powered in High Power mode (24 VDC power supply.) The 24 VDC power has been lost and the panel is now running on USB bus power. Either re-establish the 24 VDC power connection or remove all power connections and then reconnect the USB cable for the panel to run in Low-Power mode via the USB connection. |

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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*® 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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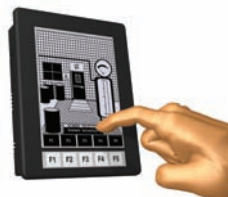


## Product Overview



**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

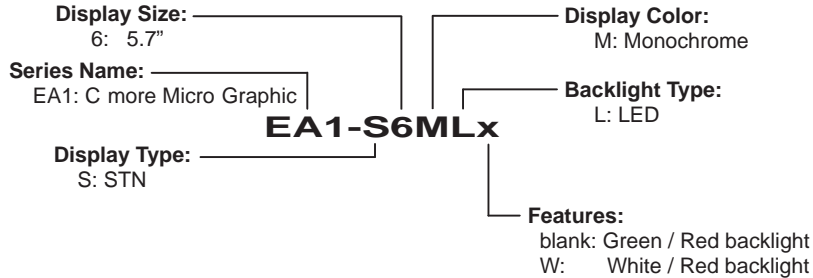
| UL/CUL/CE Certification Numbers           |         |         |           |          |
|---|---------|---------|-----------|----------|
| Name                                      | UL/CUL  | UL508   | CE        | ISO-9000 |
| C-more Micro-Graphic Panels & Accessories | E157382 | E157382 | EN61131-2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



## Part Number Key

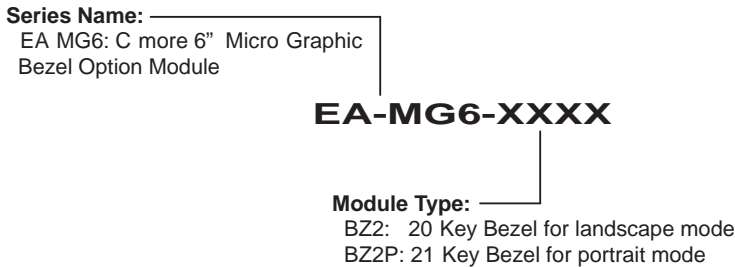
### Panel Part Number Key

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



### Bezel Part Number Key

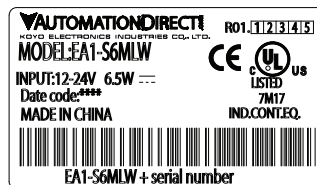
The optional *C-more* 6" Micro-Graphic keypad bezel part numbers consist of the following:



## 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)

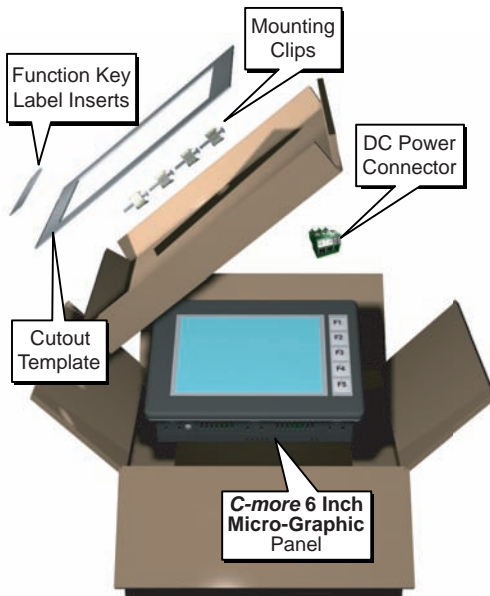
# Quick Start Steps

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)
- DC power connector (EA-MG-DC-CON)
- cutout template
- mounting clips
- gasket
- 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**

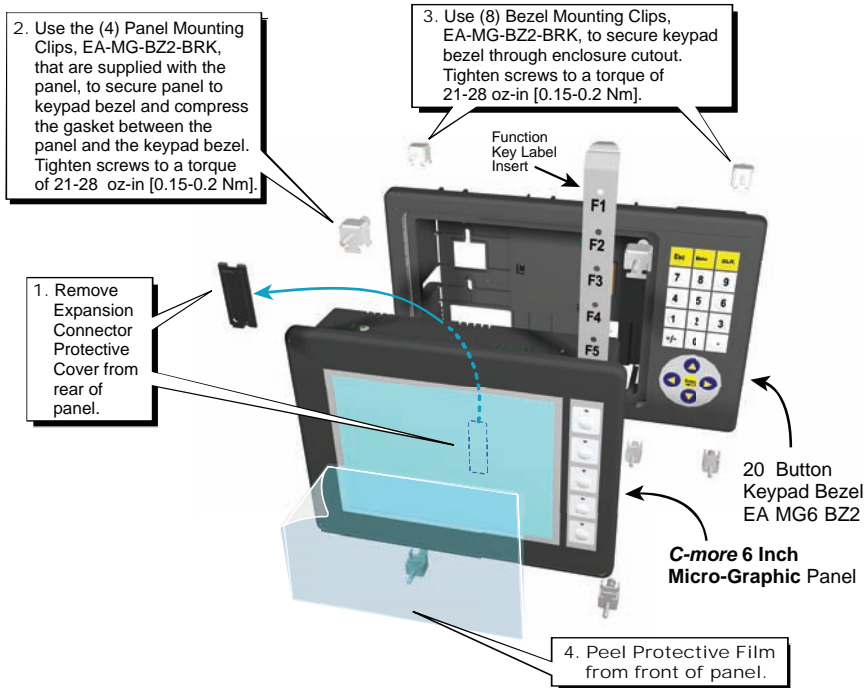


**21-Button Vertical Keypad Bezel  
EA-MG6-BZ2P**



## 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

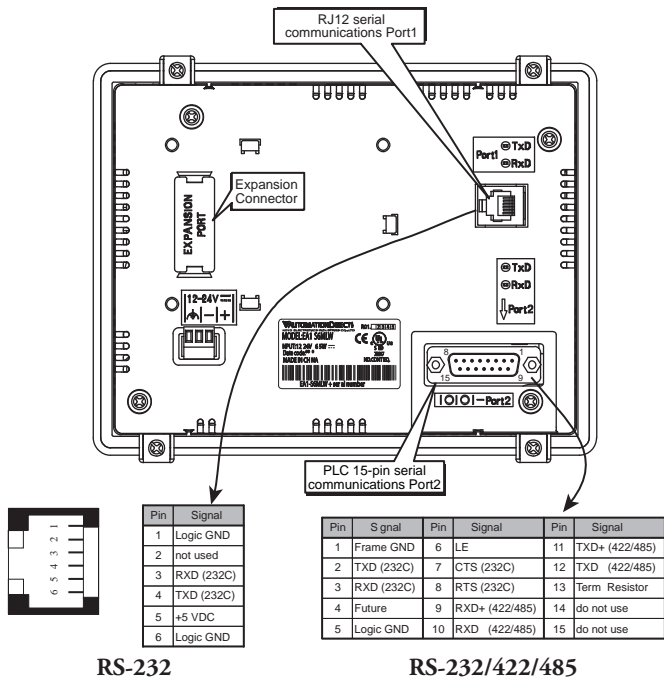
**Clear Screen Overlay  
EA-6-COV2**



### 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 AutomationDirect CLICK™ and 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 6" 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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.



**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

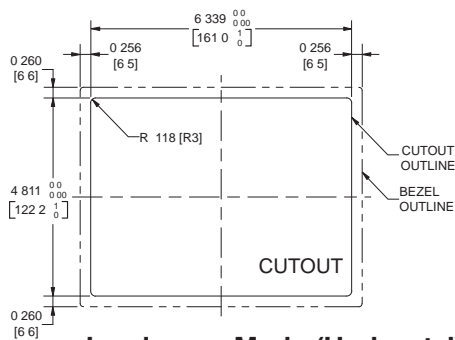
The *C-more* 6" Micro-Graphic panel can be mounted through a cutout in an enclosure by using the template that is provided with the panel, or using the dimensions shown below. Cutout dimensions for the 20-button landscape and 21-button portrait keypad bezel options are also shown below. The keypad bezels 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].

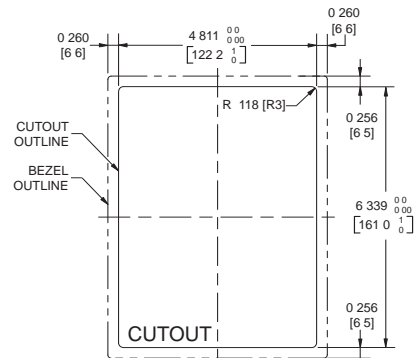
See **Chapter 2: Specifications** for additional product dimensions.

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

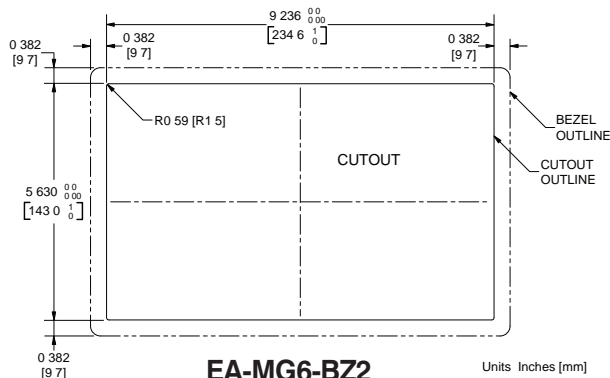
### **EA1-S6ML & EA1-S6MLW** **Panel Cutout**



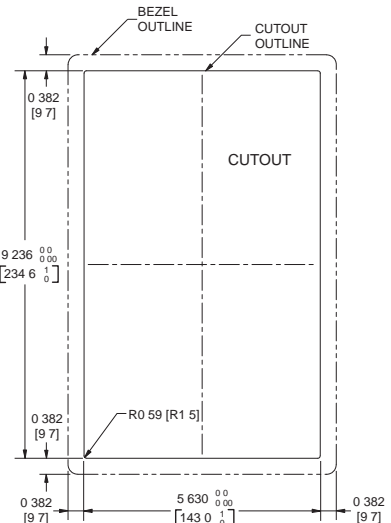
**Landscape Mode (Horizontal)**



**Portrait Mode (Vertical)**



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

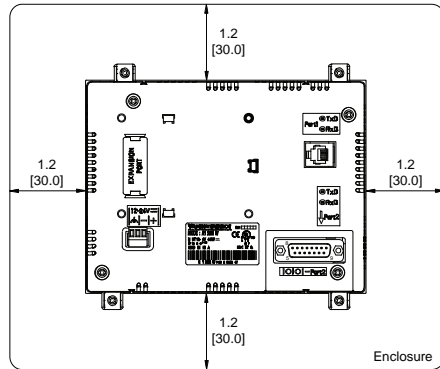


**EA-MG6-BZ2P**  
**Portrait (Vertical)**  
**Keypad Bezel Cutout**

### Enclosure Clearances

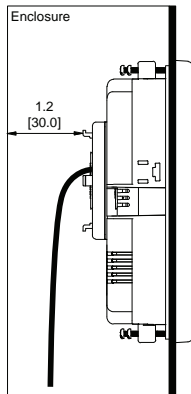
A 1.2" [30mm] minimum clearance is required inside an enclosure for proper ventilation of the *C-more* Micro-Graphic panel.

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



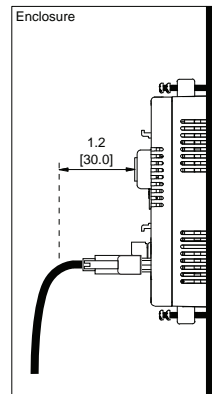
units: inches [mm]

**Panel with Keypad  
Bezel**



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

**Panel only**



**EA1-S6ML(W)**



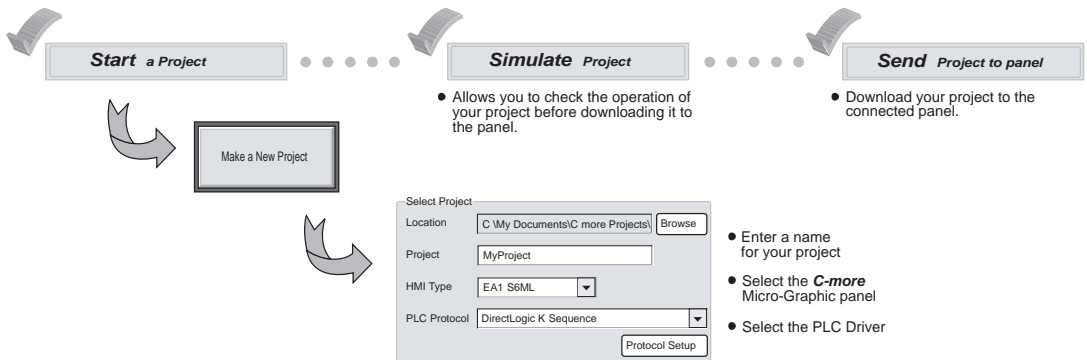
**NOTE:** Additional clearance inside the enclosure is required when connecting to the 15-pin serial communications port (Port2).

## 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); 512 MB free RAM (1GB recommended) for Vista
- 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.



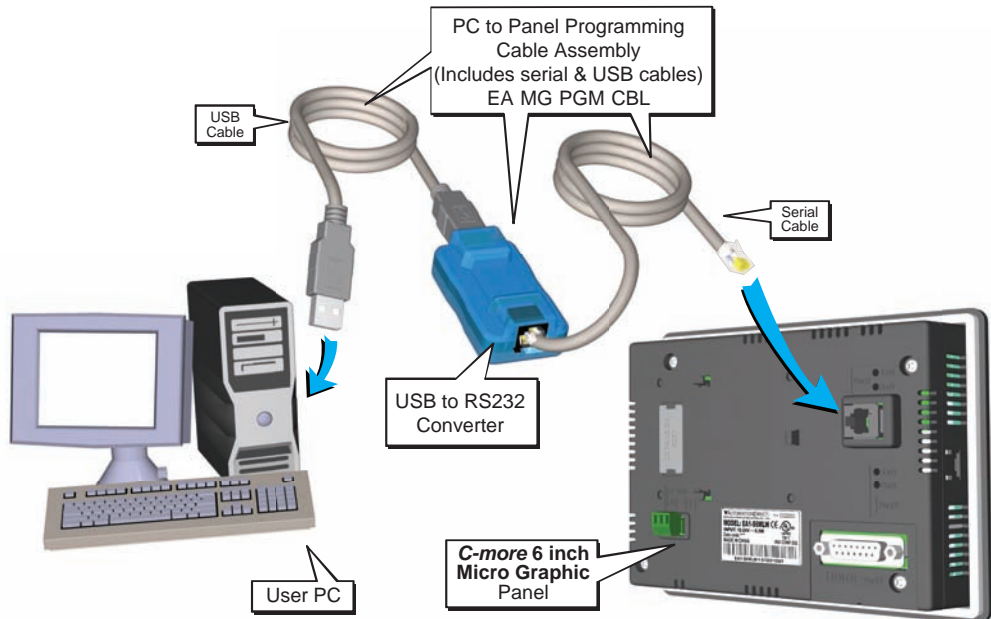


### Step 6 – Connect *C-more* 6” Micro-Graphic Panel to Computer

**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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.

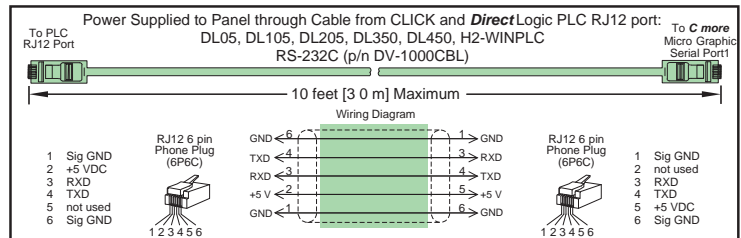
## Step 7 – Providing Power to the *C-more 6"* Micro-Graphic Panel

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.

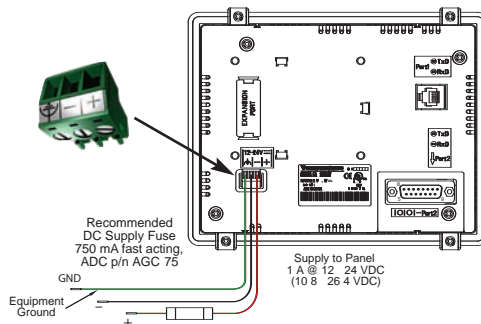
1

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



**NOTE:** When the 6" 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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.

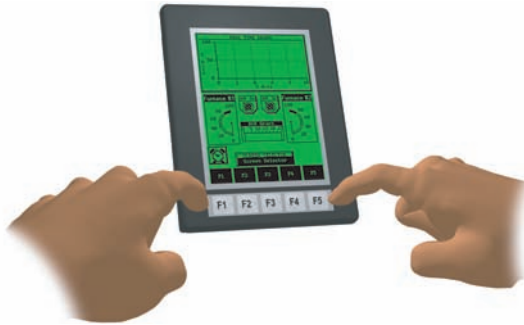
### Panel Powered from a DC Power Source - Wiring Diagram



**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.

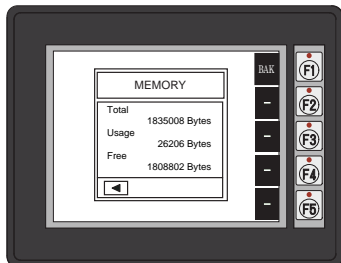
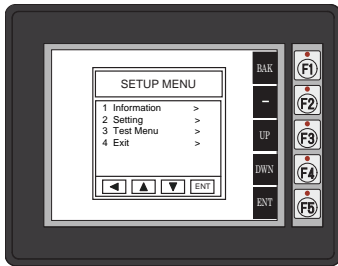
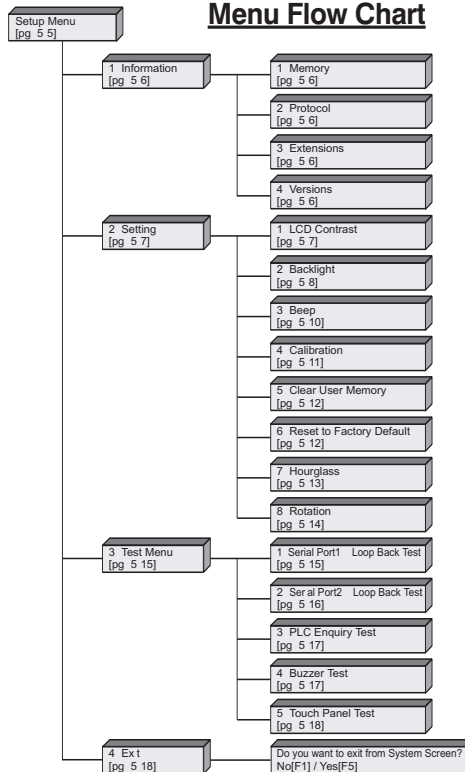


From the Setup Menu, information about the panel can be obtained, settings can be adjusted, and panel functions can be tested.



**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 & CablesAvailable PLC Protocols

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

1

Available purchased cables

| Cable Description   | Cable Part No.    |
|---|-------------------|
| <b><i>Cables used with serial Port1</i></b>   |                   |
| AutomationDirect CLICK, <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)<br><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>  |

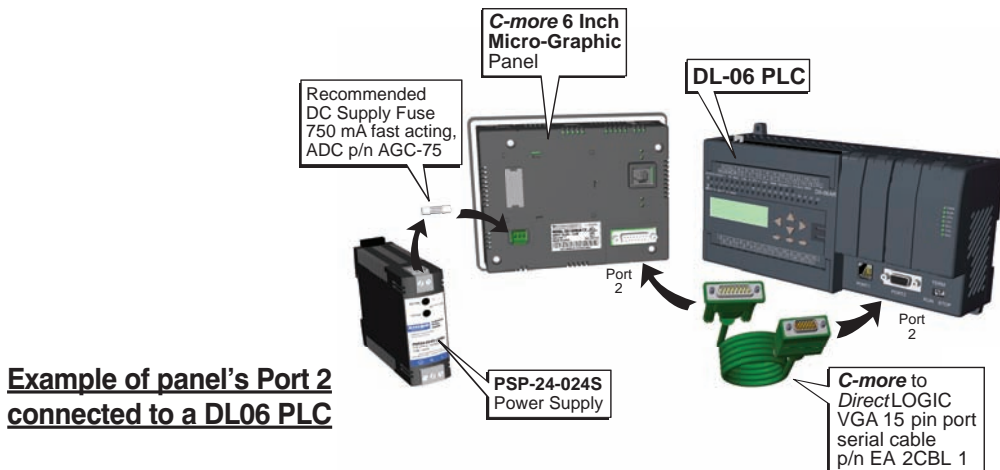
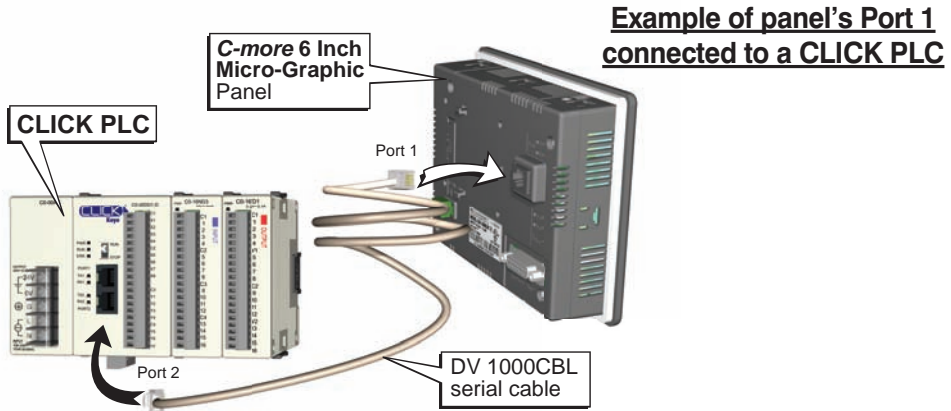
| Cable Description  | Cable Part No.         |
|--|------------------------|
| <b><i>Cables used with serial Port2</i></b>  |                        |
| AutomationDirect CLICK, <b>Direct</b> LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C) | <b>EA-2CBL</b>         |
| <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.



# SPECIFICATIONS

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# CHAPTER 2



## In This Chapter...

|                              |     |
|------------------------------|-----|
| Available Models .....       | 2-2 |
| Model Specifications .....   | 2-3 |
| Panel Dimensions .....       | 2-5 |
| Communications Ports .....   | 2-6 |
| Chemical Compatibility ..... | 2-7 |

Available Models

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             |  | 5.7-inch <i>C-more</i> Micro-Graphic Touch Panel with STN LCD monochrome, 320x240 dot display. The panel has red and green LED backlights. Supports 5 selectable backlight colors (Red, Green, Amber, Lime, and Yellow). Includes 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            |  | 5.7-inch <i>C-more</i> Micro-Graphic Touch Panel with STN LCD monochrome, 320x240 dot display. The panel has white and red LED backlights. Supports 5 selectable backlight colors (White, Pink1, Pink2, Pink3, and Red). Includes 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),<br>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)<br>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<br>6 o'clock axis → 40 degrees<br>12 o'clock axis → 20 degrees                          |
| <b>Backlight:</b>             |  |
| • Type                        | LED  |
| • Color                       | Model EA1-S6ML : 5 user defined colors:<br>Red, Green, Amber, Lime, and Yellow   |
|                               | Model EA1-S6MLW: 5 user defined colors:<br>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.<br>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)<br>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.

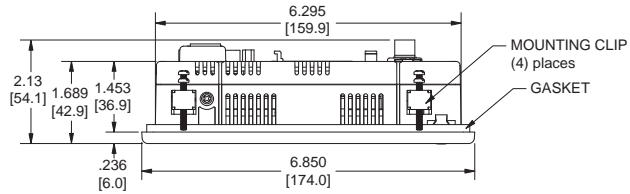


## Model Specifications (cont'd)

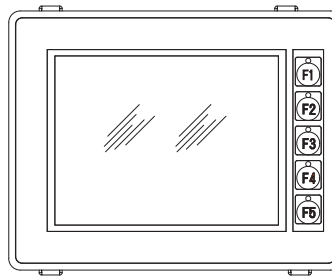
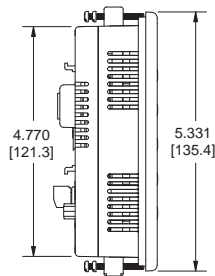
| Specifications (cont'd)              |   |   |
|--------------------------------------|---|---|
| Screen Objects:                      |   |   |
| • Functional Devices                 | Push Button, Switch, Indicator Button, Indicator Light, Graphic Indicator Light, Numeric Display, Numeric Entry, 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, Key Configuration Object, 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),<br>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,<br>750 mA, 250 VAC, AGC 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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>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)<br>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

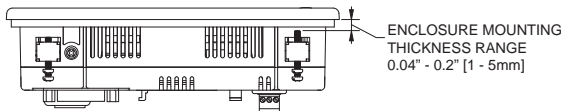
## Panel Dimensions



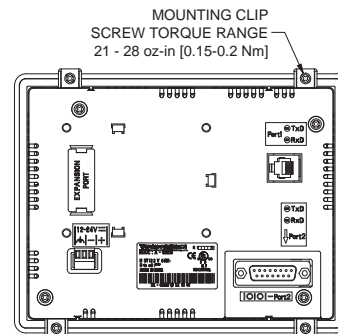
Units: Inches [mm]



## Enclosure Thickness

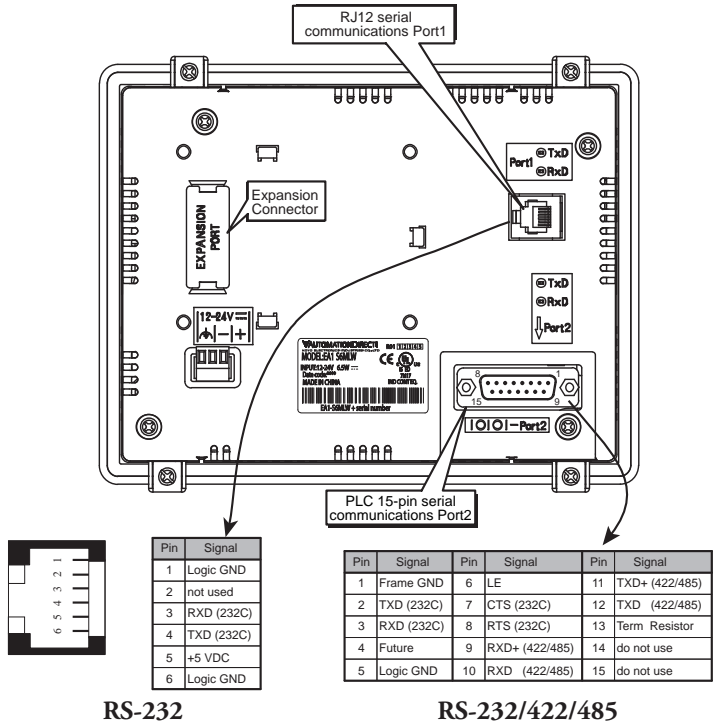


## Mounting Clip Screw Torque



# 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 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.

| Chemicals                     | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[Density %, Temperature °C] |
|---------------------------------------|--|--|--|--|
| Ammonia liquid                        |  | Good                                       |  |  |
| Ammonia water                         |  | [12%] Not Usable                           |  |  |
|                                       |  | [28%] Not Usable                           |  |  |
| Ammonium carbonate                    |  | Excellent                                  |  |  |
| Ammonium chloride                     |  | Excellent                                  |  |  |
| Ammonium hydroxide<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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                     |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

| Chemicals                       | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Hypos] |  | Excellent                                  |  |  |
| Dibutyl phthalate<br>[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                                  |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

| Chemicals         | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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]<br>Not Recommended              |  |  |
|                               |  | [5-50, 20 °C]<br>Not Recommended           |  |  |
|                               |  | [30, 20 °C] Not Usable                     |  |  |
| Hydrogen sulfide              |  | Excellent                                  |  |  |
| Hydorquinone                  |  | 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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[Density %, Temperature °C] |
|-------------------------------|--|--|--|--|
| Mercuric chloride             |  | Excellent                                  |  |  |
| MEK                           | Not Usable                                       |  |  | Good   |
| Mercury                       |  | Excellent                                  |  |  |
| Metacresol                    |  |  |  | Not Usable   |
| Methyl acetate                |  | Not Usable                                 |  |  |
| Methyl alcohol                |  | Not Recommended                            |  | Excellent  |
| Methyl Benzoate               |  |  |  | Not Usable   |
| Methyl chloride               | Not Usable                                       | 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                   |  | [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                     |  |  |
| Nitrobenzene                  |  | Not Usable                                 |  | Not Usable   |
| Nitroethane                   |  | Not Usable                                 |  |  |
| Nitromethane                  |  | Not Usable                                 |  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

| Chemicals              | Screen Sheet – PC<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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 permanganate |  | [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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key Sheet – PET<br>[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<br>[Glauber's salt] |  | Good                                       |  |  |
| Sodium sulfite                     |  | Excellent                                  |  |  |
| Soybean oil                        |  | Excellent                                  |  |  |
| Stannic chloride                   |  | Good                                       |  |  |
| Steam                              |  | [below 150 degrees]<br>Not Usable          |  |  |
| Steam                              |  | [above 150 degrees]<br>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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] | Bezel Key – PET<br>[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<br>[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**<sup>®</sup> 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

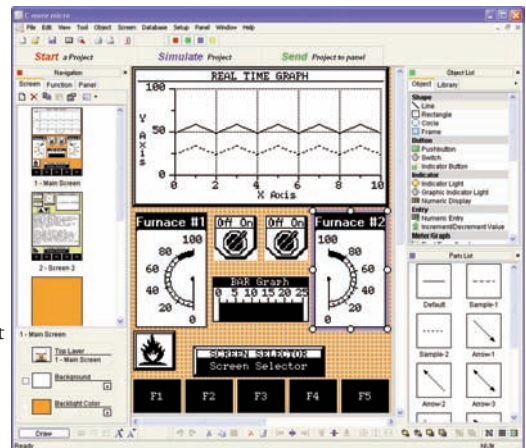
Lets you find the object you want fast. Just drag and drop it on the screen.

### 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 6"** 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); 512 MB free RAM (1GB recommended) for Vista
- 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








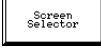
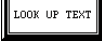



# Micro-Graphic Programming Software (cont'd)

## C-more Micro-Graphic Panel Objects

| Object   | Graphic | Object   | Graphic |
|--|---------|--|---------|
| <p>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.</p>  |         | <p>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.</p>  |         |
| <p>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.</p>   |         | <p>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.</p> |         |
| <p>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.</p>   |         | <p>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.</p>               |         |
| <p>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.</p>  |         | <p>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. One point is added at each refresh.</p>  |         |
| <p>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.</p>  |         | <p>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 line is drawn in its entirety at each refresh.</p>  |         |
| <p>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.</p>   |         | <p>The <b>Analog Meter</b> object is used to display the current value of a Tag Name.</p>  |         |
| <p>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.</p> |         | <p>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.</p>   |         |
| <p>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.</p>   |         | <p>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 C-more Micro-Graphic display only supports two colors, black and white.</p>  |         |
| <p>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.</p>      |         | <p>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</p>                          |         |

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   |
| <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>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>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>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.   |  |
| 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>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>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>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>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>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. |  |

## 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.

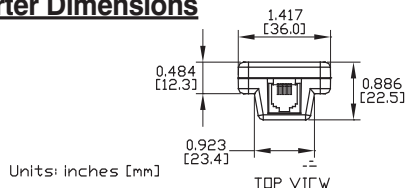
- Connect the USB programming cable ( included) from a USB port type A on the PC to the USB type B port on the converter (included). Next connect the serial programming cable from the converter's RJ12 port to the panel's RJ12 serial port. The panel receives power from the USB port of the PC that it is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

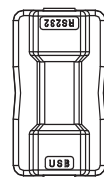
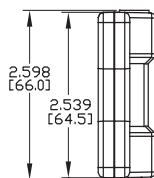
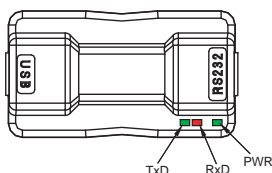


### Converter Dimensions

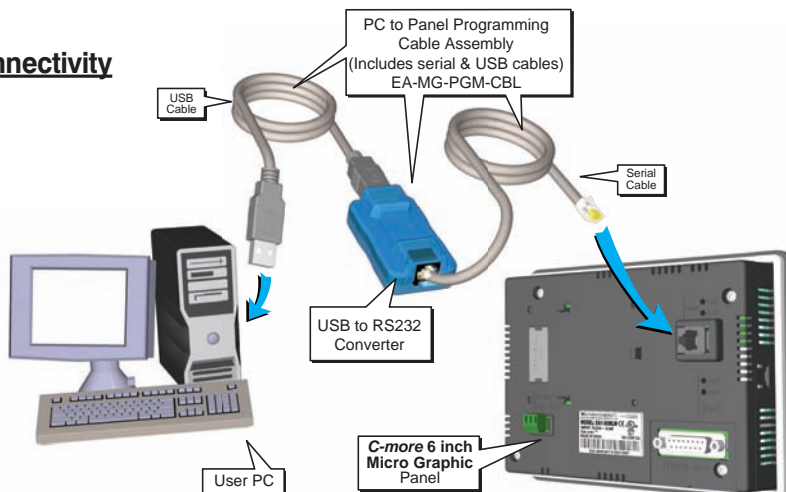


### Converter Status LEDs

LED Status Indicators



### 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 <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. |
| Hardware:  |  |
| • USB Interface  | USB Specification Rev. 1.1<br>Connector: USB Type B jack to accept USB Type B cable plug   |
| • Serial Interface   | RS232 (EIA-232-E)<br>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)<br>[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. |  |

## 20-Button Landscape (Horizontal) Keypad Bezel

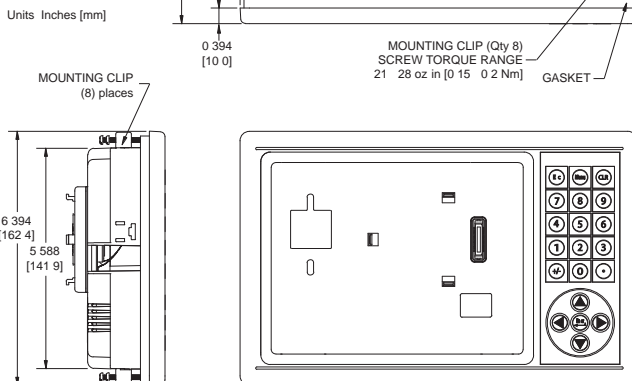
The 20-button keypad bezel is designed to be used with the *C-more* 6" Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, a full numeric keypad, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object to allow 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

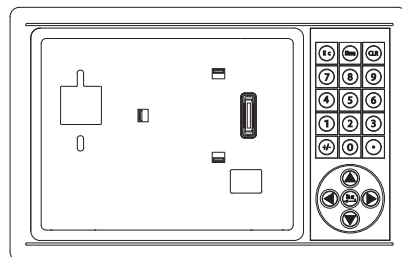
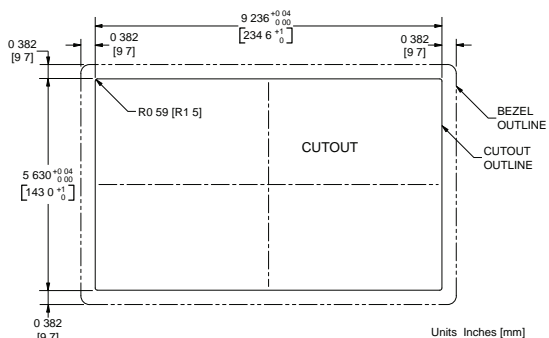


### Dimensions

Units Inches [mm]

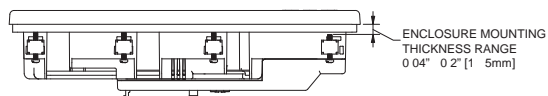


### Panel Cutout



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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>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)<br>[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

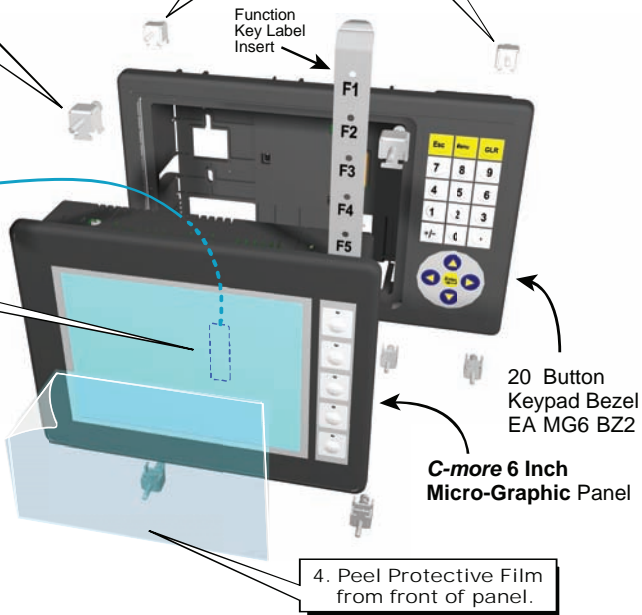
3

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.

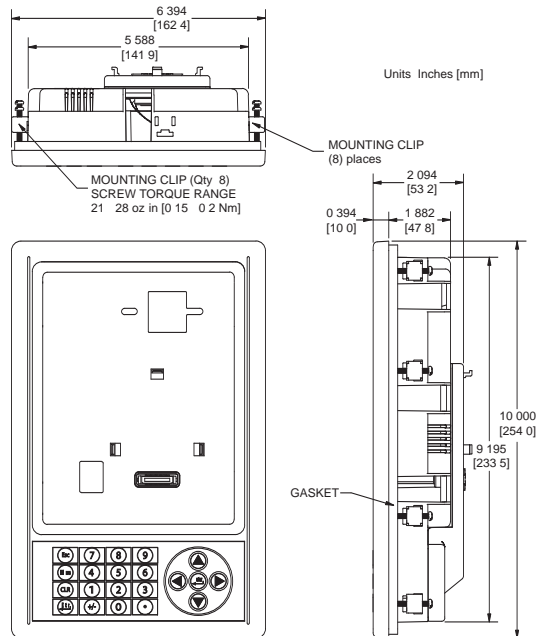
## 21-Button Portrait (Vertical) Keypad Bezel

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.

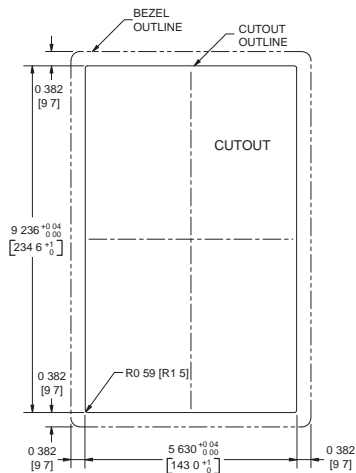
### EA-MG6-BZ2P



### Dimensions

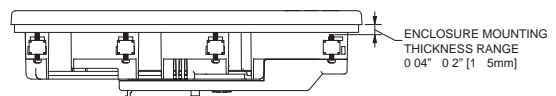


### Panel Cutout



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<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>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)<br>[162.4 mm x 254.0 mm x 63.2 mm]   |
| • Weight                              | 26.1 oz. [740 g]   |

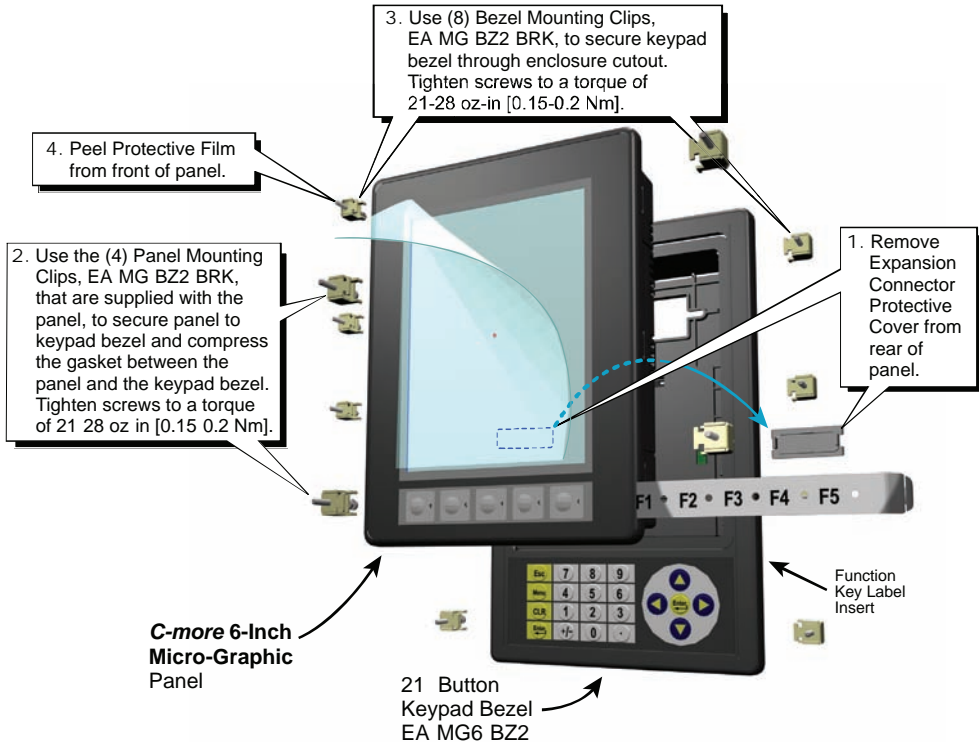
*C-more 6" Micro Graphic Panel  
installed in a 21 button Keypad  
bezel EA-MG6-BZ2P*



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

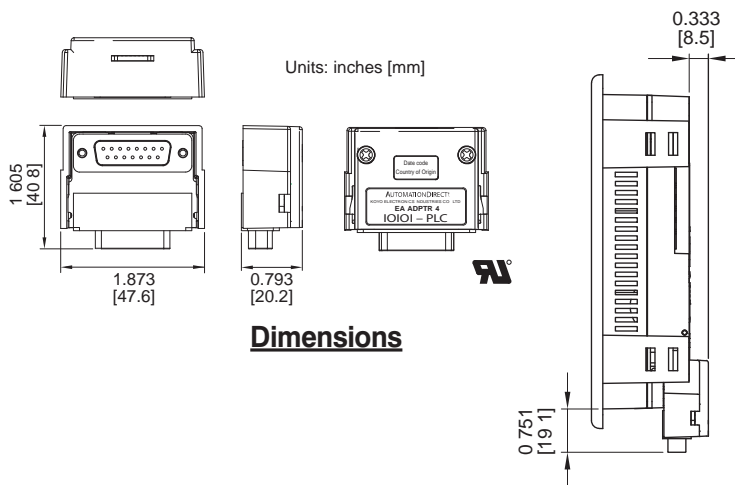


**NOTE:** Mounting clips for the panel and keypad bezels are included with the respective product.

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

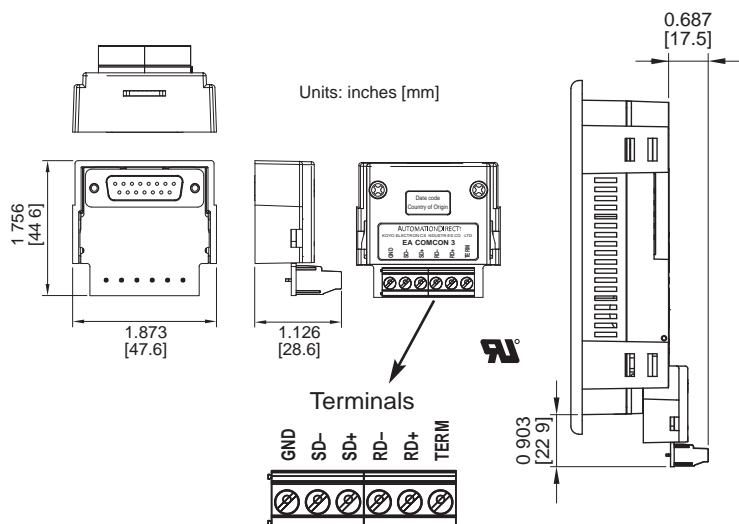
The EA-ADPTR-4 adapter plugs into the 15-pin serial port on the rear of the 6" panel to allow a PLC communication cable to be plugged in at a 90 degree angle to reduce panel depth requirements. 15-pin straight through pin-out. UL Recognized.

### EA-ADPTR-4



## 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 6" panel to allow wire terminal connections for an RS-422/RS-485/DH-485 PLC communication cable. UL Recognized.



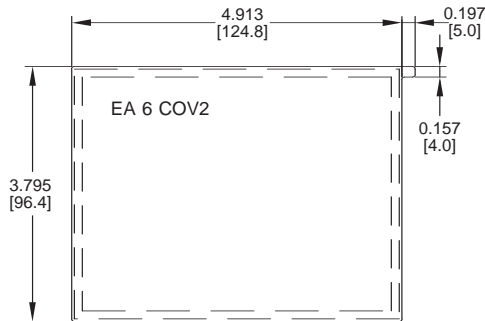
## Clear Screen Overlay

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 3



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

#### Step 2



Remove the paper backing from the overlay

#### 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

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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* 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

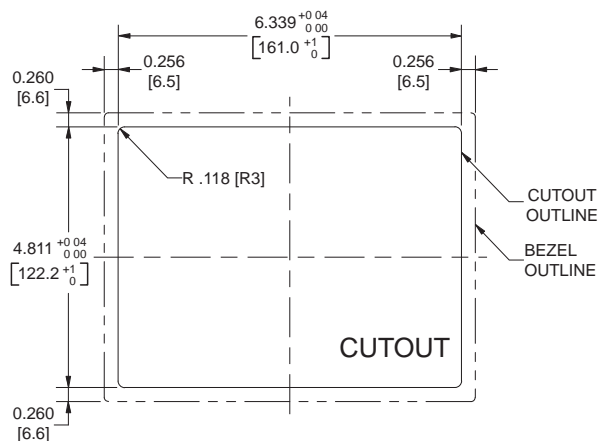


**NOTE:** The *C-more* 6" Micro-Graphic panel (EA1-S6ML & EA1-S6MLW), 20-Button Keypad Bezel (EA-MG6-BZ2) and 21-Button Keypad Bezel (EA-MG6-BZ2P) use the same type of mounting clip (EA-MG-BZ2-BRK).

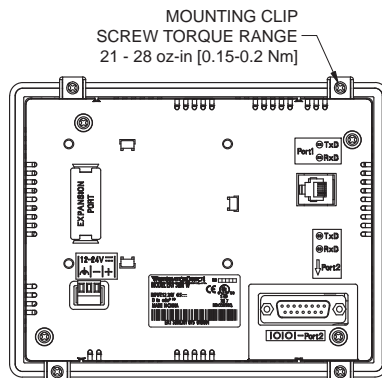
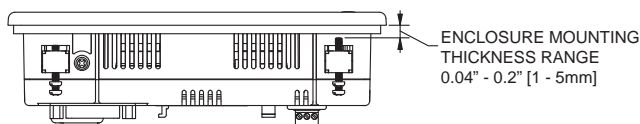


## Panel Cutout Dimensions (all models)

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.

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### Providing Power to the *C-more* 6" Micro-Graphic Panel

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

- 1.) The *C-more* 6" 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 6" 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* 6" 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.

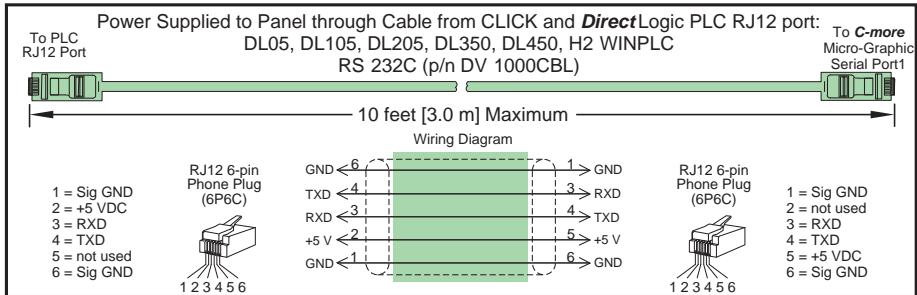


**NOTE:** When the 6" panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.

Wiring Guidelines continued at top of the next page.

## Wiring Guidelines (cont'd)

### Panel Powered from AutomationDirect PLC via Communications Cable



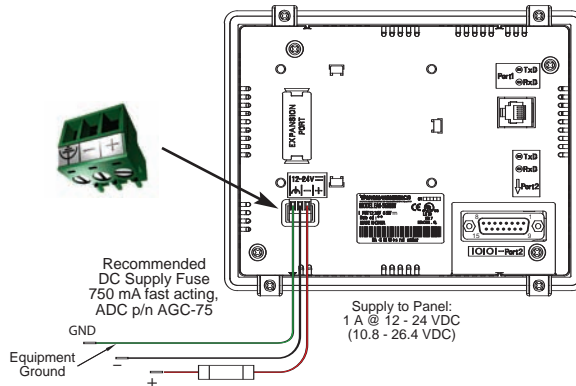
**NOTE:** Maximum cable length when the panel is powered via a PLC is 10 feet.

**NOTE:** Only one **C-more** Micro-Graphic panel can be powered by a **CLICK** PLC. If a 2nd panel is connected to a different port on the **CLICK** PLC, an external power supply is required.

Wiring Guidelines continued at top of the next page.

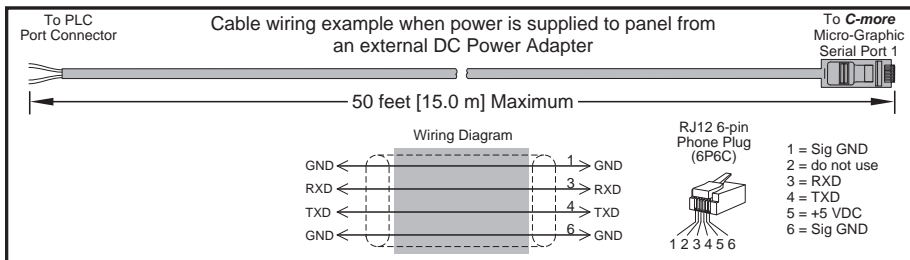
## Wiring Guidelines (cont'd)

### 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 6" 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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.



# 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.

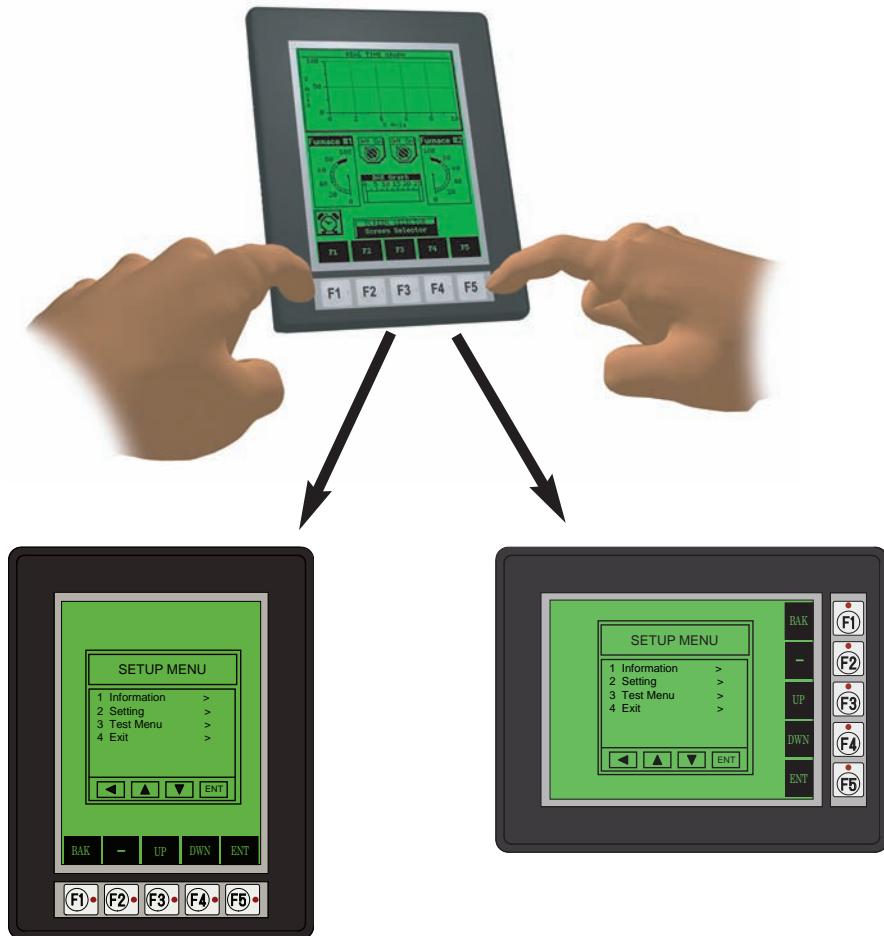
## Accessing the System Setup Screens

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.

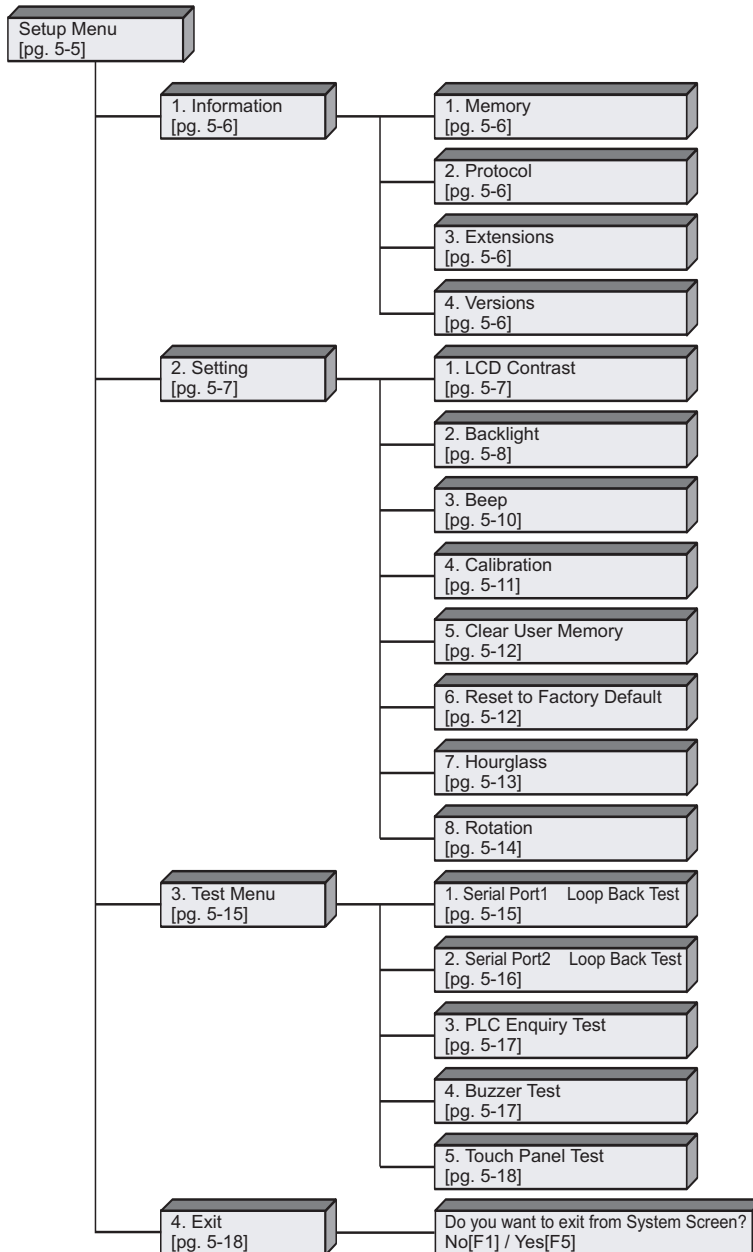
### C-more 6" Micro-Graphic Panel

5

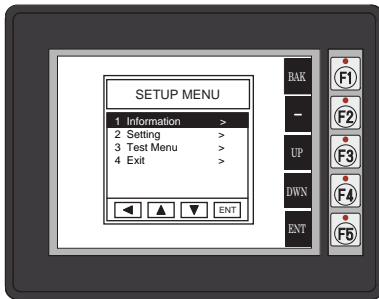




## System Setup Screens Flowchart

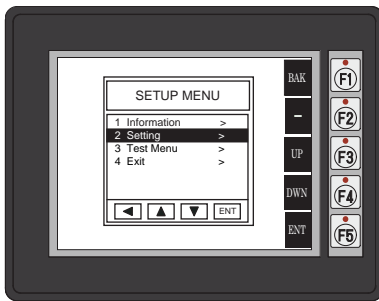


## Setup Menu

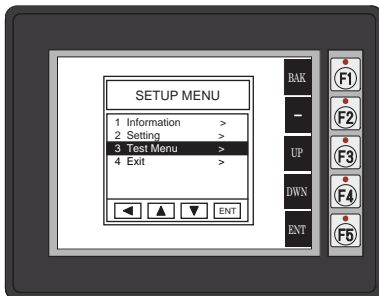


To navigate the different selections under the Setup Menu, use the function keys BAK [F1] to return to the project screen or previous screen, UP [F3] to cursor up, DWN [F4] to cursor down, and ENT [F5] to enter a selection.

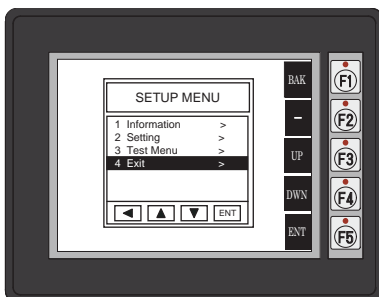
Pressing ENT [F5] with **Information** highlighted will take you to the **Information** menu screen. See page 5-6.



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

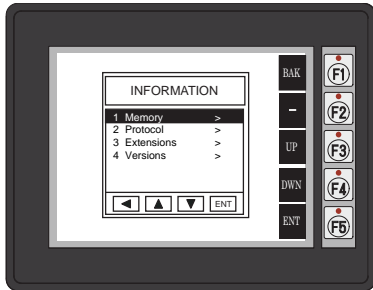


Pressing ENT [F5] with **Test Menu** highlighted will take you to the **Test Menu** screen. See page 5-15.

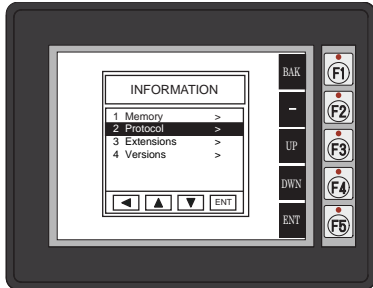
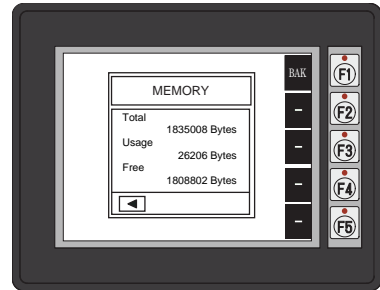


Pressing ENT [F5] with **Exit** highlighted will allow the user to decide whether to **Exit** or not **Exit** the System Setup Screens. See page 5-18.

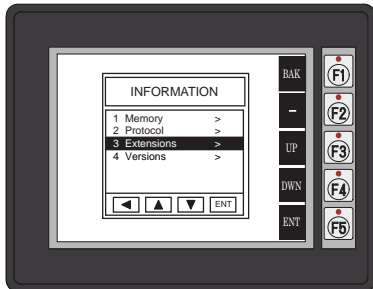
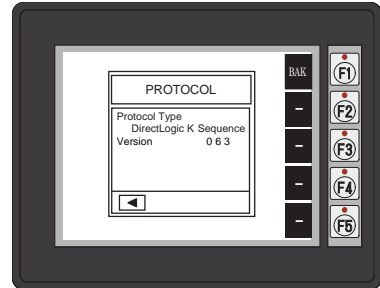
## Information Menu



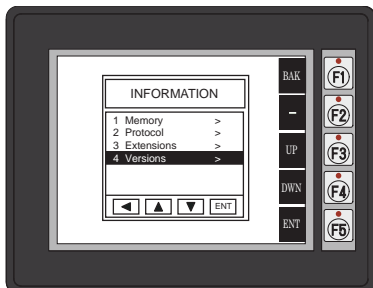
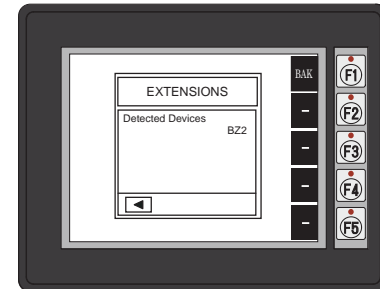
Pressing ENT [F5] with **Memory** highlighted will show the total memory available, memory usage and free memory available for the project.



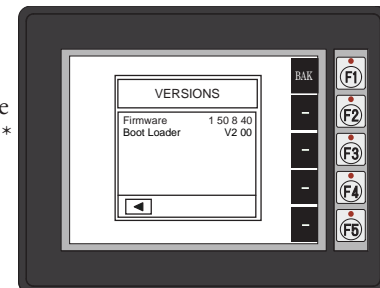
Pressing ENT [F5] with **Protocol** highlighted will show the PLC Protocol that has been assigned to the panel and the protocol version.



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.

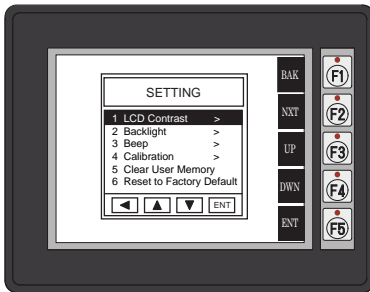


Pressing ENT [F5] with **Versions** highlighted will show the panel's firmware and boot loader versions.\*



**\*Note:** 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)

## 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

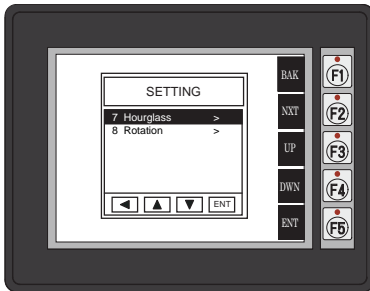
**Calibration** – page 5-11

**Clear User Memory** – page 5-12

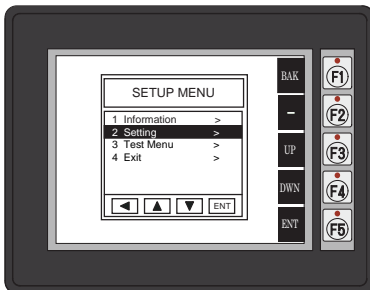
**Reset to Factory Default** – page 5-12

**Hourglass** – page 5-13

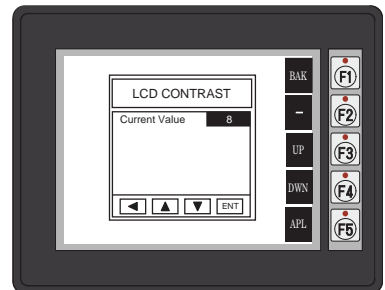
**Rotation** – page 5-14



## Setting – LCD Contrast

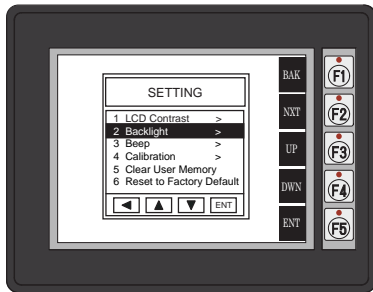


With **LCD Contrast** highlighted, press ENT [F5] to bring up the screen showing the current value. The default is 8. The contrast can be adjusted between 1 and 16, with 1 being the least contrast and 16 being the greatest.

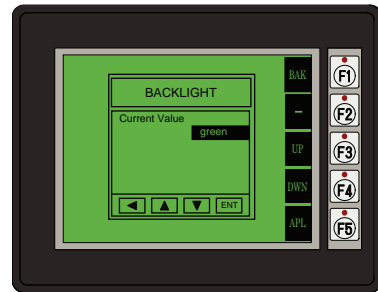


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection. **Low-Power Mode** is intended for initial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

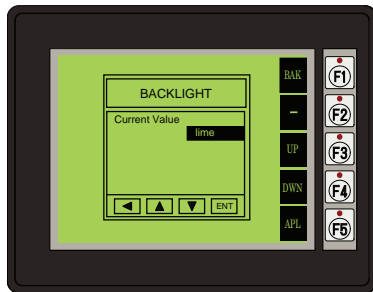
## Setting – Backlight, Model EA1-S6ML



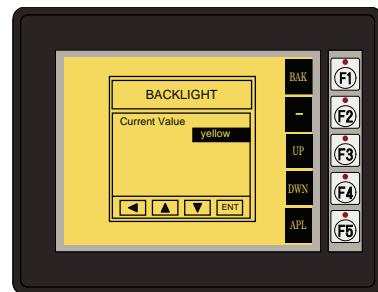
With Backlight highlighted, press ENT [F5] to show the current backlight screen color. For model EA1-S6ML, the default is green. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (green, lime, yellow, amber and red). Use the APL [F5] function key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



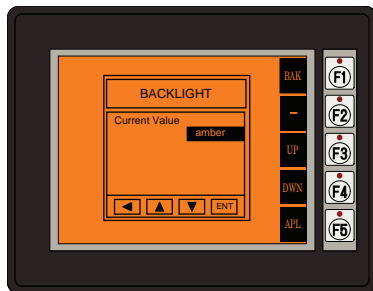
Green



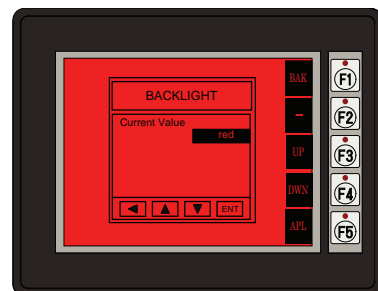
Lime



Yellow



Amber

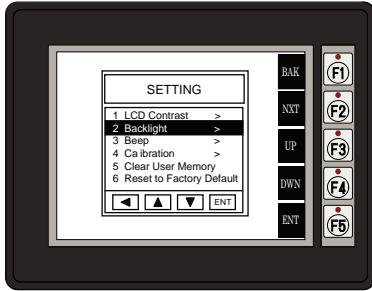


Red

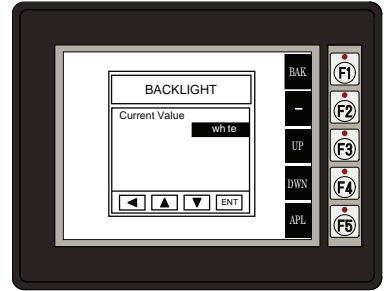


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

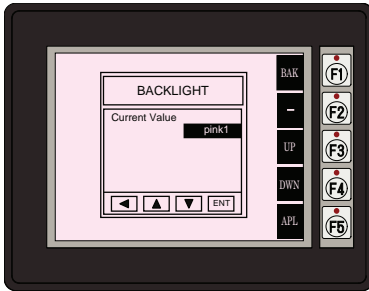
## Setting – Backlight, Model EA1-S6MLW



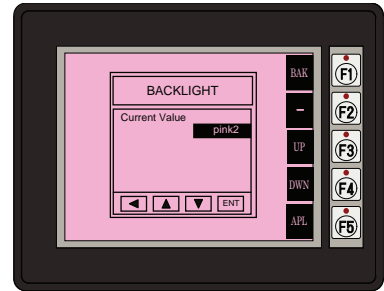
With Backlight highlighted, press ENT [F5] to show the current backlight screen color. For model EA1-S6MLW, the default is white. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (white, pink1, pink2, pink3 and red). Use the APL [F5] function key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



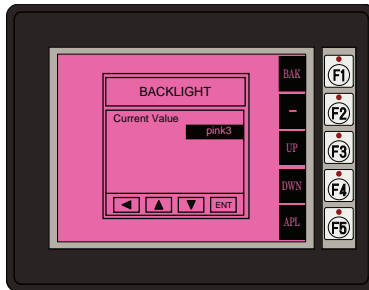
White



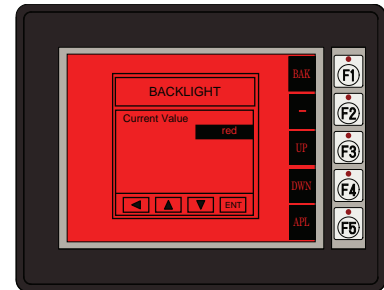
Pink1



Pink2



Pink3

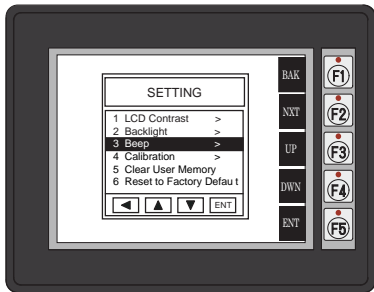


Red

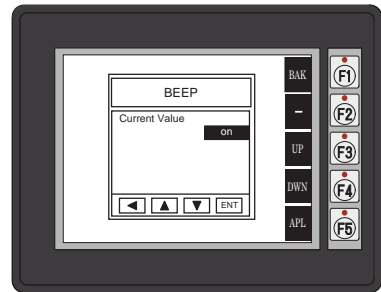


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

### Setting – Beep



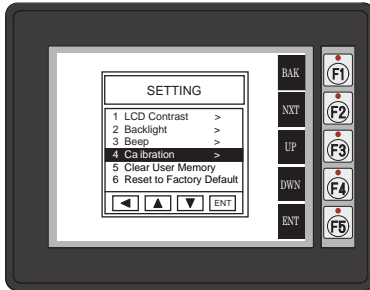
With Beep highlighted, press ENT [F5] to show the current value for the internal beeper. The default is ON. The UP [F3] and DWN [F4] function keys can be used to toggle between the ON and OFF state for the beeper (enable or disable). Use the APL [F5] function key to apply the selection.



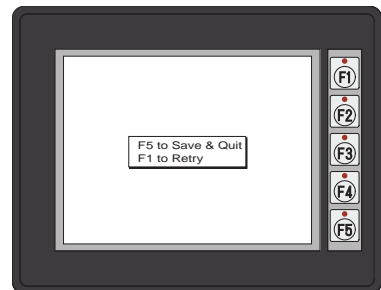
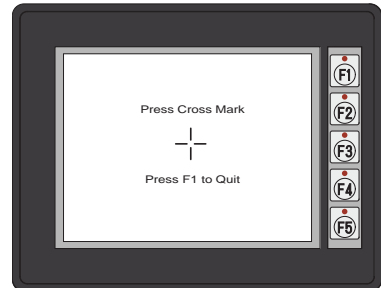
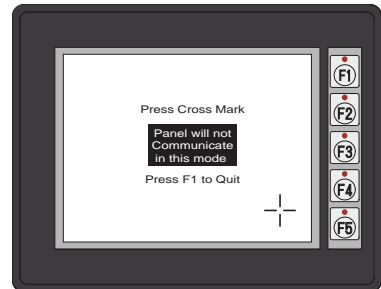
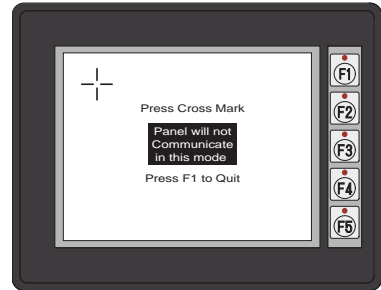
**Note:** Loading a project to the panel will override whatever selection is chosen for the beeper from the System Setup Screens' Beep on/off selection screen. The Beep on/off choice can be changed through the System Setup Screens **after** a project is loaded.

**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

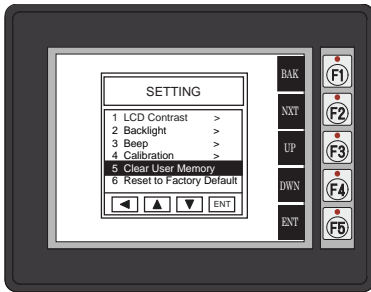


With **Calibration** highlighted, press ENT [F5] to bring up the first calibration screen as shown on the right. Touch the “cross” in the upper left corner as accurately as you can. When the screen is touched, the cross will move to each corner and finally to the center of the screen. If the touch points 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.

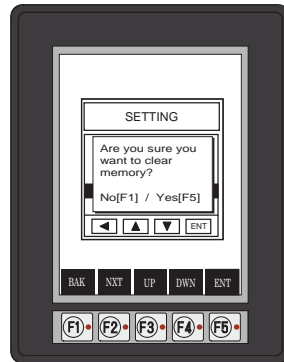
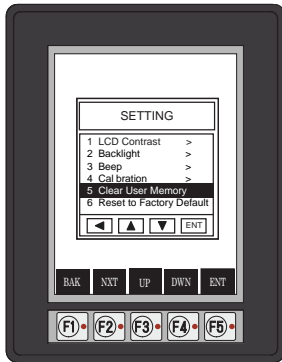
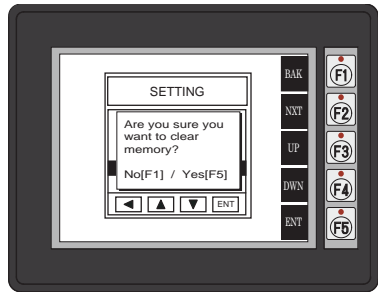




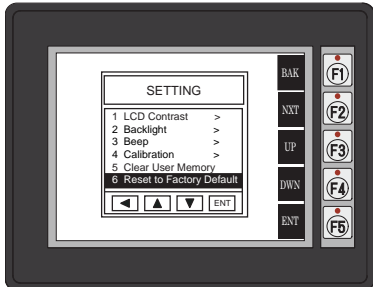
## Setting – Clear User Memory



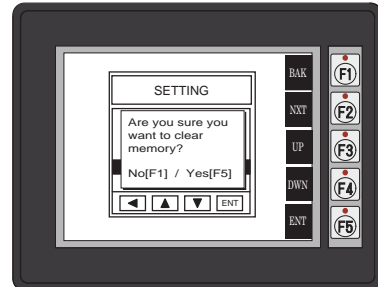
With Clear User Memory highlighted, press ENT [F5]. You will be given the choice to either proceed with clearing the user memory by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO.



## 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.



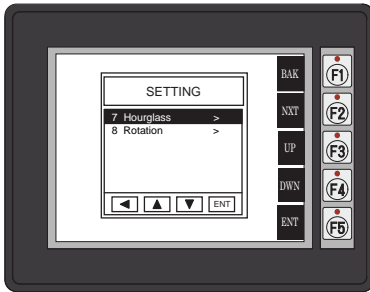
The Factory Default values are:

- 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.

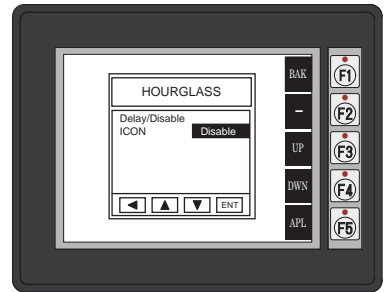
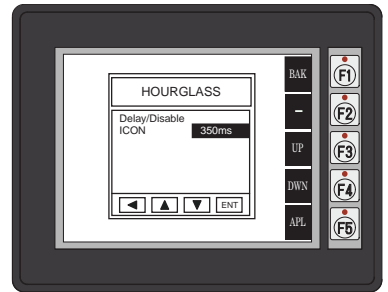
## Setting – Hourglass



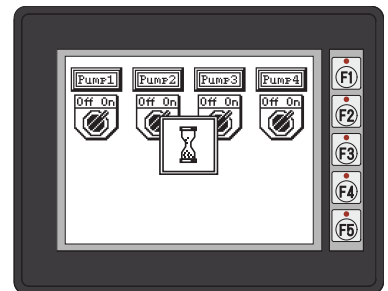
The **Hourglass** selection listed under the **Setting** menu can be used to either disable the display of the hourglass icon or set the amount of delay time (0 ms to 1000 ms) desired before it is displayed.

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.

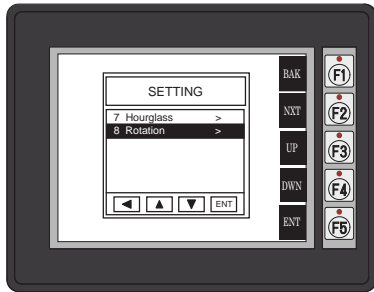
**Explanation:** An hourglass icon is displayed on the panel anytime a new screen is being loaded until communication is established with the new screen. If communication is established before the delay has timed out, no hourglass will be displayed. The hourglass icon can also be disabled from being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



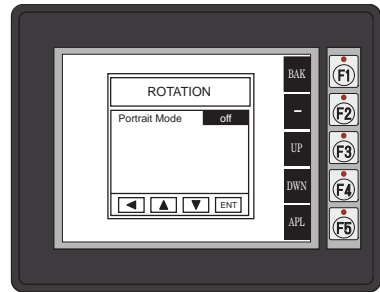
### Hourglass Icon



## Setting – Rotation

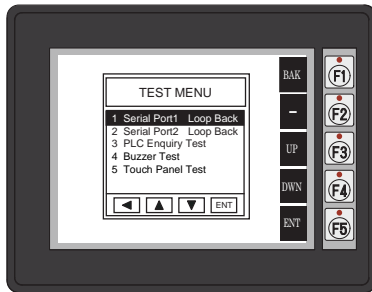


With **Rotation** highlighted, press ENT [F5] to show the current orientation. Press UP [F3] and DWN [F4] to toggle between the portrait (vertical) and landscape (horizontal) orientation. Use the APL [F5] function button to apply the selection.



**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

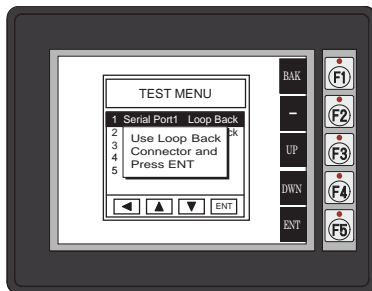
Serial Port2 - Loop Back Test – page 5-16

PLC Enquiry Test – page 5-17

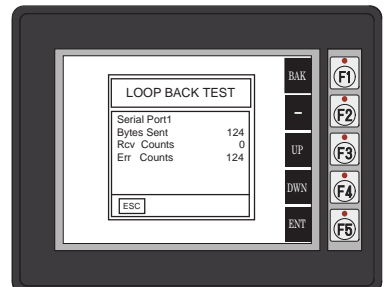
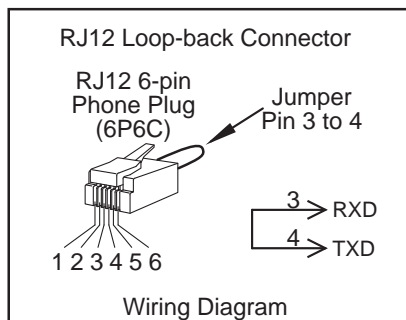
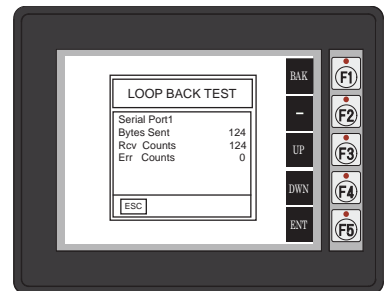
Buzzer Test – page 5-17

Touch Panel Test – page 5-18

## Test Menu – Serial Port1 - Loop Back Test

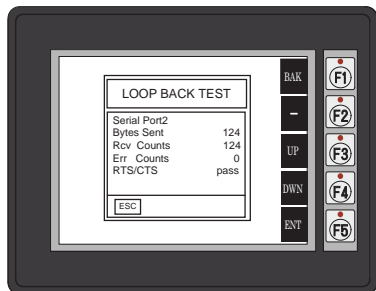


With Serial Port1 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the left. Connect a loop back connector constructed as shown here and press ENT [F5] to start the test. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not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

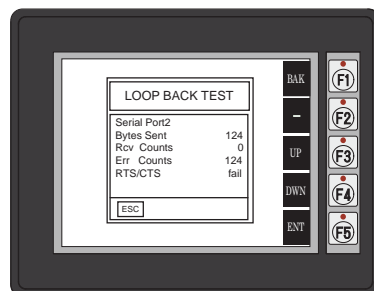
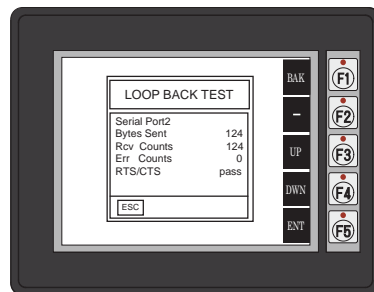
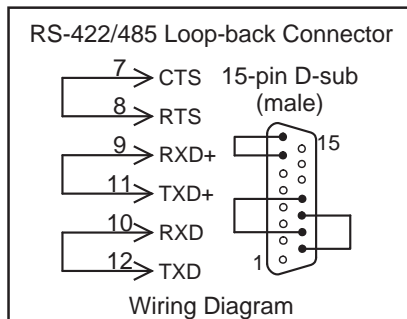
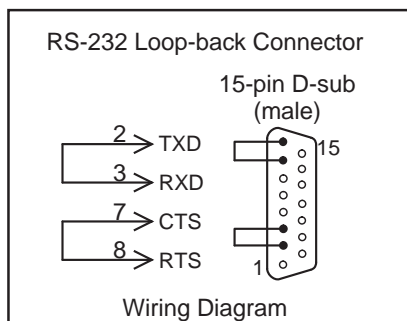
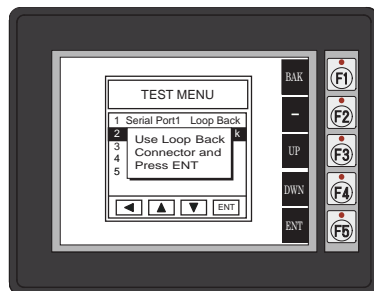


## Test Menu – Serial Port2 - Loop Back Test

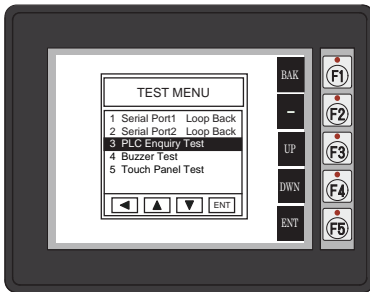
5



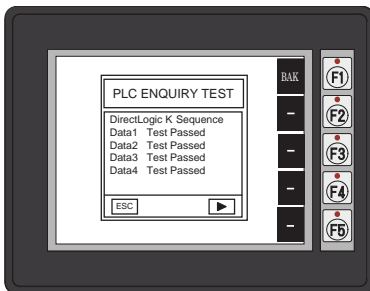
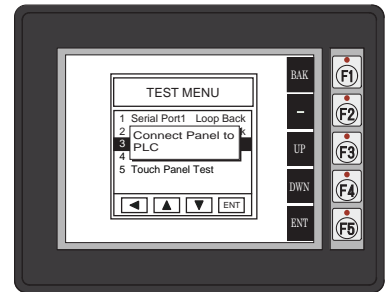
With Serial Port2 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the right. At this point, either connect the RS-232 loop back connector or the RS-422/485 loop back connector, depending on which type of communications connection is being used, and press ENT [F5] to start 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.



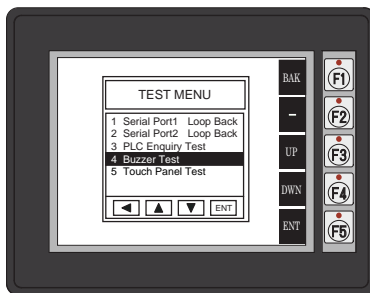
## Test Menu – PLC Enquiry Test



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.

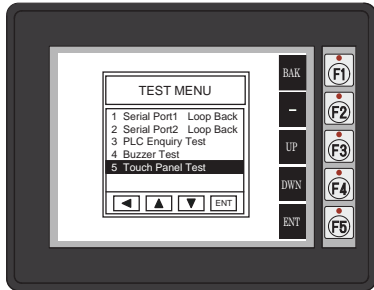


**Note:** The beeper tone is not selectable. The beeper function can not be turned on or off from this screen, refer to the Setting menu.

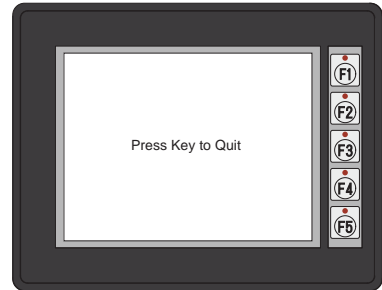


**Note:** When the panel is powered through Port1 from a connected PLC or PC, the beep will not function properly because the panel is running in **Low-Power Mode**. To use the beep signal, power the panel from an external 12-24 VDC power source.

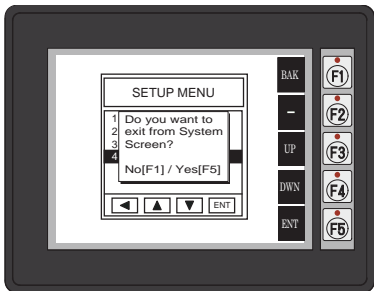
## Test Menu - Touch Panel Test



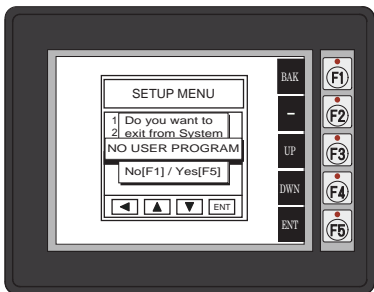
With Touch Panel Test highlighted, press ENT [F5] to bring up the screen shown to the right. Touch any area of the screen to visualize the active area of the touch screen. If the touch panel area is working properly, the screen will blacken at the area touched. Use this test to identify any area that 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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# CHAPTER 6

## In This Chapter...

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## Introduction

The *C-more*® 6" Micro-Graphic panels are capable of communicating with AutomationDirect CLICK and the entire *Direct*LOGIC 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 CLICK, DL05, DL06, DL105, DL205, D3-350 and DL405 CPUs using the following cables.

- DV-1000CBL – connects to CLICK, 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 CLICK, 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 Compatibility 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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.

## Introduction (cont'd)

### Available PLC Protocols

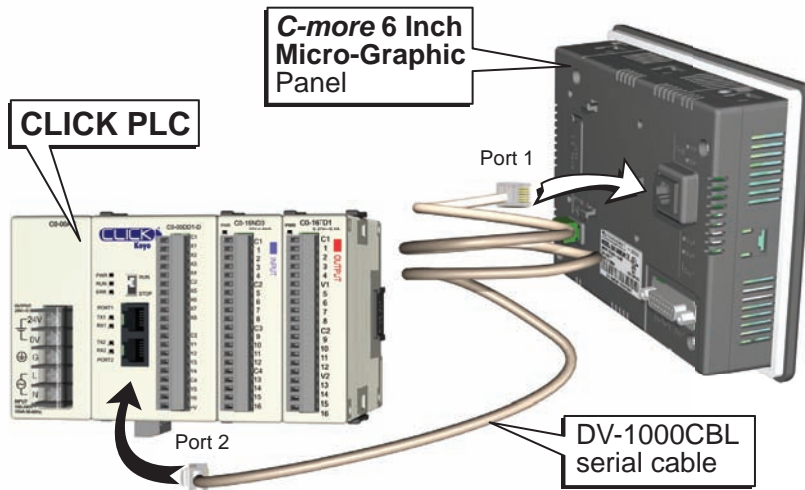
| PLC Drivers                    |  |
|--------------------------------|--|
| <i>Serial - port1 or port2</i> | <i>Serial - port2 only</i>                       |
| AutomationDirect CLICK         | Allen-Bradley DF1 Half Duplex                    |
| AutomationDirect K-sequence    | Allen-Bradley DF1 Full Duplex                    |
| AutomationDirect DirectNET     | Allen-Bradley PLC5 DF1                           |
| AutomationDirect Modbus        | Allen-Bradley DH485                              |
| Modicon Modbus RTU             | GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro) |
| Entivity Modbus RTU            | Mitsubishi FX                                    |
|                                | Mitsubishi Q & QnA                               |
|                                | 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.

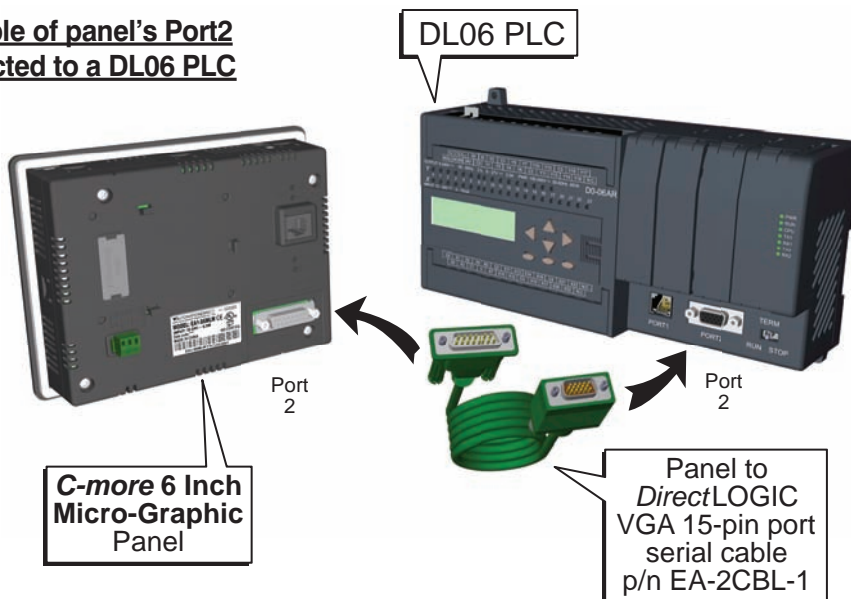
If you have difficulty determining whether the particular PLC and/or protocol you are using will work with *C-more* Micro-Graphic panels, please contact our technical support group at 770-844-4200.

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

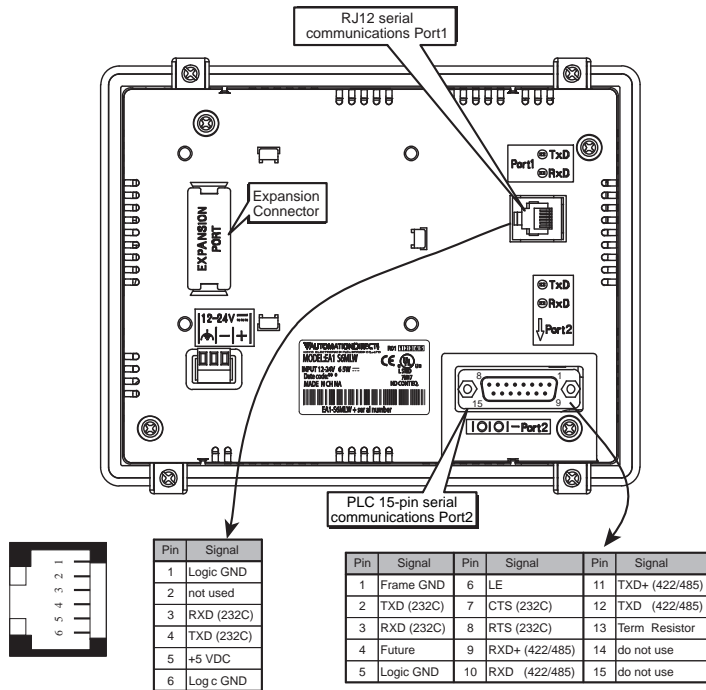
Example of panel's Port1  
connected to a CLICK PLC



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 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 6-26.

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.

### AutomationDirect CLICK PLC:

AutomationDirect's practically free PLC, CLICK, can be used with RS-232 2-wire networks. **C-more** Micro-Graphic panels are an ideal partner for CLICK which:

- Is low cost
- Is easy to use
- Uses standard Modbus communication
- Is programmed by free CLICK programming software
- Has com ports that provide 5 VDC
- The maximum communication speed between a CLICK PLC and a **C-more** Micro-Graphic panel is 38.4 Kbps.



**Note:** *Only one **C-more** Micro-Graphic panel can be powered by an AutomationDirect PLC. If connecting **C-more** Micro-Graphic panels to more than one port on an AutomationDirect PLC, the additional panel must use an external power supply.*

## 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                 |  |
| CLICK                                | all versions | Port 1 RJ12 - 6 pin    | AutomationDirect<br>Modbus (CLICK)  | DV-1000CBL*<br>RS-232              | AutomationDirect<br>Modbus (CLICK)      | EA-2CBL<br>RS-232                         |  |
| DirectLOGIC<br>DL05                  | all versions | Port 1 RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL*<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU | EA-2CBL<br>RS-232                         |  |
|                                      |              | Port 2 RJ12 - 6 pin    |   |                                    |   |   |  |
|                                      | DO-DCM       | Port 1 RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL*<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU | EA-2CBL<br>RS-232                         |  |
|                                      |              | Port 2 DB15HD (female) |   |                                    |   | EA-2CBL-1<br>RS-232                       |  |
|                                      |              | 4                      |   | DV-1000CBL*<br>+ FA-15HD<br>RS-232 | Modbus RTU                              | ** See Diagram 1<br>RS-422                |  |
|                                      |              |                        |   |                                    |   | ** See Diagram 2<br>RS-485<br>Modbus only |  |

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

PLC Compatibility &amp; 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<br>or<br>External DC Power Supply                                 |                              | External DC Power Supply                        |  |
|                              |              |                              | Using panel's RJ12 Port1  |                              | Using panel's Port2<br>DB 15-pin - female       |  |
|                              |              |                              | Protocol(s)<br>Supported  | Components &<br>Network Type | Protocol(s)<br>Supported                        | Components &<br>Network Type                             |
| <b>CLICK</b>                 | all versions | Port 1<br>RJ12 - 6 pin       | AutomationDirect<br>Modbus (CLICK)  | <b>DV-1000CBL*</b><br>RS-232 | AutomationDirect<br>Modbus (CLICK)              | <b>EA-2CBL</b><br>RS-232                                 |
| <b>DirectLOGIC<br/>DL05</b>  | all versions | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU                                     | <b>DV-1000CBL*</b><br>RS-232 | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              | Port 2<br>RJ12 - 6 pin       |   |                              |   |  |
|                              | D0-DCM       | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU                                     | <b>DV-1000CBL*</b><br>RS-232 | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              | Port 2<br>DB15HD<br>(female) |   |                              |   | <b>EA-2CBL-1</b><br>RS-232<br>** See Diagram 1<br>RS-422 |
| <b>Direct<br/>LOGICDL06</b>  | all versions | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU                                     | <b>DV-1000CBL*</b><br>RS-232 | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              | Port 2<br>DB15HD<br>(female) |   |                              |   | <b>EA-2CBL-1</b><br>RS-232<br>** See Diagram 1<br>RS-422 |
|                              | D0-DCM       | Port 1<br>RJ12 - 6 pin       | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU                                     | <b>DV-1000CBL*</b><br>RS-232 | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              |                              |   |                              |   | <b>EA-2CBL-1</b><br>RS-232<br>** See Diagram 1<br>RS-422 |
|                              |              | Port 2<br>DB15HD<br>(female) | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU                                     | <b>DV-1000CBL*</b><br>RS-232 | K-sequence,<br><b>DirectNET</b> ,<br>Modbus RTU | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              |                              |   |                              |   | <b>EA-2CBL-1</b><br>RS-232<br>** See Diagram 1<br>RS-422 |
| <b>DirectLOGIC<br/>DL105</b> | all versions | Port 1<br>RJ12 - 6 pin       | K-sequence  | <b>DV-1000CBL*</b><br>RS-232 | K-sequence                                      | <b>EA-2CBL</b><br>RS-232                                 |
|                              |              | Port 2<br>DB15HD<br>(female) |   |                              |   |  |

\* 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 &amp; 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<br>or<br>External DC Power Supply                                 |                                    | External DC Power Supply                  |   |  |
|                      |  |                                 | Using panel's RJ12 Port1  |                                    | Using panel's Port2<br>DB 15-pin - female |   |  |
|                      |  |                                 | Protocol(s)<br>Supported  | Components &<br>Network Type       | Protocol(s)<br>Supported                  | Components &<br>Network Type                          |  |
| DirectLOGIC<br>DL205 | D2-230   | Port 1<br>RJ12 - 6 pin          | K-sequence  | DV-1000CBL*<br>RS-232              | K-sequence                                | EA-2CBL<br>RS-232                                     |  |
|                      | D2-240   | Port 1<br>RJ12 - 6 pin          | K-sequence  | DV-1000CBL*<br>RS-232              | K-sequence                                | EA-2CBL<br>RS-232                                     |  |
|                      |  | Port 2<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET  |                                    | K-sequence,<br>DirectNET                  |   |  |
|                      | D2-250-1   | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL*<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-2CBL<br>RS-232                                     |  |
|                      |  | Port 2<br>DB15HD<br>(female)    |   | DV-1000CBL*<br>+ FA-15HD<br>RS-232 |   | EA-2CBL-1<br>RS-232<br><br>** See Diagram 1<br>RS-422 |  |
|                      | D2-260   | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL*<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-2CBL<br>RS-232                                     |  |
|                      |  | Port 2<br>DB15HD<br>(female)    |   | DV-1000CBL*<br>+ FA-15HD<br>RS-232 |   | EA-2CBL-1<br>RS-232<br><br>** See Diagram 1<br>RS-422 |  |
|                      |  |                                 |   |                                    | Modbus RTU                                | ** See Diagram 2<br>RS-485<br>Modbus only             |  |
|                      | D2-DCM   | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET,<br>Modbus RTU   | ** See Diagram 3<br>RS-232         | DirectNET                                 | EA-4CBL-2<br>RS-232<br><br>** See Diagram 6<br>RS-422 |  |
|                      | WINPLC   | Port 1<br>RJ12 - 6 pin          | Modbus RTU  | DV-1000CBL*<br>RS-232              | Modbus RTU                                | EA-2CBL<br>RS-232                                     |  |
|                      | * 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 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<br>or<br>External DC Power Supply                                 |                              | External DC Power Supply                  |   |  |
|                                      |   |                                     | Using panel's RJ12 Port1  |                              | Using panel's Port2<br>DB 15-pin - female |   |  |
|                                      |   |                                     | Protocol(s)<br>Supported  | Components &<br>Network Type | Protocol(s)<br>Supported                  | Components &<br>Network Type                      |  |
| DirectLOGIC<br>DL305                 | D3-330 or<br>D3-340   | D3-232-DCU<br>DB 25 pin<br>(female) | DirectNET   | EA-4CBL-2<br>RS-232          | DirectNET                                 | EA-4CBL-2<br>RS-232                               |  |
|                                      |   | D3-422-DCU<br>DB 25 pin<br>(female) | Not Possible  |                              | DirectNET                                 | ** See Diagram 6<br>RS-422                        |  |
|                                      | D3-340  | Port 1<br>RJ11 - 4 pin              | DirectNET   | OP-3CBL-1<br>RS-232          | DirectNET                                 | EA-3CBL<br>RS-232                                 |  |
|                                      |   | Port 2<br>RJ11 - 4 pin              | DirectNET,<br>Modbus RTU  |                              | DirectNET,<br>Modbus RTU                  |   |  |
|                                      | D3-350  | Port 1<br>RJ12 - 6 pin              | K-sequence,<br>DirectNET  | DV-1000CBL*<br>RS-232        | K-sequence,<br>DirectNET                  | EA-2CBL<br>RS-232                                 |  |
|                                      |   | Port 2<br>DB 25 pin<br>(female)     | K-sequence,<br>DirectNET,<br>Modbus RTU   | ** See Diagram 3<br>RS-232   | K-sequence,<br>DirectNET,<br>Modbus RTU   | EA-4CBL-2<br>RS-232<br>** See Diagram 4<br>RS-422 |  |
|                                      | D3-DCM<br>D3-350 only   | Port 1<br>DB 25 pin<br>(female)     | K-sequence,<br>DirectNET,<br>Modbus RTU   | ** See Diagram 3<br>RS-232   | DirectNET                                 | EA-4CBL-2<br>RS-232<br>** See Diagram 6<br>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 &amp; 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, <i>DirectNET</i>  | DV-1000CBL* & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i>              | EA-4CBL-2 RS-232<br>** 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, <i>DirectNET</i>  | DV-1000CBL* & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i>              | EA-4CBL-2 RS-232<br>** 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, <i>DirectNET</i> , Modbus RTU   | DV-1000CBL* & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i> , Modbus RTU | EA-4CBL-2 RS-232<br>** See Diagram 4 RS-422 |
|                   |        | Port 3 DB 25 pin (female) | Not Possible  |  | K-sequence, <i>DirectNET</i> , Modbus RTU | ** See Diagram 5 RS-422                     |
|                   |        | Port 2 RJ12 - 6 pin       | K-sequence, <i>DirectNET</i>  | DV-1000CBL* RS-232                           | K-sequence, <i>DirectNET</i>              | EA-2CBL RS-232                              |
|                   | D4-DCM | Port 1 DB 25 pin (female) | K-sequence, <i>DirectNET</i> , Modbus RTU   | ** See Diagram 3 RS-232                      | <i>DirectNET</i>                          | 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 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.

## 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 &amp; 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            |
|            | Q / QnA  | 9-pin D-sub port         |   |                           | Q / QnA                                | ** See Diagram 14 RS-232C        |
|            |  | 6-pin mini-din port      |   |                           |  | ** See Diagram 15 RS-232C        |
| 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>  |                   |
| AutomationDirect CLICK, <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)<br><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>   |                        |
| AutomationDirect CLICK, <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



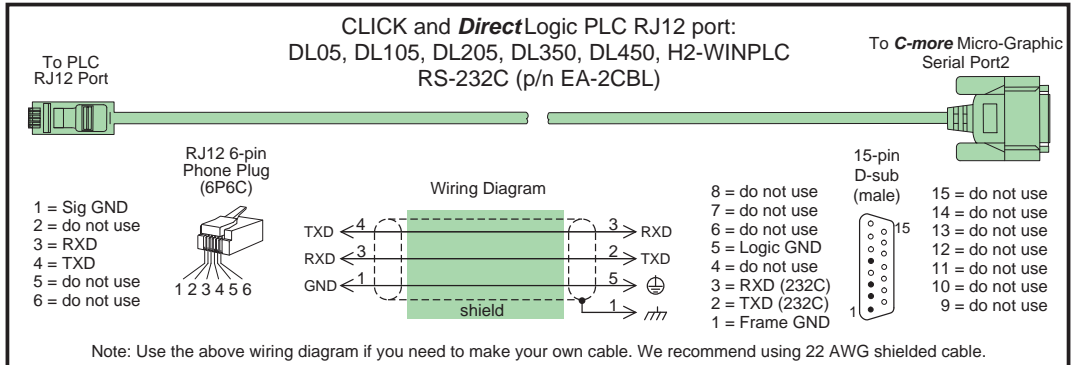
Part No. EA-OMRON-CBL

## 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.

### CLICK & *Direct*LOGIC:

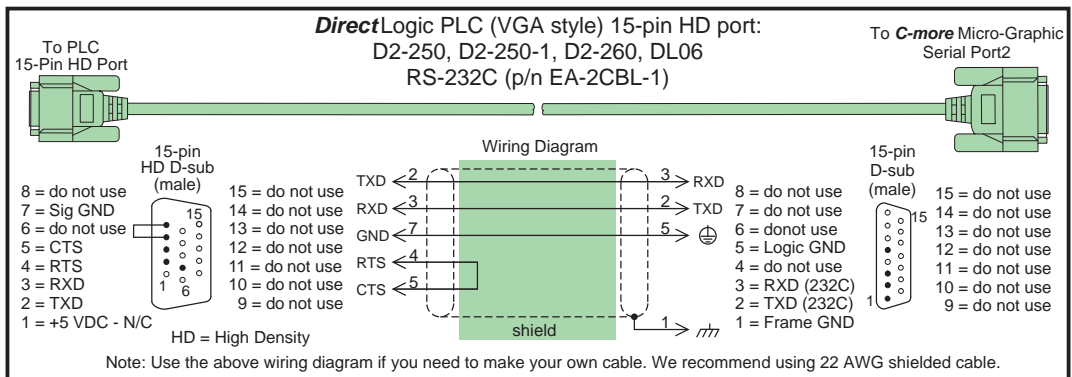
### EA-2CBL



**Note:** Only one *C-more* Micro-Graphic panel can be powered by an AutomationDirect PLC. If connecting *C-more* Micro-Graphic panels to more than one port on an AutomationDirect PLC, the additional panel must use an external power supply.

### *Direct*LOGIC:

### EA-2CBL-1

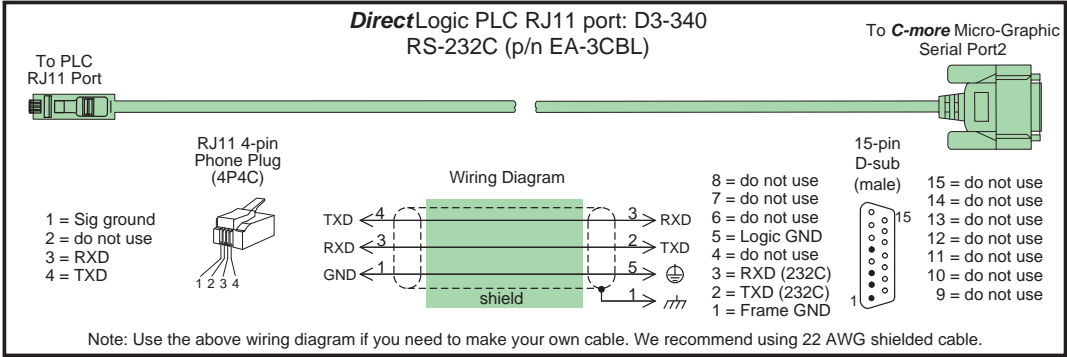




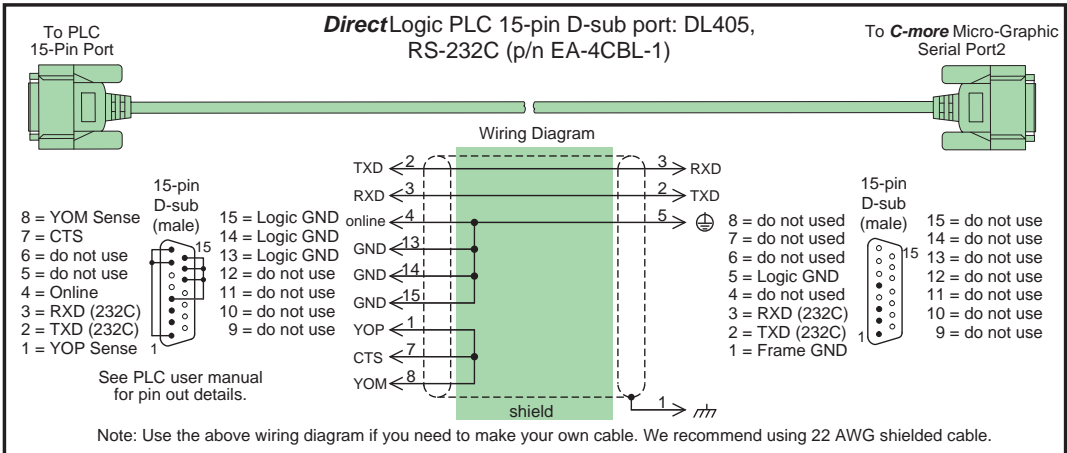
# Cables from AutomationDirect – Wiring Diagrams (cont'd)

## DirectLOGIC:

## EA-3CBL



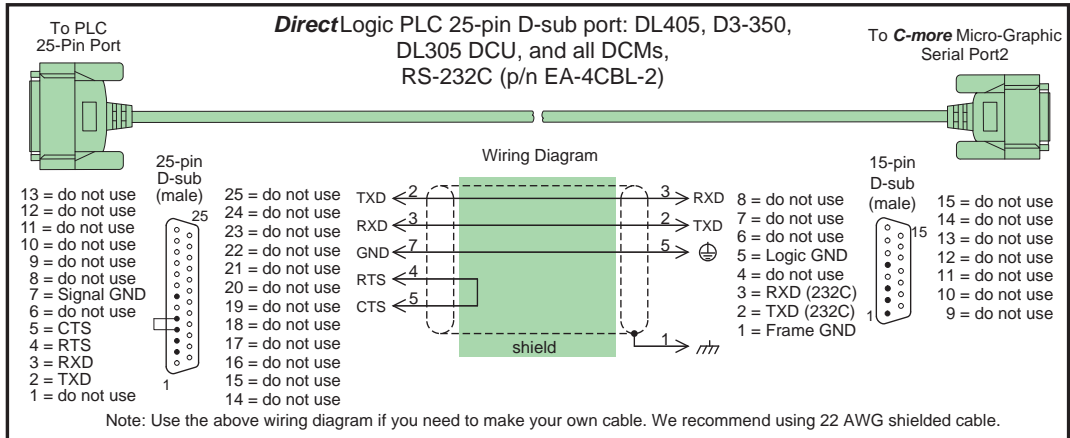
## EA-4CBL-1



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

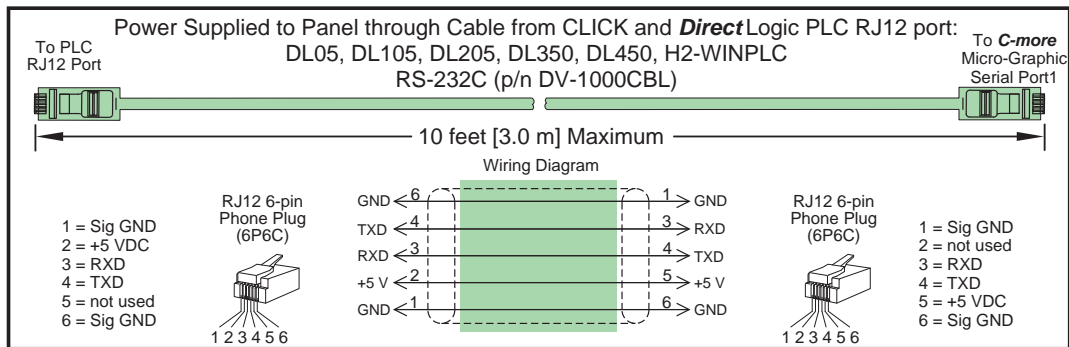
**Direct**LOGIC:

**EA-4CBL-2**



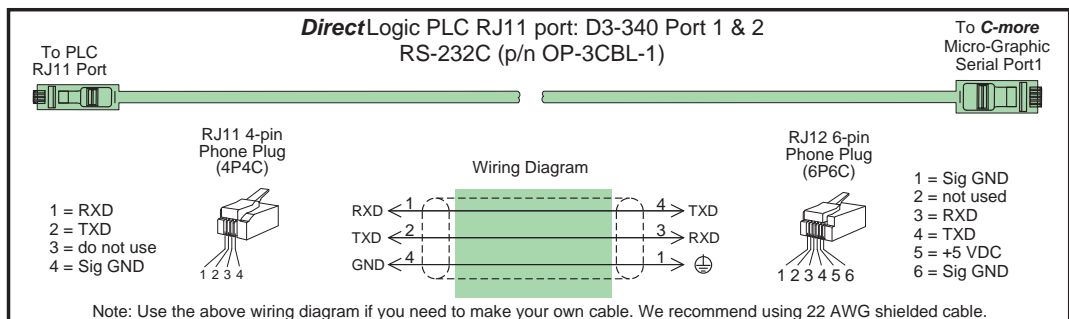
## Cables from AutomationDirect – Wiring Diagrams (cont'd)

### DV-1000CBL

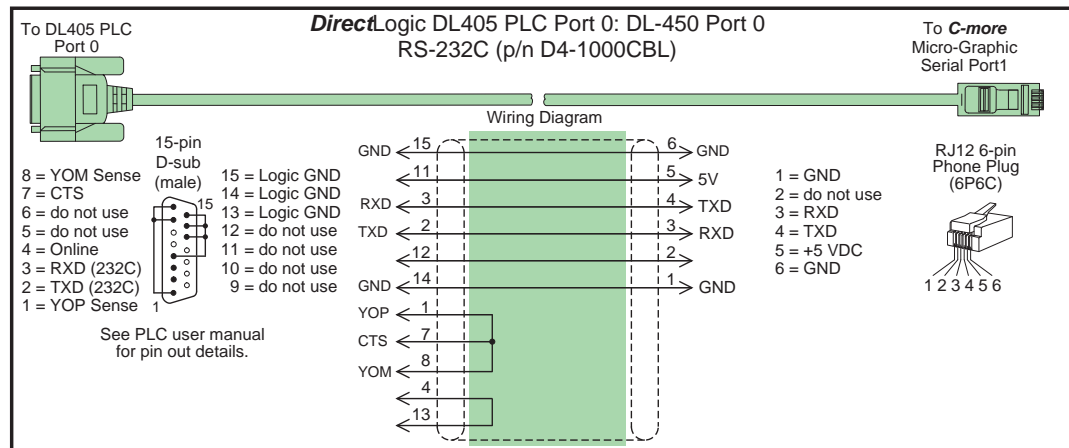


**Note:** Only one **C-more** Micro-Graphic panel can be powered by an AutomationDirect PLC. If connecting **C-more** Micro-Graphic panels to more than one port on an AutomationDirect PLC, the additional panel must use an external power supply.

### OP-3CBL-1



### D4-1000CBL



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

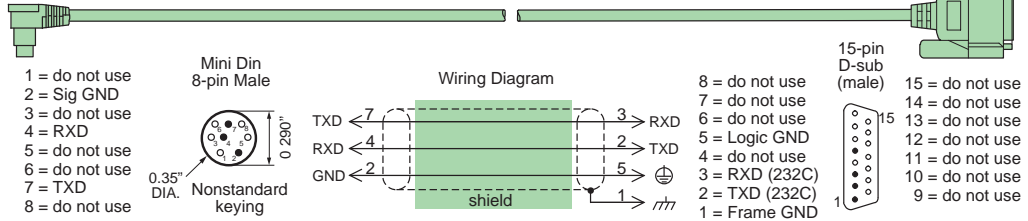
## Allen-Bradley:

## 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



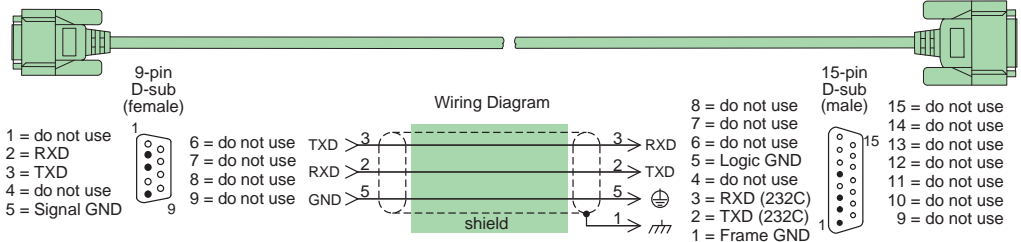
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

## 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  
Serial Port2



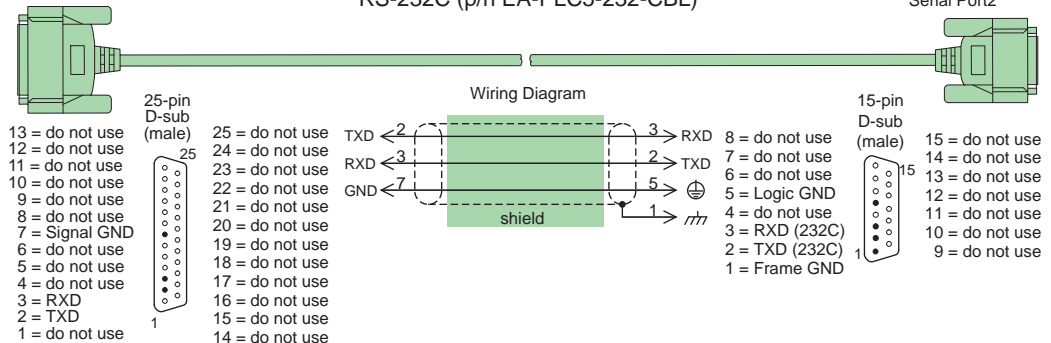
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

## 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  
Serial Port2

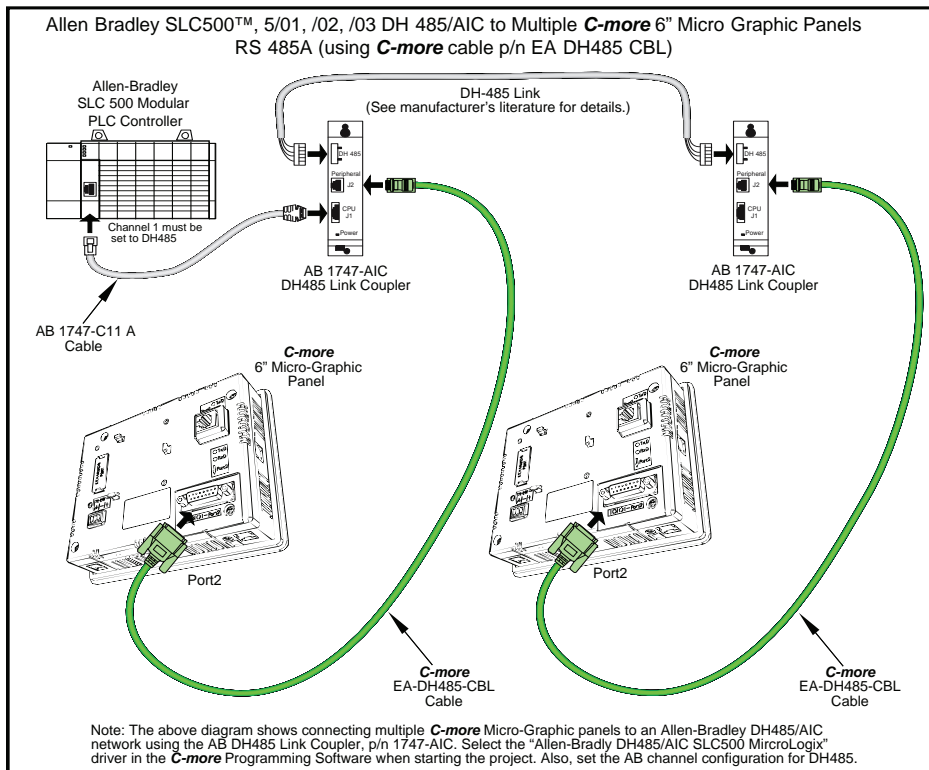
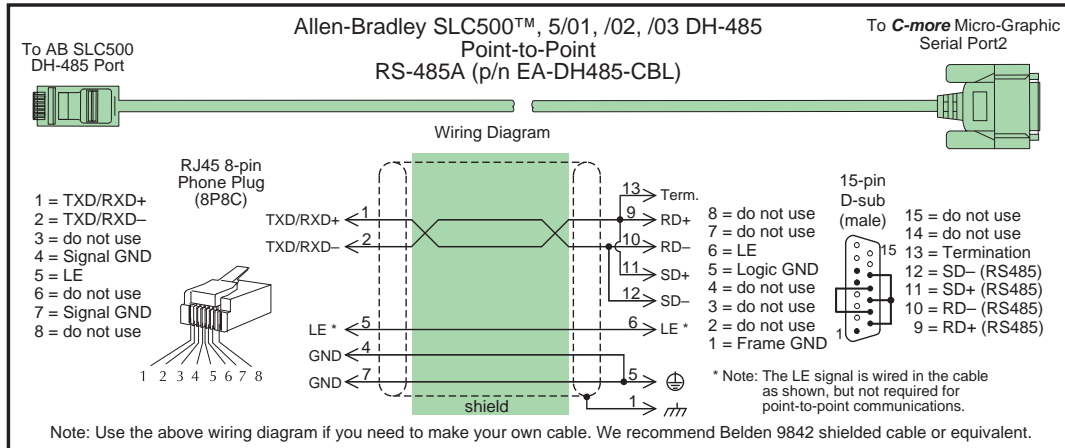


Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

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

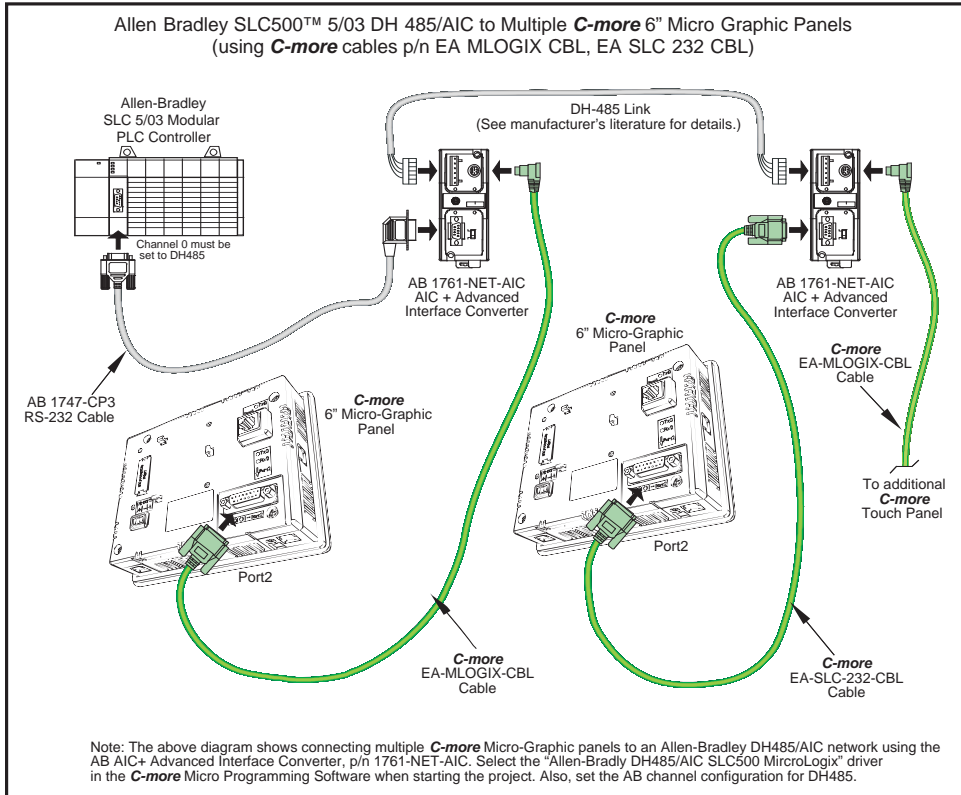
Allen-Bradley:

EA-DH485-CBL



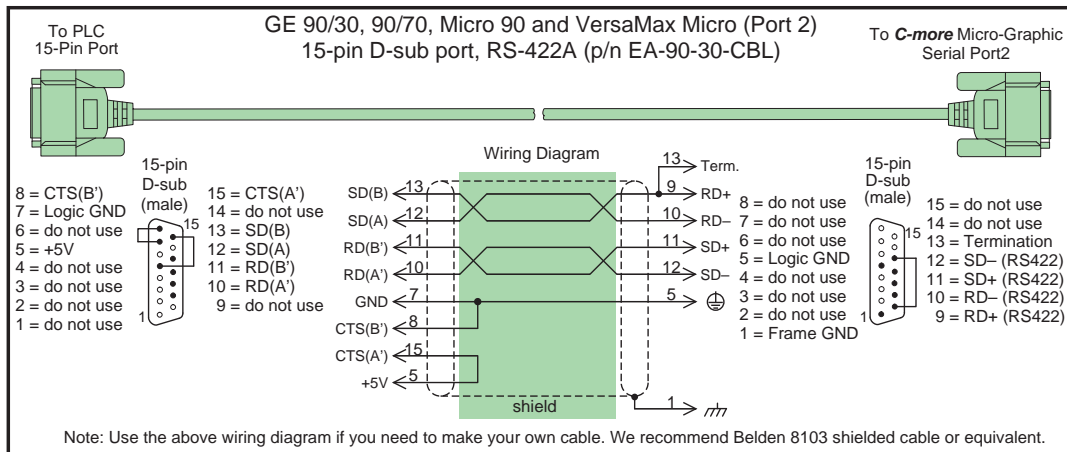
## Cables from AutomationDirect - Wiring Diagrams (cont'd)

### Allen-Bradley:

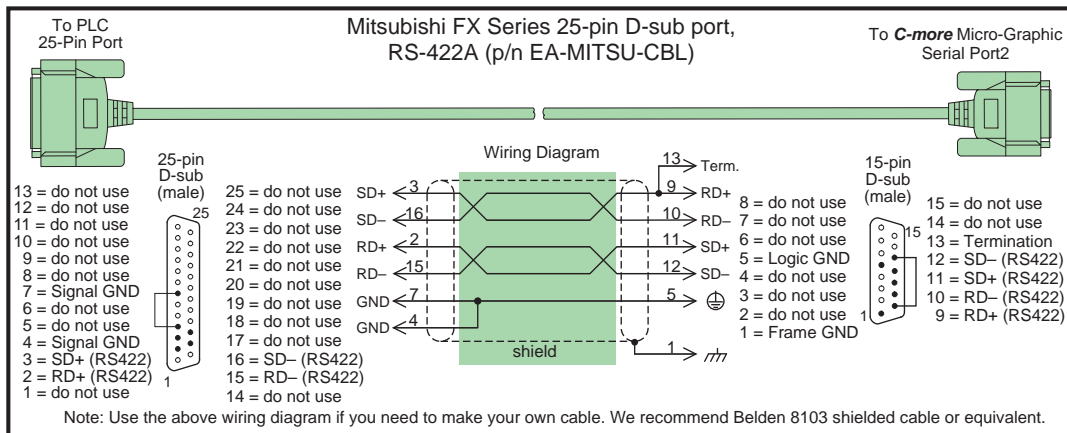


## Cables from AutomationDirect - Wiring Diagrams (cont'd)

GE:

**EA-90-30-CBL**

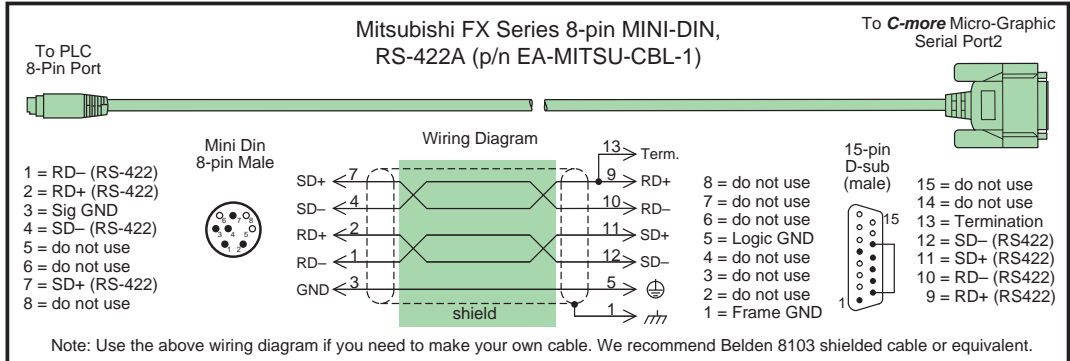
Mitsubishi:

**EA-MITSU-CBL**

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

Mitsubishi:

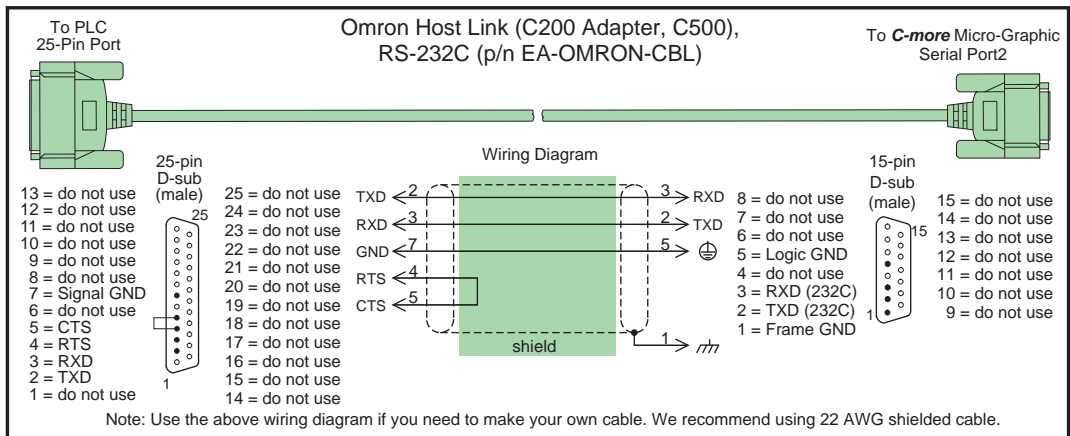
**EA-MITSU-CBL-1**



6

Omron:

**EA-OMRON-CBL**





# User Constructed Cables – Wiring Diagrams

Diagram 1

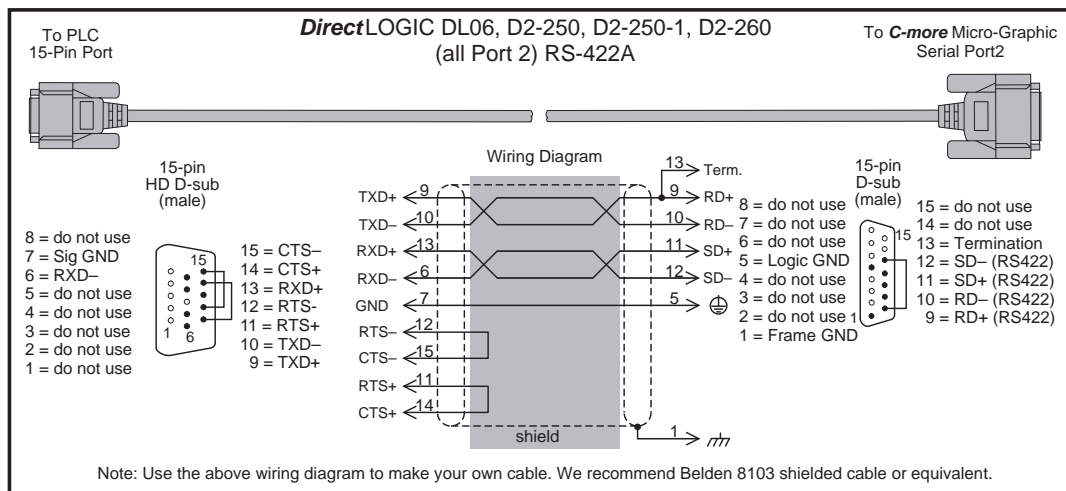
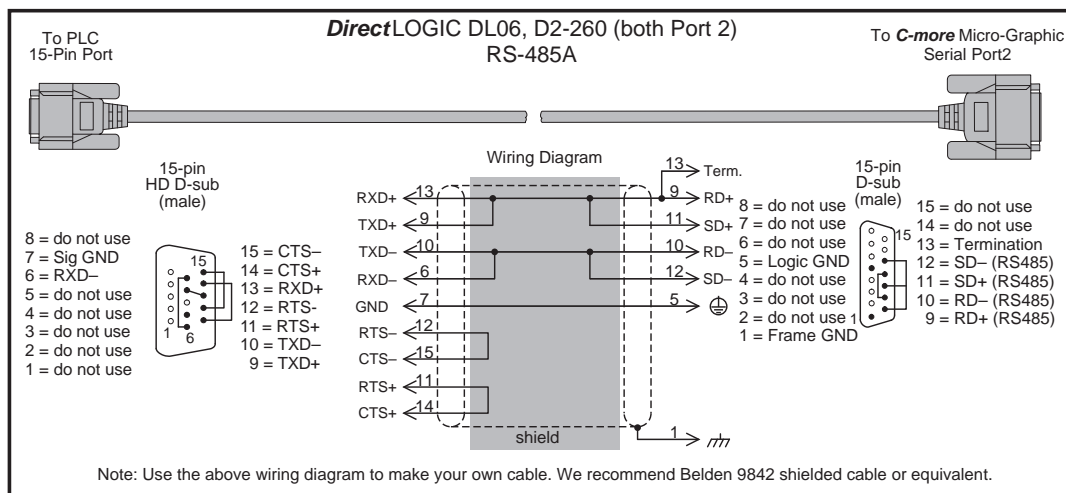
**User Constructed**

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

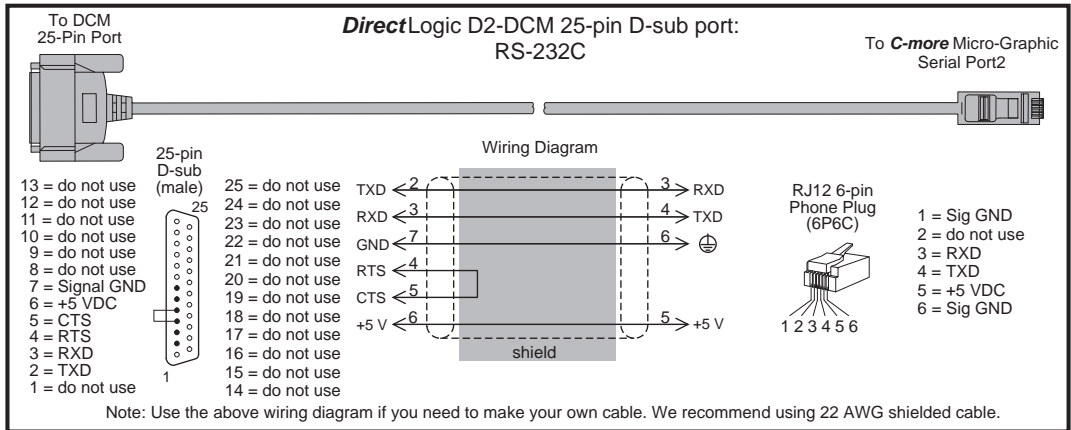
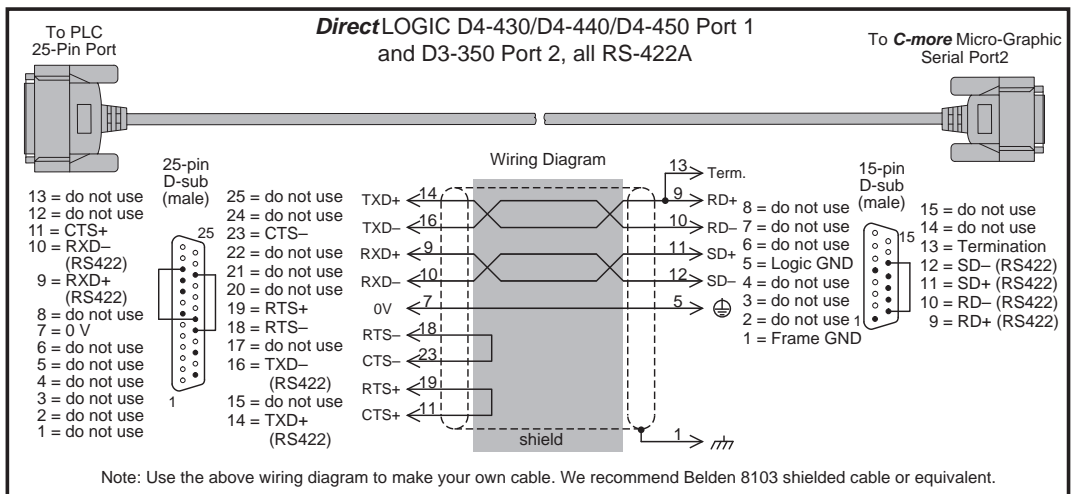


Diagram 4

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

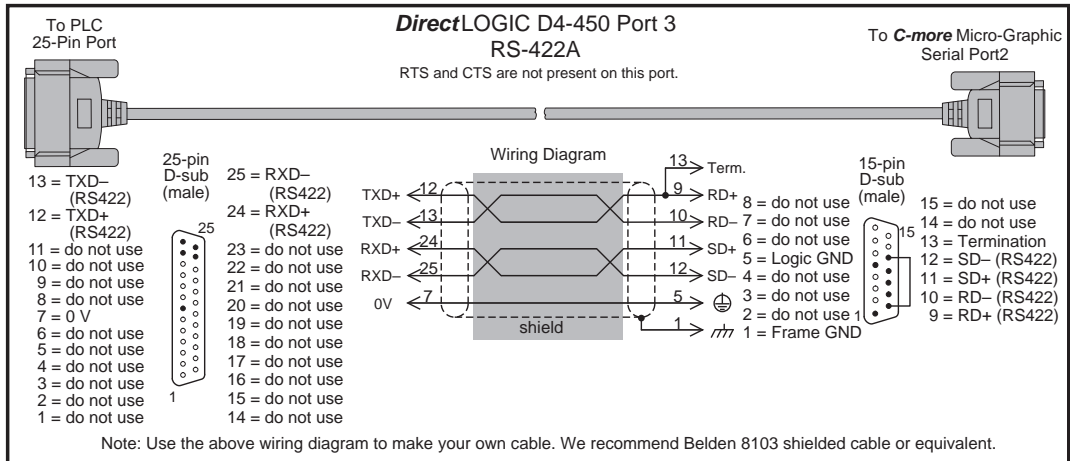
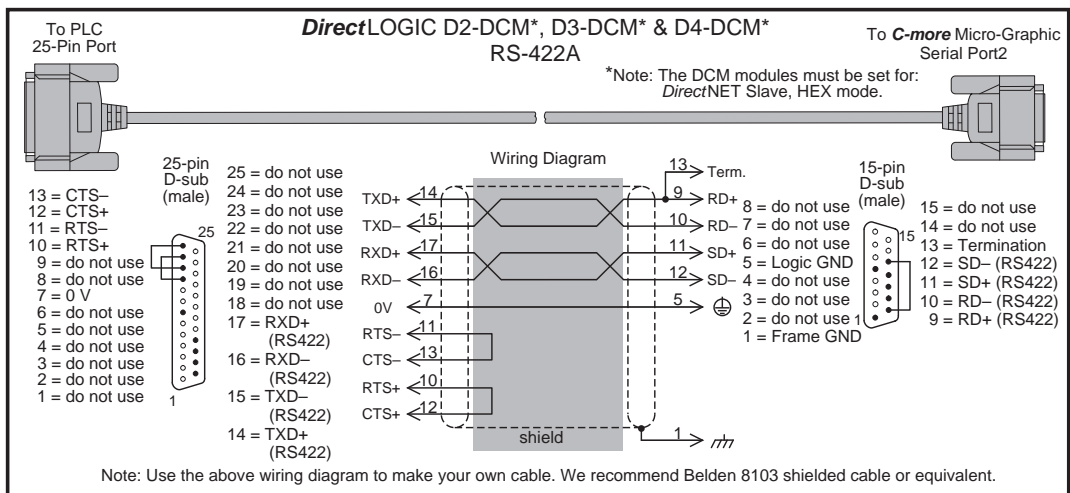


Diagram 6

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

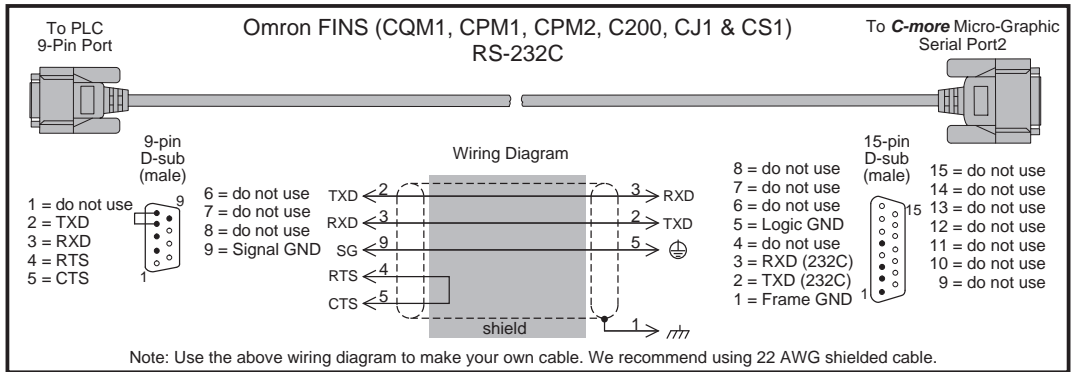
**User Constructed**

Diagram 8

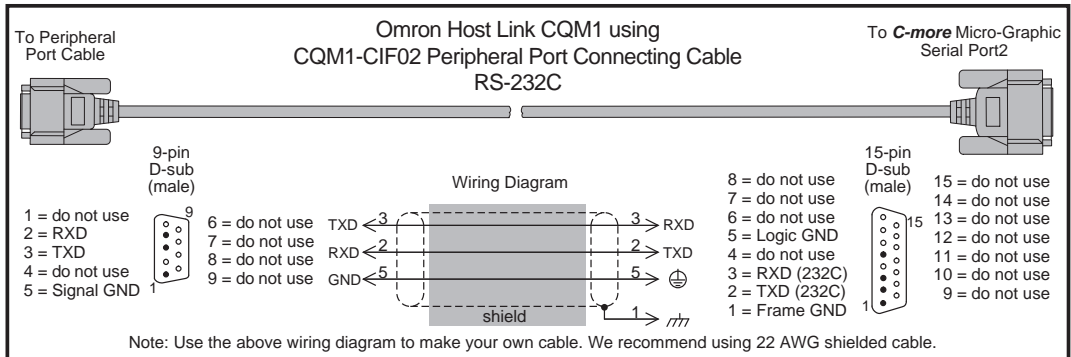
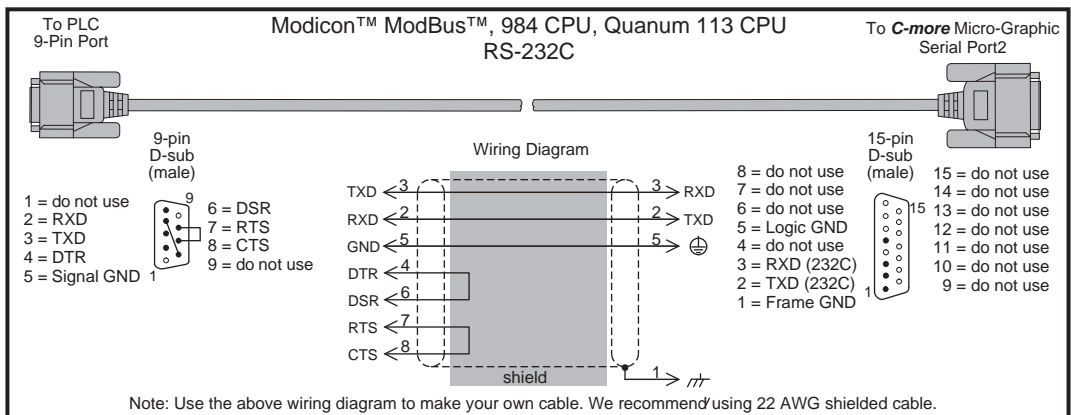
**User Constructed**

Diagram 9

**User Constructed**

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

Diagram 10

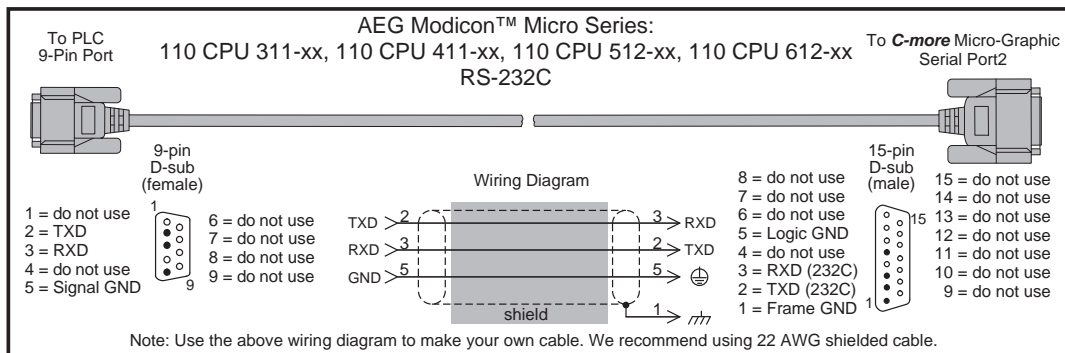
**User Constructed**

Diagram 11

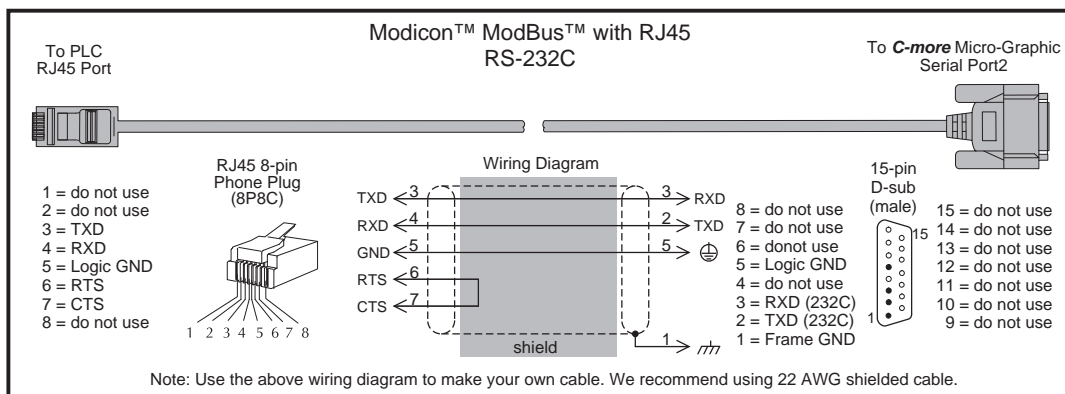
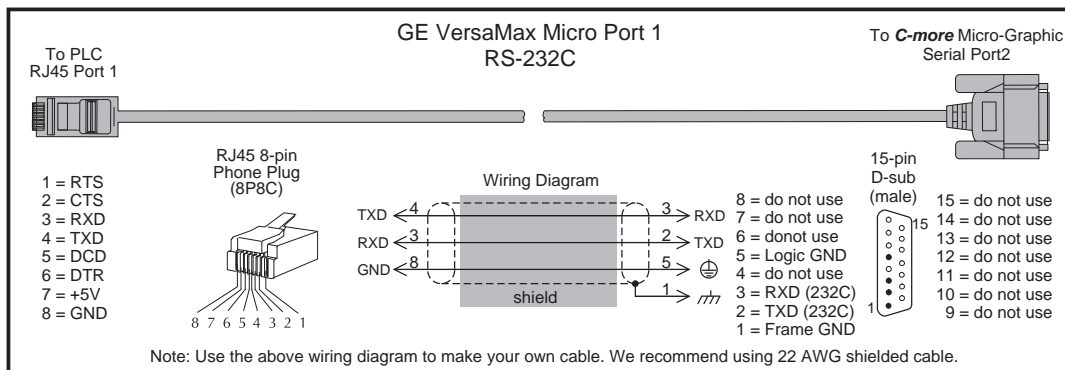
**User Constructed**

Diagram 12

**User Constructed**

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

Diagram 13

User Constructed

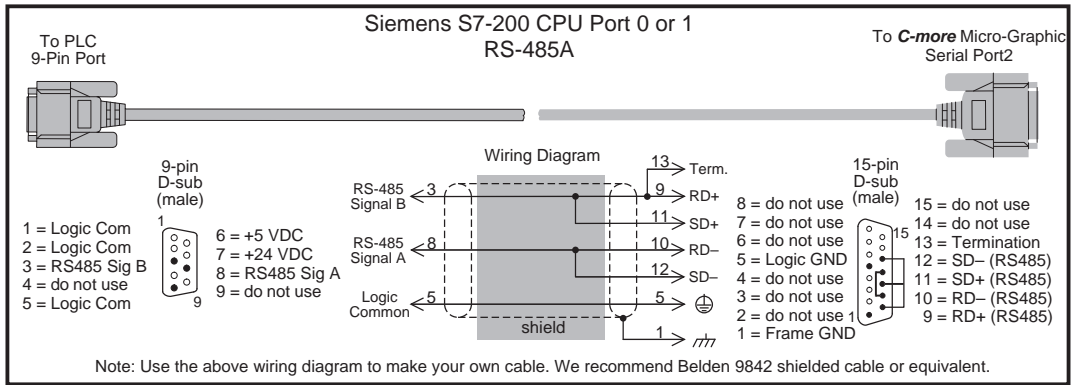


Diagram 14

User Constructed

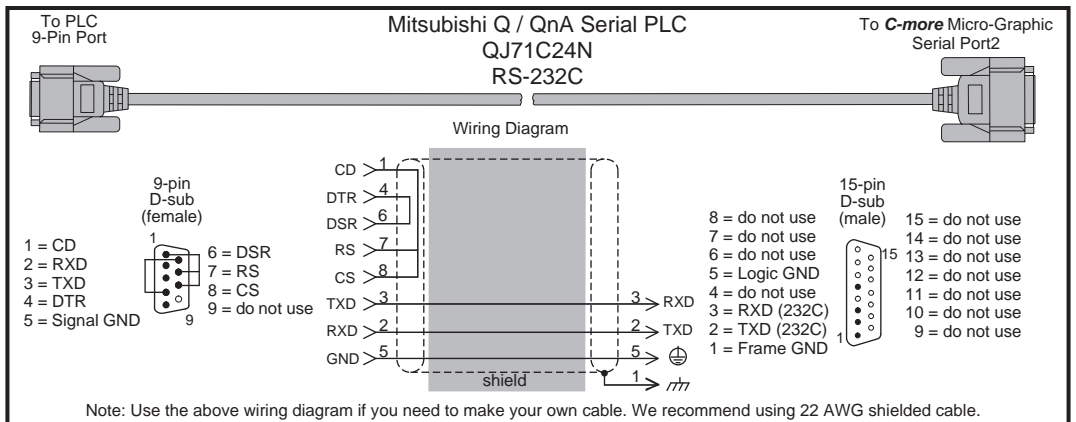
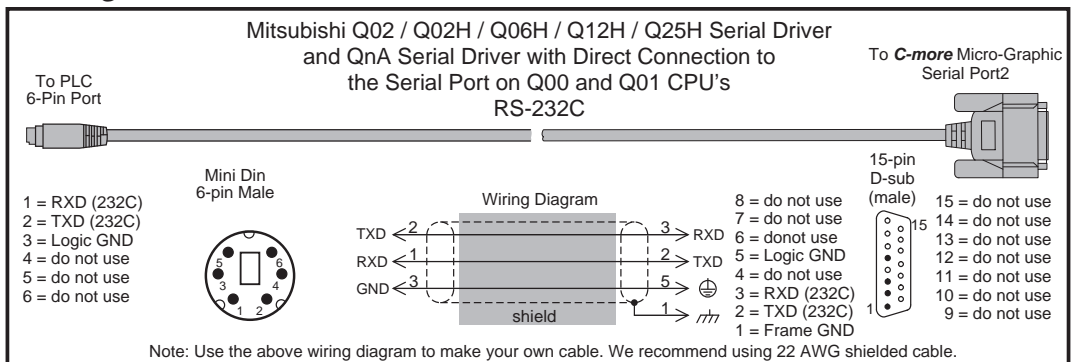


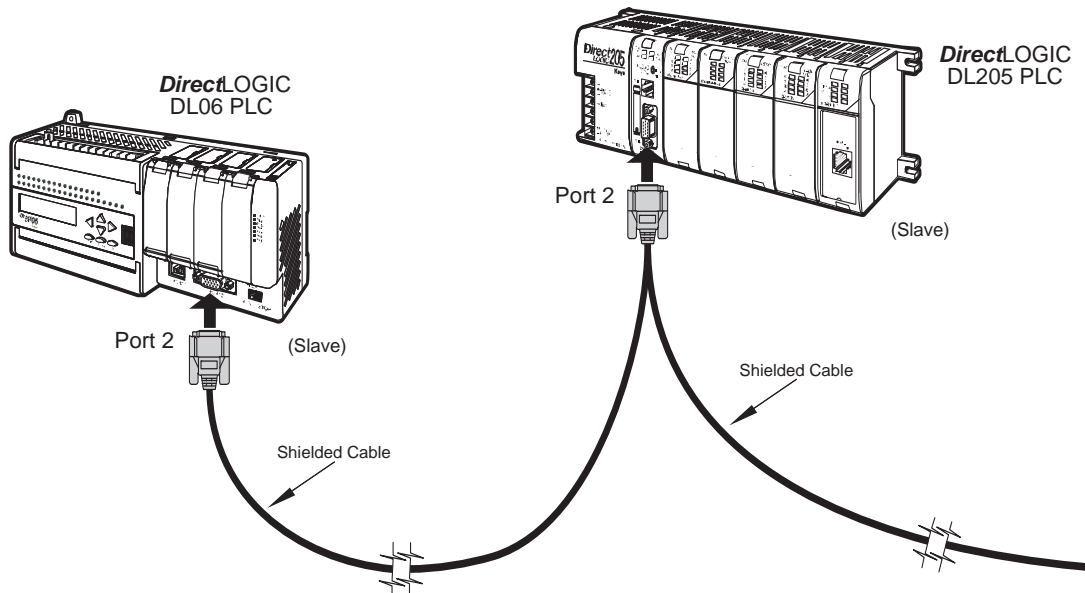
Diagram 15

User Constructed

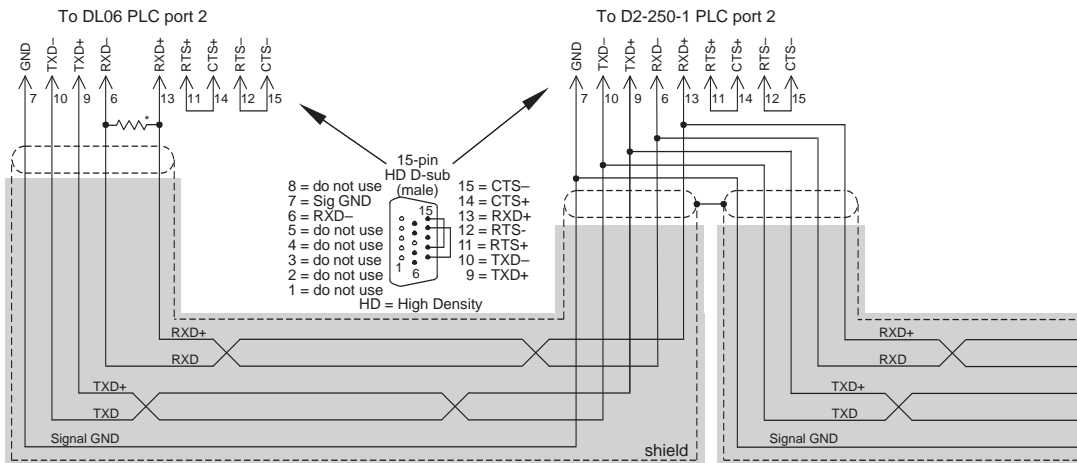


# RS-422A/RS-485A Multi-Drop Wiring Diagram Examples

6



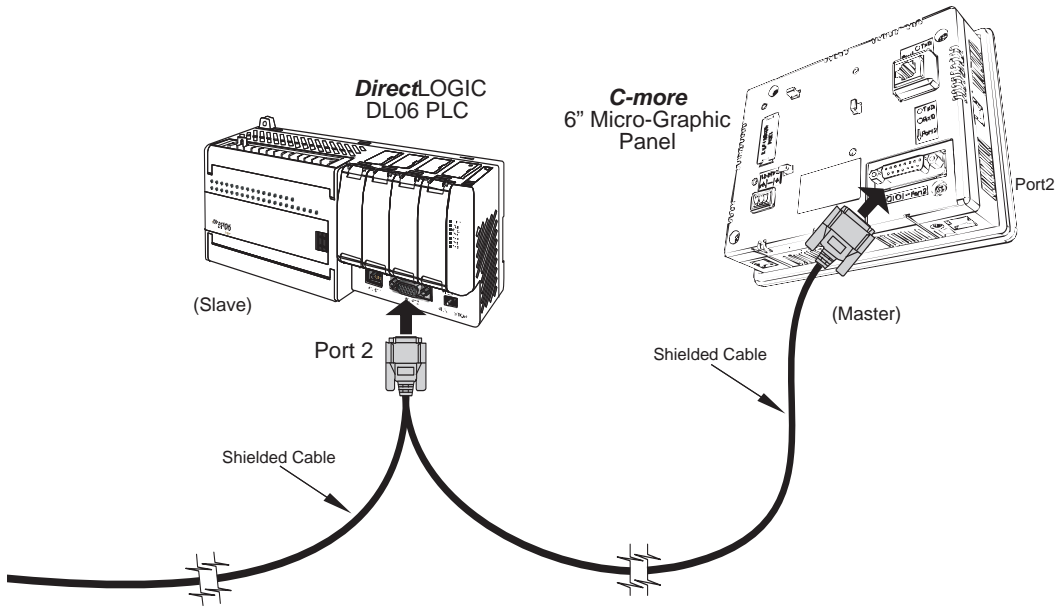
Note: We recommend Belden 8103 shielded cable or equivalent.



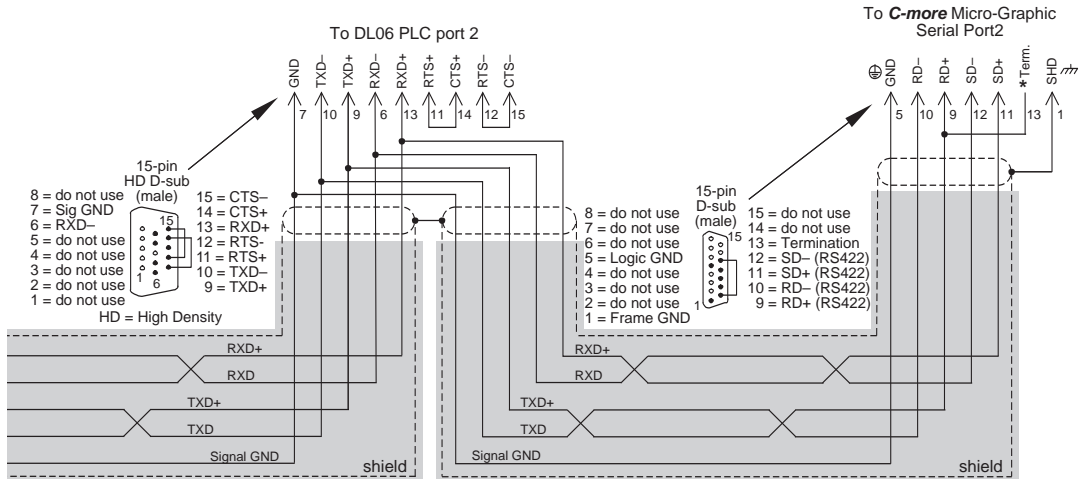
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

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.



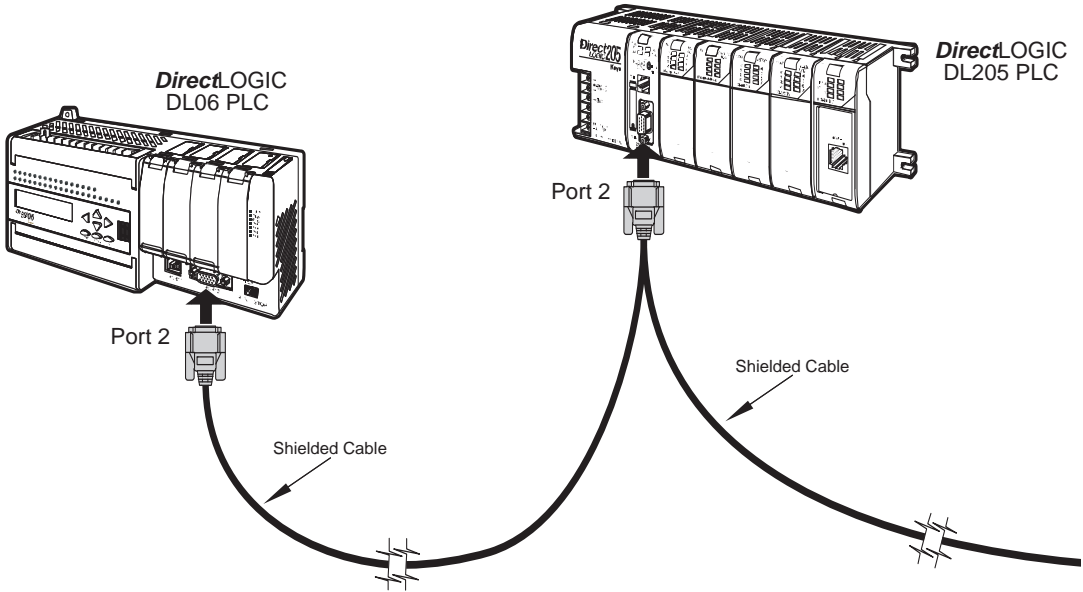
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more 6" Micro-Graphic Serial Port2 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

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

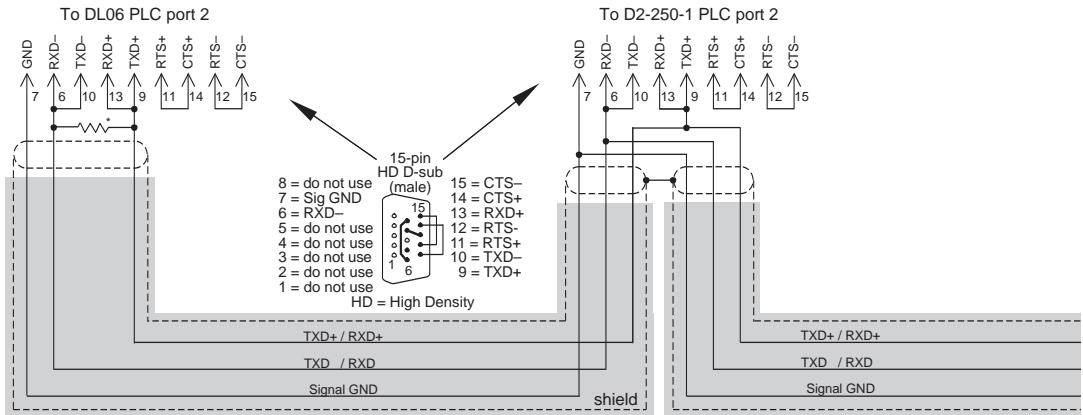


# RS-422A/RS-485 Multi-Drop Wiring Diagram Examples (cont'd)

6



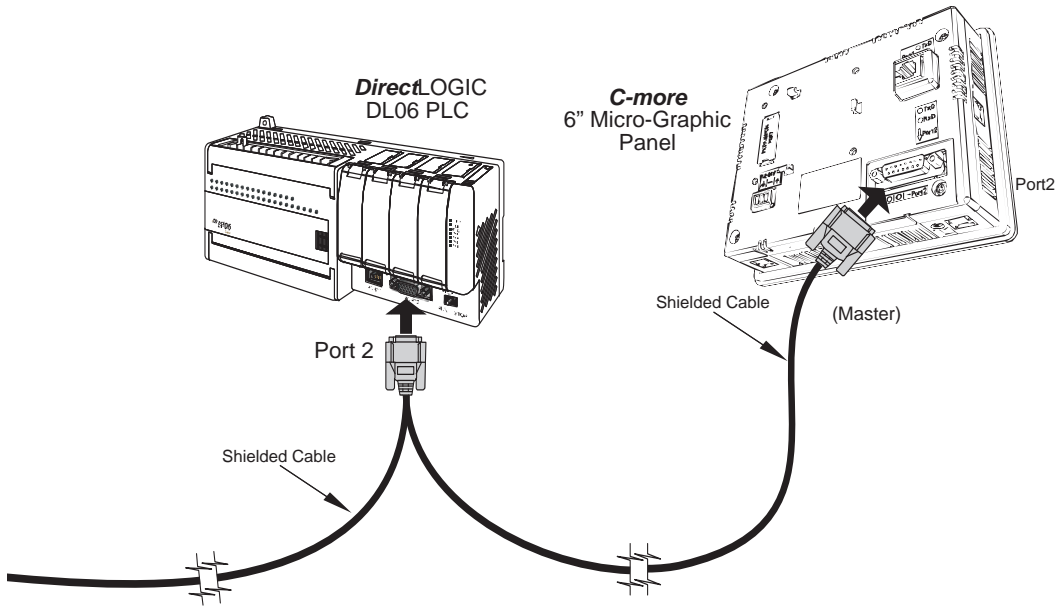
Note: We recommend Belden 88102 shielded cable or equivalent.



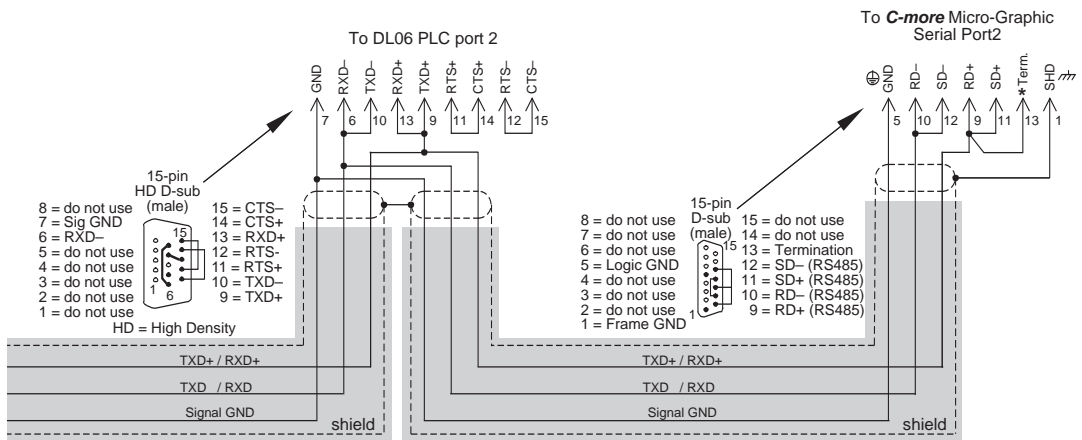
\* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-485 Multi-Drop Wiring Diagram

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



Note: We recommend Belden 88102 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 6" Micro-Graphic Serial Port 2 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-485 Multi-Drop Wiring Diagram (cont'd)



# MAINTENANCE

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# CHAPTER 7

## In This Chapter...

|  |     |
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| Project Backup .....   | 7-2 |
| Check Operating Environment .....                                      | 7-2 |
| Check Operating Voltage .....  | 7-2 |
| Check Transmit and Receive Indicators .....                            | 7-3 |
| Check Physical Conditions .....  | 7-3 |
| Run Tests under the System Setup Screens .....                         | 7-4 |
| Check Settings under the System Setup Screens .....                    | 7-5 |
| Cleaning the Display Screen .....                                      | 7-5 |
| Check Project Functionality .....                                      | 7-6 |
| Checks from the <i>C-more</i> Micro-Graphic Programming Software ..... | 7-6 |

# 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 @ 10.2 VDC (630mA)).

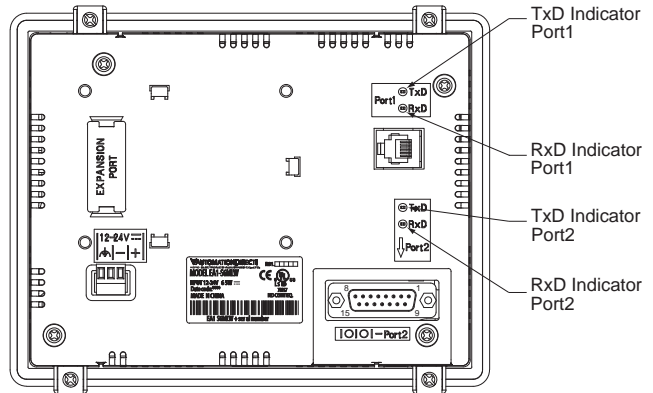


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection. **Low-Power Mode** is intended for initial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

## 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

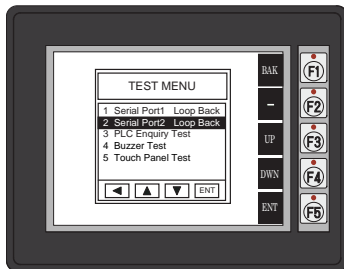
Make sure that harmful chemicals are not being used around the *C-more 6"* Micro-Graphic panel. Look for any deterioration of the panel's bezel and front display area. See **Chapter 2: Specifications** for a chemical compatibility list.

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**.

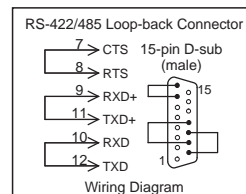
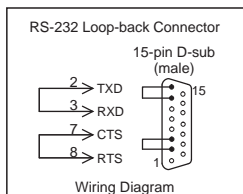
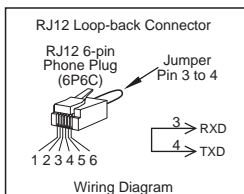
## Run Tests under the System Setup Screens

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 8, and the range is 1 to 16, with 16 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

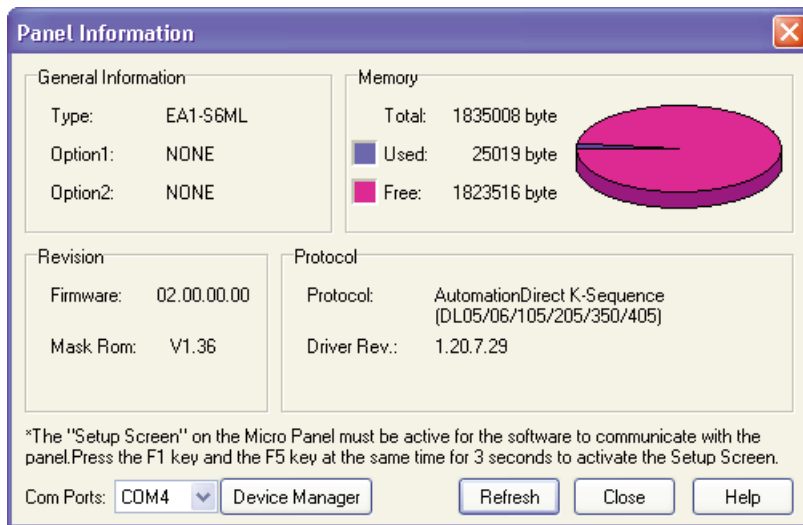
During a routine maintenance schedule is a good time to check the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application. 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:



# TROUBLESHOOTING

---



# CHAPTER 8

## In This Chapter...

|  |      |
|--|------|
| <i>C-more 6" Micro-Graphic Panel does not Power up</i> .....     | 8-2  |
| Display is Blank .....   | 8-2  |
| Display is Dim .....   | 8-3  |
| No User Program .....  | 8-3  |
| Lost Firmware – Red 'Update Mode' Screen Displayed .....         | 8-4  |
| Updating Firmware .....  | 8-4  |
| No Communications between Panel and PC (Personal Computer) ..... | 8-5  |
| No Communications between Panel and PLC .....                    | 8-7  |
| Panel & PLC Error Codes .....                                    | 8-8  |
| <i>C-more Micro-Graphic Panel Runtime Errors</i> .....           | 8-9  |
| Electrical Noise Problems .....                                  | 8-10 |

## 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.

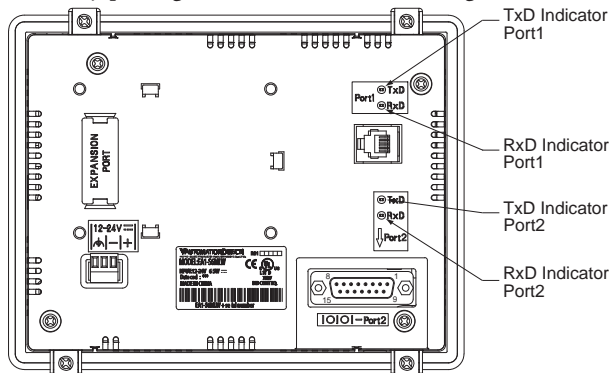
### *C-more* 6" Micro-Graphic Panel does not Power up

**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.

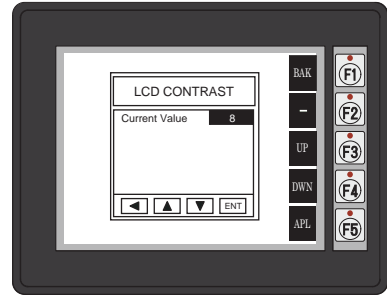
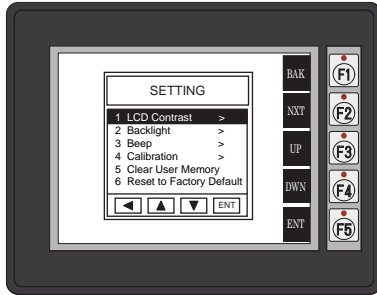


**NOTE:** When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection. **Low-Power Mode** is intended for initial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

## 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. **Low-Power Mode** is intended for initial programming. For full brightness, connect an external 12-24 VDC power source when the panel is installed in its application.

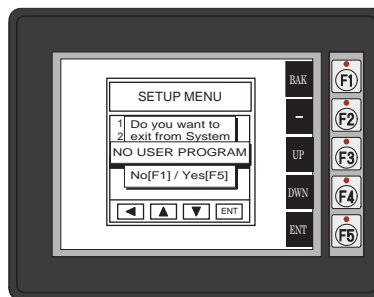


Press the F1 and F5 keys simultaneously for 3 seconds and the panel will bring up the the System Setup Screen menu. Select the Setting menu, and then select item 1; LCD Contrast. The default value is 8. Adjust the current value from 1 to 16 and the panel's contrast should become greater as the value 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

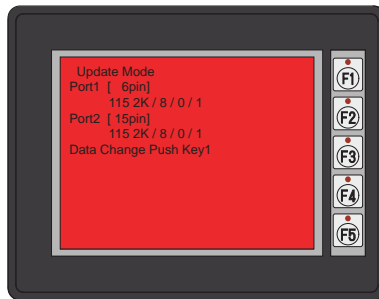
If the panel is displaying the message "No User Program" after it is powered up, then there is no project downloaded into the panel. Using the EA-MG-PGMSW *C-more* Micro-Graphic Programming Software, download your project to the panel.



### 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.



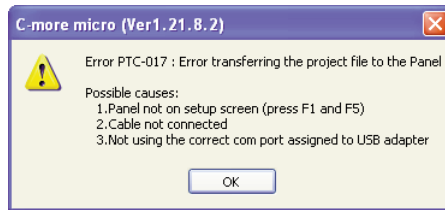
### Updating Firmware

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:

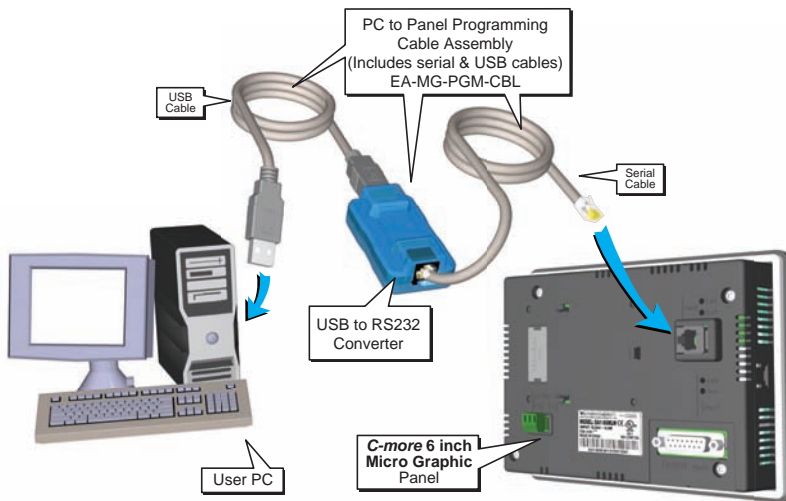
- 1.) Create a backup copy of the project on the PC. From the *C-more* Micro-Graphic programming software, read the project from the panel and save to a desired location.
- 2.) Update the programming software on the PC.
- 3.) Cycle power to the panel.
- 4.) Update the firmware to the panel using the **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.



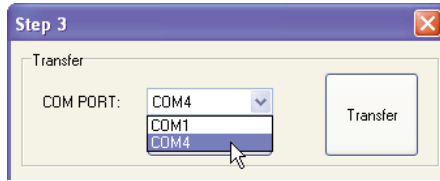
**NOTE:** When properly installed the programming cable will look like a serial communications port to the PC.

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



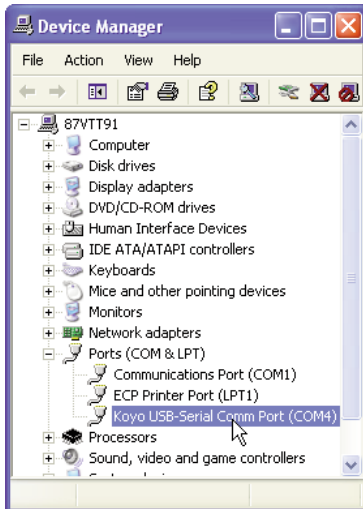
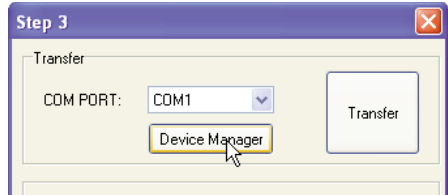
## No Communications between Panel and PC (Personal Computer) (cont'd)

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.

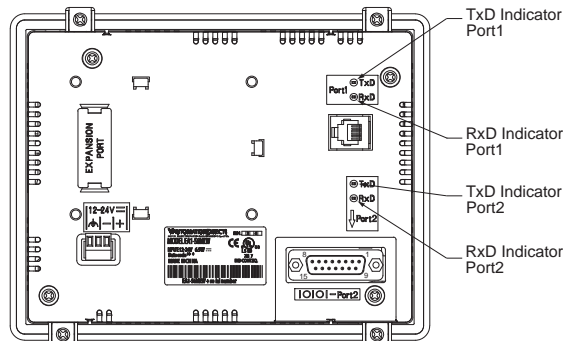
If you have selected the correct COM port and the error still occurs, try connecting the programming cable to a different USB port on the PC and try again.

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

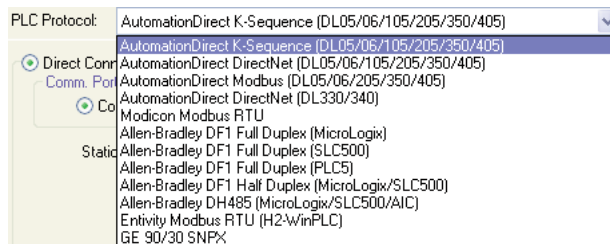
The *C-more* Micro-Graphic panel communicates with a designated PLC or controlling device through the panel's RS-232 RJ12 serial communications port (Port1) or RS-232 / RS-485 / RS-422 communications port (Port2).

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.

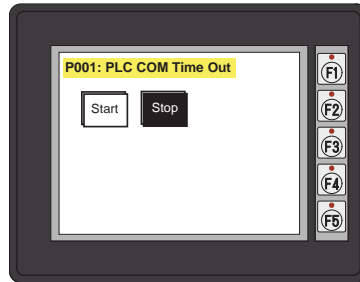
If a *C-more* Micro-Graphic communication error does occur, the error message will be displayed in the upper left of the panel's display screen along with the error code number. The error code with error message will blink off and on. .



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

## 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.

### 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.

## 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.<br>Cycle power at the panel.<br>See Chapter 8 for Electrical Noise Problems.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.   |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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.            |

### 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 Overview

| Part Number     | Description   |
|-----------------|---|
| EA-MG-BZ2-BRK   | Replacement mounting clip for <i>C-more</i> 6" 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> 6" 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)

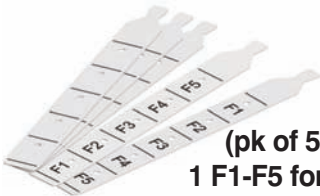
### Panel Gasket

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.**



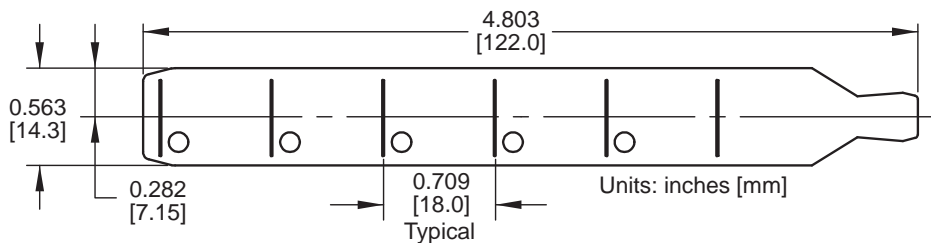
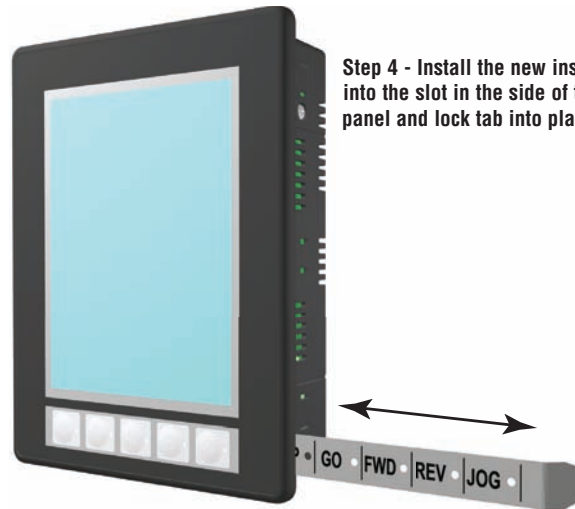
**Step 2 - Remove the protective film from the blank key label insert.**



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

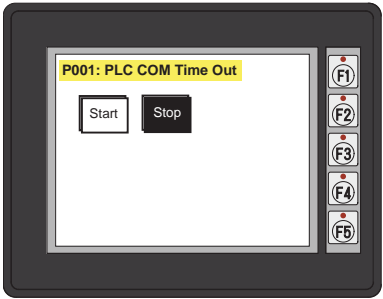
The *C-more*® Micro-Graphic panels are capable of communicating over RS232, RS422 and RS485 serial networks. They communicate with CLICK PLC's, all controllers in the *Direct LOGIC* family of PLCs utilizing various protocols and certain 3rd party PLCs. For a complete list of the supported PLCs and protocols, 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 preceding 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)

A

| 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.<br>Data was sent to the PLC via the Serial Port.<br>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.                    |

## Modbus Protocols Error Code P499 Explanation

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

AutomationDirect CLICK

AutomationDirect DirectLOGIC - Modbus (Koyo)

Modicon Modbus RTU

Entivity Modbus RTU



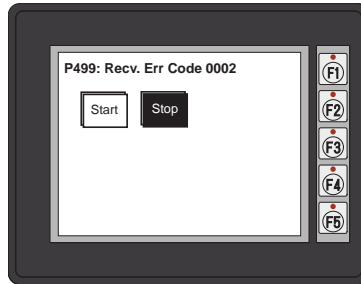
**Note:** The following errors can be generated from the designated PLC, are monitored by the **C-more** Micro-Graphic panel, and displayed on the panel's screen as a hexadecimal value in panel error code P499, if active.

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

## 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 users manual for additional information.

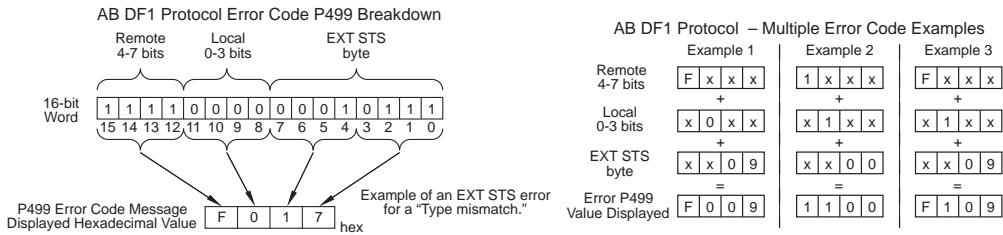
| PLC Error Codes for <i>Direct</i> LOGIC – K-Sequence |                      |
|--|----------------------|
| Panel Error Code<br>P499 Hex Value                   | Description          |
| 01F8   | Error setting value. |
| 020D   | Error in key mode.   |
| 021C   | Password protected.  |

## DirectLOGIC – DirectNET PLC Error Codes

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

# 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.



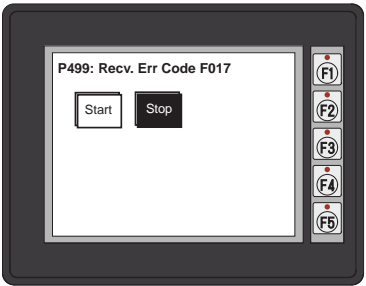
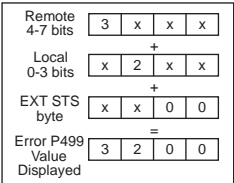
## Allen-Bradley PLC Error Code Displayed Example

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 users manual for additional information.

**PLC Errors for Allen-Bradley DF1 Protocol, Remote STS Errors (4-7 bits)**

| Panel Error Code<br>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<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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<br>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;<br>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 users manual for additional information.

### PLC Errors for Allen-Bradley DH485 Protocol, Local STS Errors (0-3 bits)

| Panel Error Code<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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<br>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.)

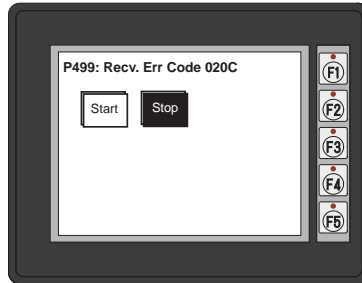
Allen-Bradley DH485 Protocol – PLC Error Code Tables (cont'd)

| PLC Errors for Allen-Bradley DH485 Protocol, EXT STS Command Code for F0 Command |   |
|--|---|
| Panel Error Code<br>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.

### 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 users manual for additional information.

| PLC Errors for GE SNPX Protocol (Major) |  |
|---|--|
| Panel Error Code<br>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.<br>(Series 90-70 PLC CPUs only)   |
| 0x0051                                  | Problem with getting mail from the slave Service Request task.<br>(Series 90-70 PLC CPUs only)   |
| 0x0055                                  | Slave SNP task timed out before receiving an SRP response.<br>(Series 90-70 PLC CPUs only)   |
| 0x0056                                  | Slave SNP task could not find the requested datagram connection.<br>(Series 90-70 PLC CPUs only)   |
| 0x0057                                  | Slave SNP task encountered an error in trying to write the datagram.<br>(Series 90-70 PLC CPUs only)   |
| 0x0058                                  | Slave SNP task encountered an error in trying to update the datagram.<br>(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<br>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.<br>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.<br>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.<br>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.<br>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.<br>Modem is unable to complete the requested connection.<br>Check the local and remote modems and the telephone line.   |
| PLC Error 0x070F                                       | Queue Full indication from Service Request Processor in slave PLC CPU.<br>The slave is temporarily unable to complete the service request.<br>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<br>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;<br>the SNP-X slave device cannot return the data in an X-Response message.<br>(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.<br>(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.<br>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.<br>Must be 1 for I/O Fault Table, or 2 for PLC Fault Table.  |
| 0x100F   | Unexpected Service Request Processor error.<br>(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.<br>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.<br>Must be 0 for Series 90-70, or 1 for Series 90-30 or Series 90-20.  |
| 0x170C   | Invalid datagram type.<br>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<br>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).<br>Must use a smaller data length. Use multiple COMMREQs if necessary.  |
| 0x1D0C   | Invalid SNP-X communication session type.<br>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.<br>The Broadcast SNP ID is not permitted in a single-slave SNP-X session.<br>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.<br>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.<br>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.<br>A maximum of two retries are permitted.<br>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.<br>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<br>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.<br>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.<br>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).<br>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<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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<br>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<br>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)

| PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd) |  |
|--|--|
| Panel Error Code<br>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 *C-more* 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.

## Mitsubishi Q / QnA Series – PLC Error Codes

The following table lists the errors that can be generated by the Mitsubishi Q / QnA Series PLC when using the Q / QnA 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 users manual for additional information.

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |   |
|---|---|
| Panel Error Code<br>P499 Hex Value                  | Description   |
| 0x4000  | Serial communications checksum error. Check cable and grounding.  |
| 0x4001  | Unsupported request sent to PLC.  |
| 0x4002  | Unsupported request sent to PLC.  |
| 0x4003  | Global request sent to PLC that cannot be executed.   |
| 0x4004  | System protect switch is on and request was sent that cannot be executed. Also PLC, may still be booting up.                                  |
| 0x4005  | Packet sent is too large according to size request in header.   |
| 0x4006  | Serial communications could not be initialized.   |
| 0x4008  | CPU busy or buffer full.  |
| 0x4010  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4013  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4021  | Drive memory does not exist.  |
| 0x4022  | File (ZR memory) does not exist.  |
| 0x4023  | File (ZR memory) name and File (ZR memory) number do not match.   |
| 0x4024  | File (ZR memory) inaccessible by user.  |
| 0x4025  | File (ZR memory) is locked by another device.   |
| 0x4026  | File (ZR memory) password required.   |
| 0x4027  | Specified range is out of File (ZR memory) range.   |
| 0x4028  | File (ZR memory) already exist.   |
| 0x4029  | Specified File (ZR memory) capacity cannot be retrieved.  |
| 0x402A  | Specified File (ZR memory) is abnormal.   |
| 0x402B  | The requested data cannot be executed in the specified drive memory.  |
| 0x402C  | The requested operation cannot be executed presently.   |
| 0x4030  | The specified data type does not exist. Check the CPUs allowable data types.  |
| 0x4031  | The specified address is out of range. The data type requested may need to be expanded in GX developer. The CPU may not allow this data type. |
| 0x4032  | Address qualification is incorrect.   |
| 0x4033  | Cannot write to system area.  |
| 0x4034  | Request cannot be executed because completion address for an instruction cannot be turned on.   |

(PLC generated error codes for the Mitsubishi Q / QnA protocol continued on the next page.)

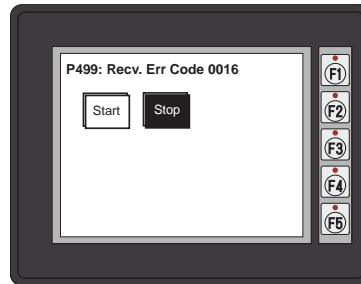
## Mitsubishi Q / QnA Series – PLC Error Codes (cont'd)

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |  |
|---|--|
| Panel Error Code<br>P499 Hex Value                  | Description  |
| 0x4040  | Module doesn't support request.  |
| 0x4041  | Request is out of module's range.  |
| 0x4042  | Module cannot be accessed.   |
| 0x4043  | Address for specified module is incorrect.                                     |
| 0x4044  | Hardware problem exist for specified module.                                   |
| 0x4050  | Request cannot be executed because memory card protect switch is on.           |
| 0x4051  | Specified memory cannot be accessed.   |
| 0x4052  | Specified memory attribute is read only and cannot be written to.              |
| 0x4053  | Error occurred when writing to specified memory location.                      |
| 0x4080  | Request data error. Check cabling and electrical noise.                        |
| 0x4082  | Specified request is already being executed.                                   |
| 0x408B  | The remote request cannot be performed.  |
| 0x40A0  | A block number out of range was specified.                                     |
| 0x40A1  | The number of blocks requested exceeds the range of the PLC.                   |
| 0x40A2  | A step number was specified out of range.                                      |
| 0x40A3  | Step range limit exceeded.   |
| 0x40A4  | Specified sequence step number is out of range.                                |
| 0x40A5  | Specified SFC device is out of range.  |
| 0x40A6  | Block specification and step specification are incorrect.                      |
| 0x4100  | CPU module hardware fault.   |
| 0x4101  | Serial communication connection incorrect.                                     |
| 0x4105  | CPU module internal memory fault. Bad CPU.                                     |
| 0x4106  | CPU is in initialization. Wait until CPU is booted up.                         |
| 0x4107  | Specified function not supported by this CPU. Check memory types for that CPU. |
| 0x4110  | Specified function not supported because CPU is in Stop. Put CPU in Run.       |
| 0x4111  | System is not up yet. Wait until system is up before performing request.       |
| 0x4A01  | The network number specified does not exist. Routing not supported in C-more.  |
| 0x4A02  | Station number specified does not exist. Routing not supported in C-more.      |

## 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<br>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<br>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<br>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.                                     |

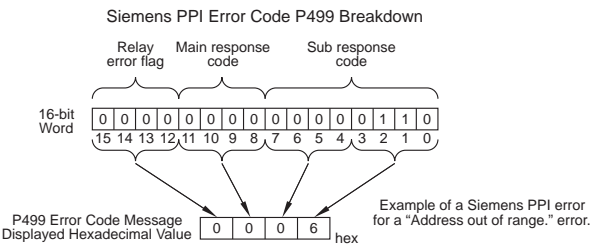
(PLC generated error codes for the Omron FINS protocol continued on the next page.)

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

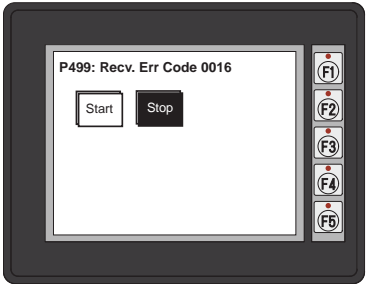
| PLC Error Codes for Omron FINS     |  |
|------------------------------------|--|
| Panel Error Code<br>P499 Hex Value | Description                                |
| 0x2507                             | Unit Error: I/O bus error.                 |
| 0x2509                             | Unit Error: 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<br>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**

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# 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.<br>Cycle power at the panel.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | See Chapter 8 for Electrical Noise Problems.<br>Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.       |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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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**C-more 3" 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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# GETTING STARTED

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# CHAPTER 1

## In This Chapter...

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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.

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# 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

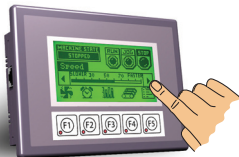
The beginning of each chapter will list the key topics that can be found in that chapter.

|                           |           |
|---------------------------|-----------|
| Getting Started           |           |
|                           | CHAPTER 1 |
| In This Chapter...        |           |
| General Information ..... | 1-2       |
| Specifications .....      | 1-4       |

# 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 AutomationDirect CLICK and most *Direct*LOGIC 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)

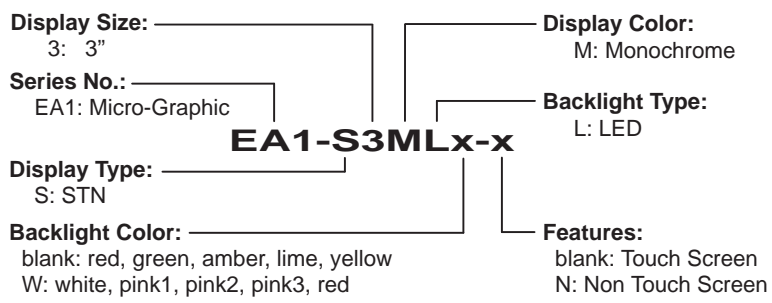
# Agency Approvals

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



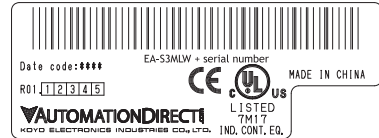
# Part Number Key

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)

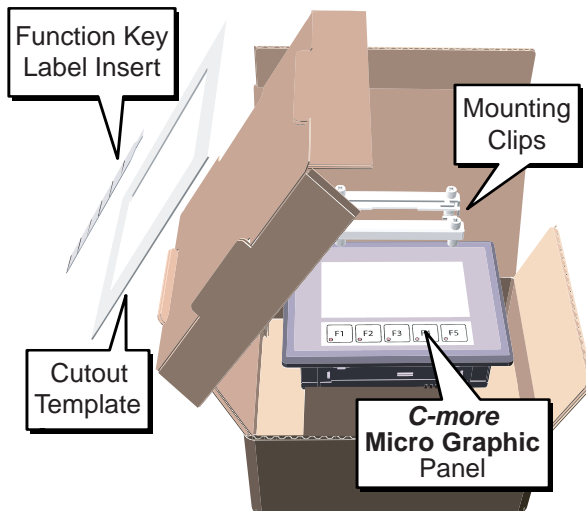
**F:** Manufacturing Site (0 9, A Z)

**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**

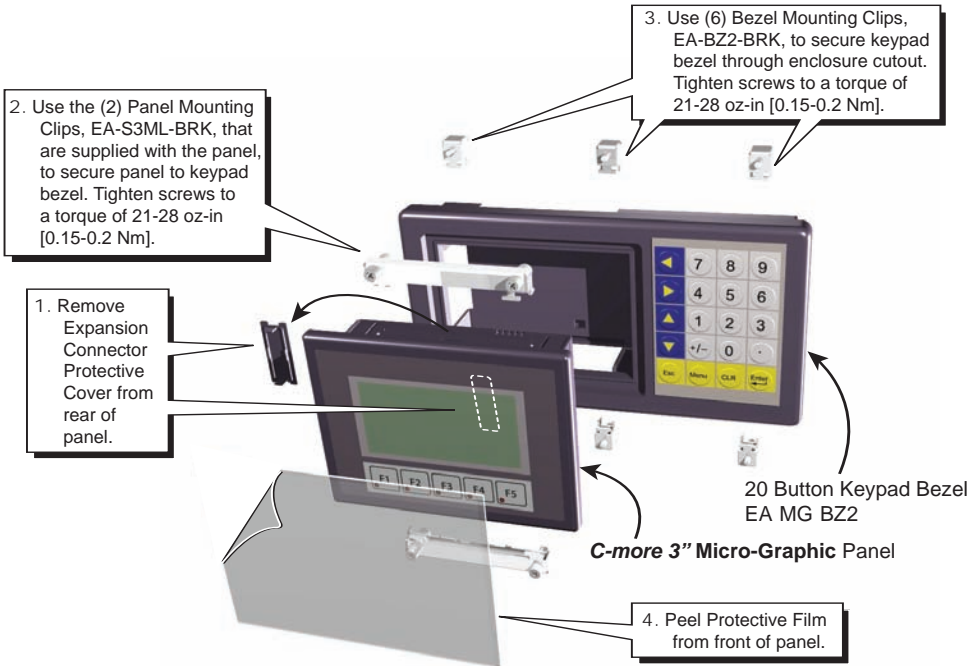


**20-Button Keypad Bezel  
EA-MG-BZ2**



### Step 2 – Install Optional Hardware Accessories

Below is an example of a *C-more* 3" 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**



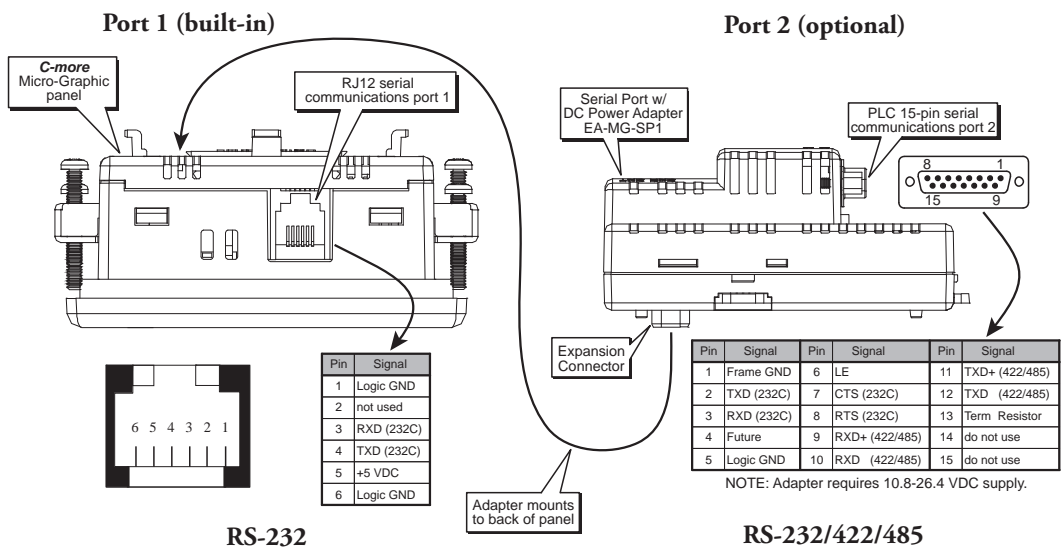
**Clear Screen Overlay  
EA-MG-COV-CL**





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 select AutomationDirect 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.

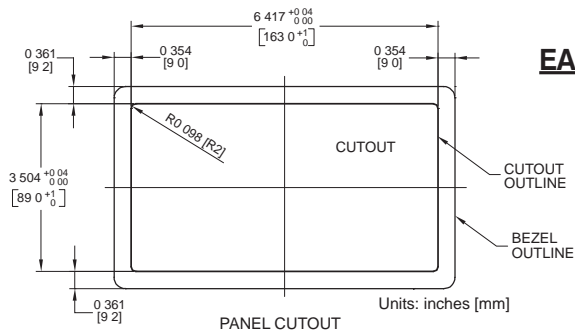
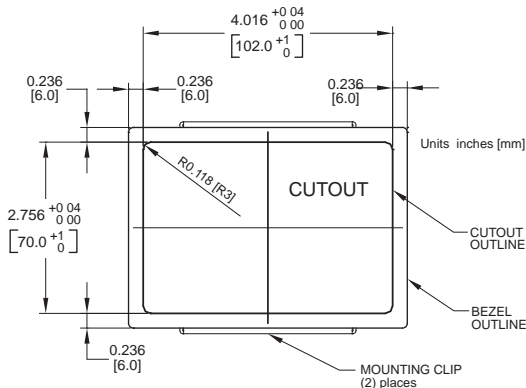
## Step 4 – Install *C-more* Micro-Graphic Panel

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].

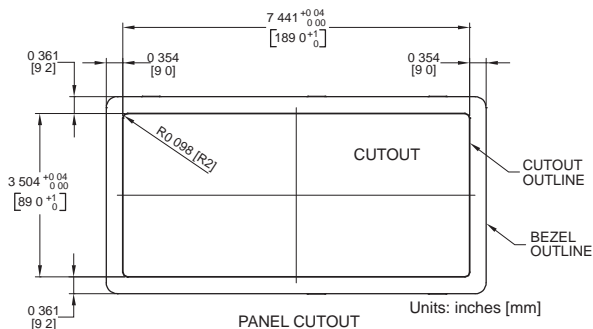
See Chapter 2: Specifications for additional product dimensions.

### Port 1 (built-in)



### EA-MG-BZ1 Keypad Bezel Cutout

### EA-MG-BZ2 Keypad Bezel Cutout



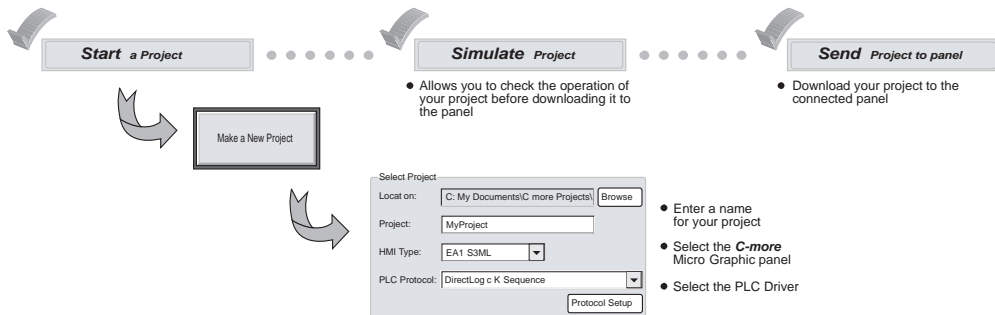
**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

## Step 5 – 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); 512 MB free RAM (1GB recommended) for Vista
- 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 @ 770-844-4200.



### Step 6 – Connect *C-more* 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.

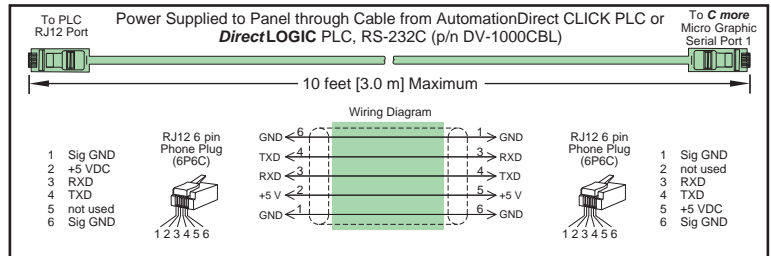
#### USB to RS-232 Programming Cable Assembly



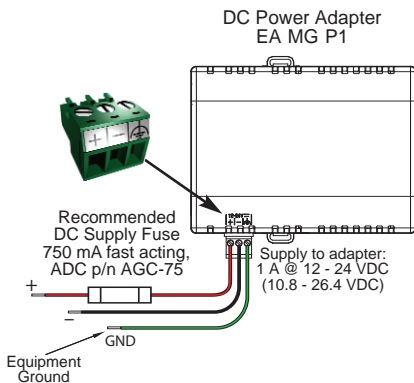
## Step 7 – Provide Power to the *C-more* Micro-Graphic Panel

- 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 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.

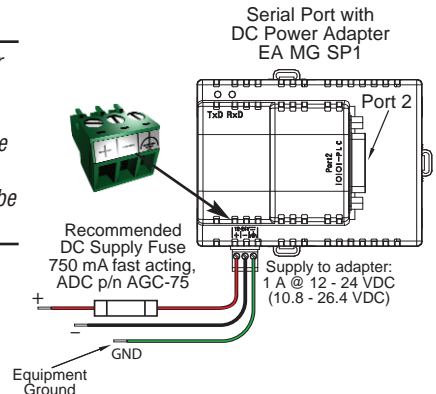
### Panel Powered from *Direct*LOGIC PLC via Communications Cable



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

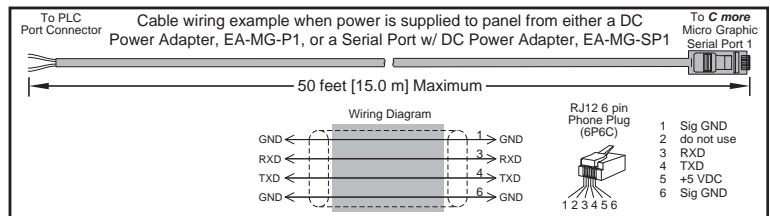


**NOTE:** If either DC power adapter is installed on the panel, the adapter must be powered.



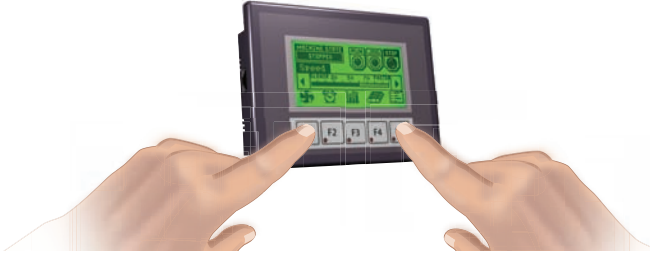
**NOTE:** Recommended DC power supply to power either DC Power Adapter, *AutomationDirect* Part No. PSP24-024S or PSP24-024C.

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



## Step 8 – Accessing the C-more 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.

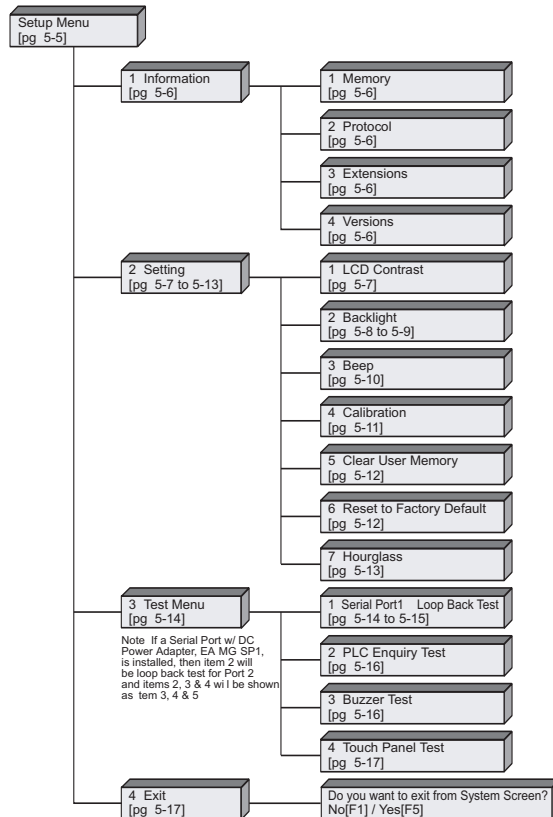
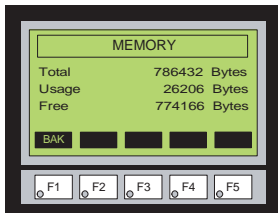
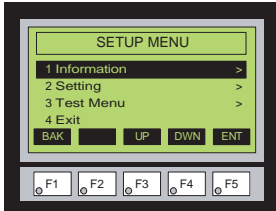


From the **Setup Menu**, information about the panel can be obtained, settings can be adjusted, and panel functions can be tested.



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

### Examples



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

| PLC Drivers                    |  |
|--------------------------------|--|
| <i>Serial - port1 or port2</i> | <i>Serial - port2 only</i>                       |
| AutomationDirect CLICK         | Allen-Bradley DF1 Half Duplex                    |
| AutomationDirect K-sequence    | Allen-Bradley DF1 Full Duplex                    |
| AutomationDirect DirectNET     | Allen-Bradley PLC5 DF1                           |
| AutomationDirect Modbus        | Allen-Bradley DH485                              |
| Modicon Modbus RTU             | GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro) |
| Entivity Modbus RTU            | Mitsubishi FX                                    |
|                                | Mitsubishi Q & QnA                               |
|                                | 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>Cables for direct connect to panel's serial port 1<br/>(Panel powered from PLC's serial port.)</b>                      |                   |
| AutomationDirect CLICK, <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)<br>Use with DV-1000CBL cable.          | <b>FA-15HD</b>    |
| <b>Direct</b> LOGIC PLC 15-pin D-sub port, DL405 (RS-232C).<br>Use with DV-1000CBL cable.                                  | <b>FA-CABKIT</b>  |
| <b>Cables for direct connect to panel's serial port 1<br/>(Panel powered from DC Power Supply)</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 port 2</b>  |                        |
| AutomationDirect CLICK, <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>    |

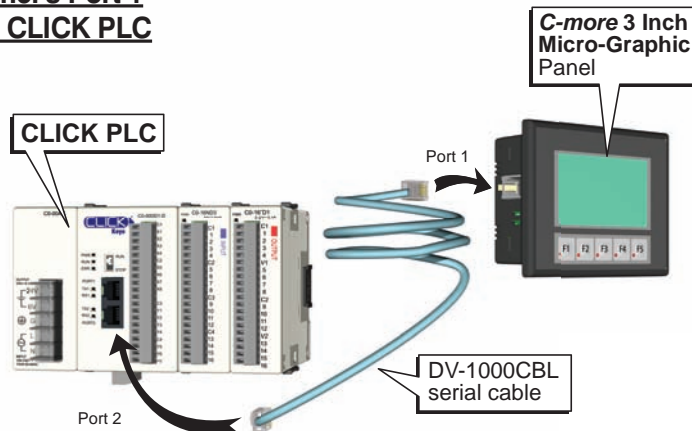


**NOTE:** See Chapter 6: PLC Communications for a detailed chart of PLC compatibility & cable connections. Chapter 6 includes wiring diagrams for end user construction of certain cables.

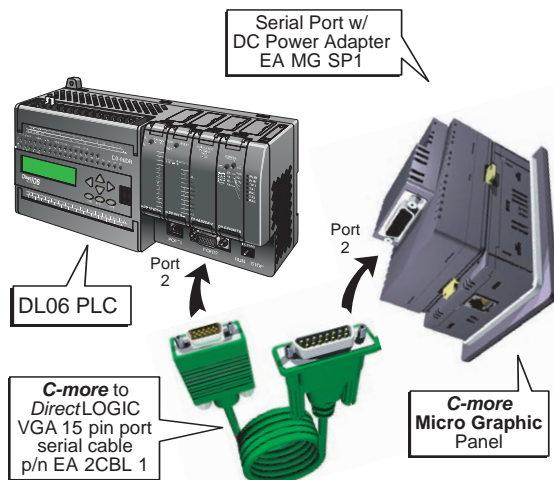
### Step 10 – Connect *C-more* Micro-Graphic Panel to PLC

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 CLICK PLC



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





# SPECIFICATIONS

---



# CHAPTER 2





## In This Chapter...

|                                     |     |
|-------------------------------------|-----|
| Available Models .....              | 2-2 |
| Model Specifications .....          | 2-3 |
| Panel Dimensions (all models) ..... | 2-5 |
| Communications Ports .....          | 2-6 |
| Chemical Compatibility .....        | 2-7 |

## Available Models

The *C-more*<sup>®</sup> 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.

| <i>C-more</i> Micro-Graphic Panels |   |  |
|------------------------------------|---|--|
| Part Number                        |   | Description  |
| <b>EA1-S3ML</b>                    | <b>Touch Screen</b><br>  | 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>                  | <b>Non-Touch</b><br>     | 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>                  | <b>Touch Screen</b><br> | 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>                | <b>Non-Touch</b><br>   | 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<br>Touch Screen   | 3” STN Micro-Graphic Panel<br>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,<br>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<br>6 o'clock axis → 45 degrees<br>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<br>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.<br>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).<br>Optional serial communications port (RS-232, RS-485/422) when using the optional<br>EA-MG-SP1 Serial Port with DC Power Adapter. |  |
| • Expansion Connection        |       | Yes – used with optional Keypad Bezels, EA-MG-BZ1 & EA-MG-BZ2, and<br>EA-MG-P1 DC Power Adapter, and EA-MG-SP1 Serial Port with DC Power Adapter.                                      |  |

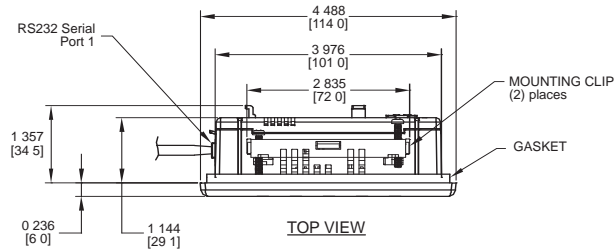
Specification table continued at the top of the next page.

## Model Specifications (cont'd)

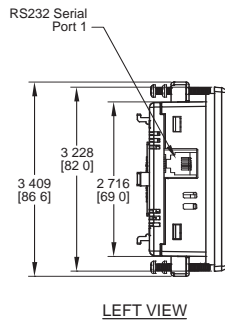
| Specification                               | Model | 3" STN Micro-Graphic Panel<br>Touch Screen  | 3" STN Micro-Graphic Panel<br>non Touch Screen |
|---|-------|---|--|
| Part Number:                                |       | EA1-S3ML, EA1-S3MLW   | EA1-S3ML-N, EA1-S3MLW-N                        |
| 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, Key Configuration Object, Line Graph, Real Time Graph, Bar Meter |  |
| • 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, ADC p/n AGC-25<br>No fuse required when directly connected to a PLC or PC with recommended cable.   |  |
| • Max. Inrush Current                       |       | 1 A for 500 $\mu$ s   |  |
| • 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. ( $\pm 10\%$ ), 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<br>RFI, (145 MHz, 440 MHz 10 W @ 10 cm)<br>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                                |       | 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)

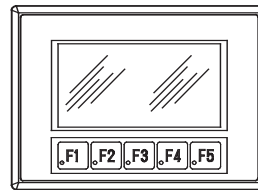
### Panel Dimensions



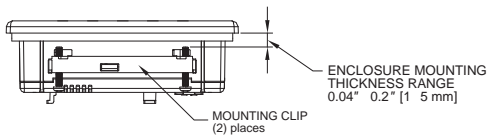
Units: inches [mm]



### C-more 3" Micro Graphic Panel

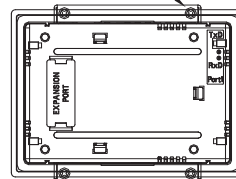


### Enclosure Thickness



### Mounting Clip Screw Torque

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

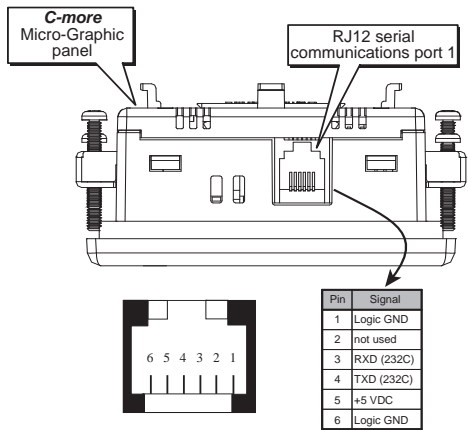


**NOTE:** A minimum clearance of 1.2 inches (30mm) must be maintained around and behind the panel to allow for proper cooling.

Communications Ports

2

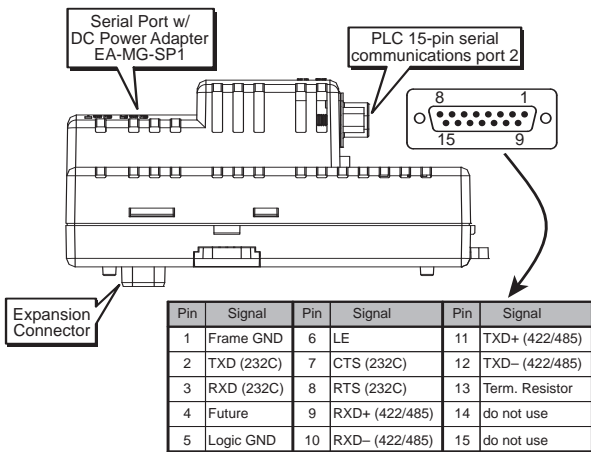
Port 1 (built-in)



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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[Density %, Temperature °C] |
|-------------------------------|---|--|--|
| Hydrochloric acid             | [15%] Excellent                                   | [10,RT] Excellent                          | Good   |
|                               |   | [20,RT] Good                               |  |
|                               | [30%] Good  | [20-80, RT]<br>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]<br>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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C]                  | Gasket – Silicone<br>[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%<br>+ nitric acid 4%] Good                |  |
|                       |   | [Sulfuric acid 40%<br>+ nitric acid 15%]<br>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 permangante |   | [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<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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]<br>Not Usable          |  |
| Steam                           |   | [above 150 degrees]<br>Not Usable          |  |
| Stearic acid                    |   | Excellent                                  |  |
| Styrene                         |   | Not Recommended                            |  |
| Sucrose solutions               |   | Excellent                                  |  |

Table continued at top of next page.

## Chemical Compatibility (cont'd)

2

| Chemicals                     | Screen Sheet – PET<br>[Density %, Temperature °C] | Bezel – ABS<br>[Density %, Temperature °C] | Gasket – Silicone<br>[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                     |  |
| Sulpherous 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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# CHAPTER 3



## In This Chapter...

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## Accessories

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### *C-more* 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. |

### *C-more* 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 CLICK or <b>Direct</b> LOGIC 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.   |

## C-more 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!



**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

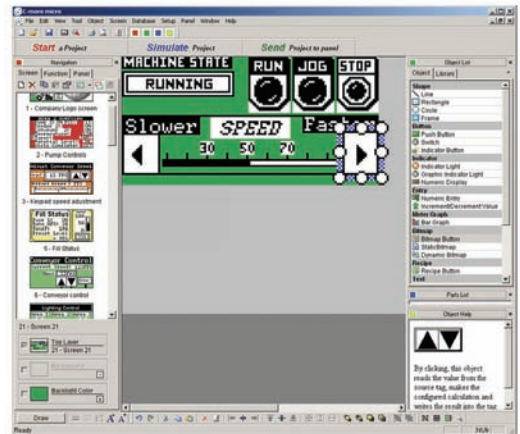
Lets you find the object you want fast. Just drag and drop it on the screen.

### 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 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); 512 MB free RAM (1GB recommended) for Vista
- 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






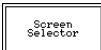




# Micro-Graphic Programming Software (cont'd)

## 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>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. One point is added at each refresh.  |         |
| 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 line is drawn in its entirety at each refresh.  |         |
| 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 C-more 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> |  |

## 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.

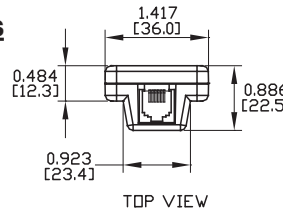
- Connect the USB programming cable (included) from a USB port type A on the PC to the USB type B port on the converter (included). Next connect the serial programming cable from the converter's RJ12 port to the panel's RJ12 serial port. The panel receives power from the USB port of the PC that it is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

### EA-MG-PGM-CBL



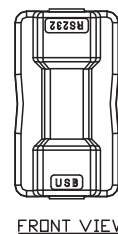
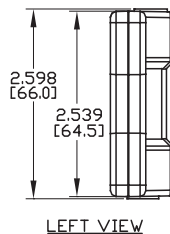
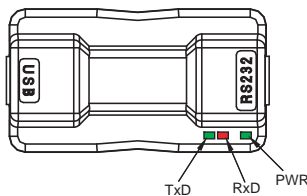
### Converter Dimensions

Units: inches [mm]

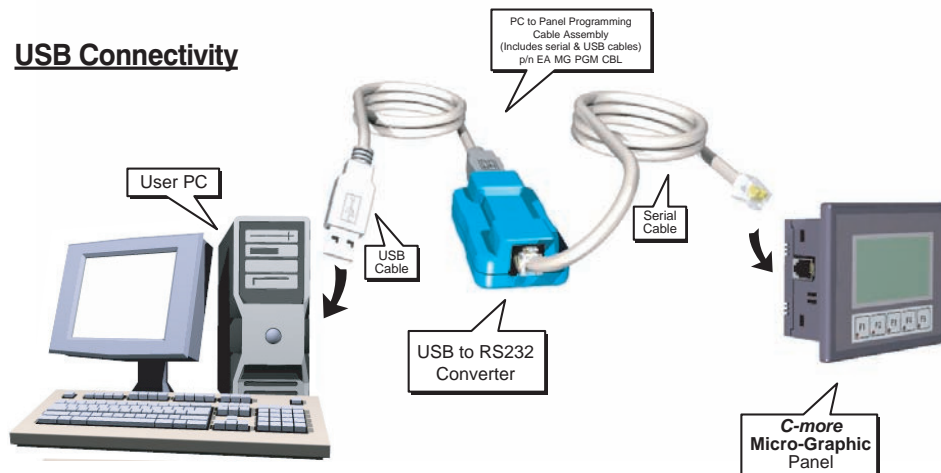


### Converter Status LEDs

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<br>Connector: USB Type B jack to accept USB Type B cable plug  |
| • Serial Interface   | RS232 (EIA-232-E)<br>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)<br>[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

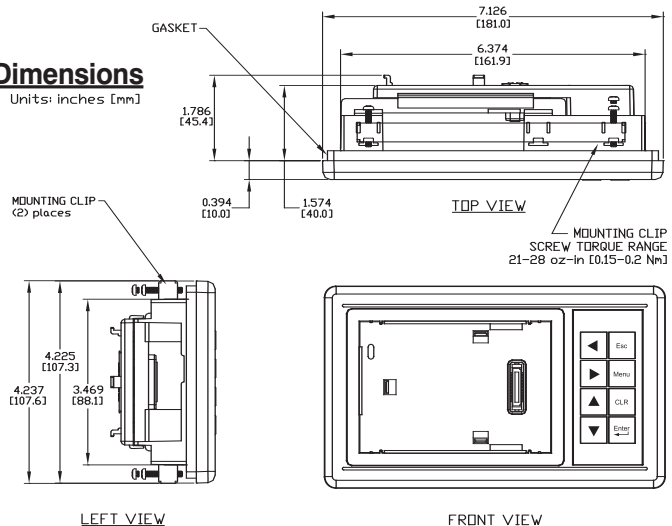
The 8-button keypad bezel can be used with both the touch and non-touch 3" Micro-Graphic panels. The keypad includes four directional arrow cursor buttons, and one each of an ESCAPE, MENU, CLEAR and ENTER button. The keypad is intended to be used with the numeric entry object (Style 3) to allow changing 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* 3" Micro-Graphic panel. No panel configuration is required.

### EA-MG-BZ1

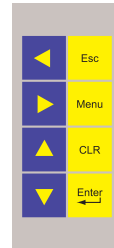
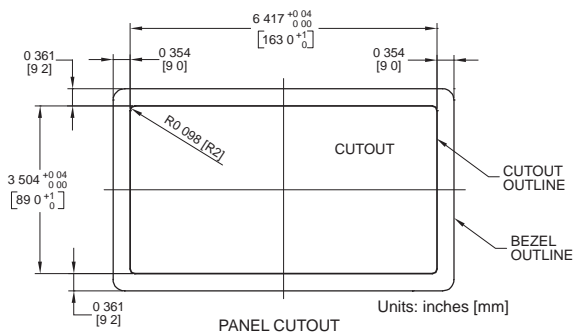


### Dimensions

Units: inches [mm]

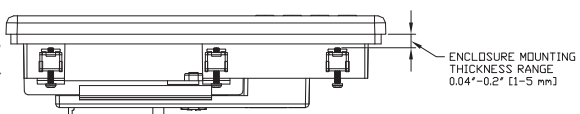


### Panel Cutout



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:                                       |  |
| • <b>C-more Micro-Graphic Panels Supported</b> | EA1-S3ML, EA1-S3MLW, EA1-S3ML-N, EA1-S3MLW-N   |
| • <b>Connection</b>                            | Connects with expansion connector on the rear of the <b>C-more</b> 3" 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. |
| • <b>Power Consumption</b>                     | None   |
| • <b>Keypad Button Life</b>                    | Minimum of 500,000 cycles  |
| • <b>Enclosure Mounting</b>                    | (2) mounting clips, EA-MG-BZ1-BRK, included.   |
|  | Note: The <b>C-more</b> 3" Micro-Graphic panel is installed into the keypad bezel using the mounting clips, EA-MG-S3ML-BRK, that are supplied with the panel.  |
| Environmental:                                 |  |
| • <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>Noise Immunity</b>                        | NEMA ICS3-304<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>Impulse 1000 V @ 1 µs pulse   |
| • <b>Enclosure</b>                             | NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)   |
| • <b>Agency Approvals</b>                      | CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382   |
| Physical:                                      |  |
| • <b>Dimensions</b>                            | 7.126" (W) x 4.225" (H) x 2.180" (D)<br>[181.0 mm x 107.3 mm x 55.4 mm]  |
| • <b>Weight</b>                                | 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.

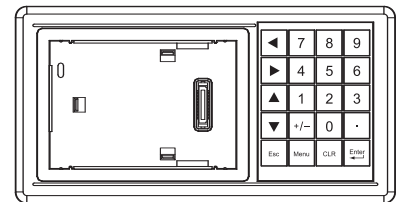
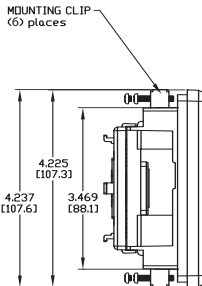
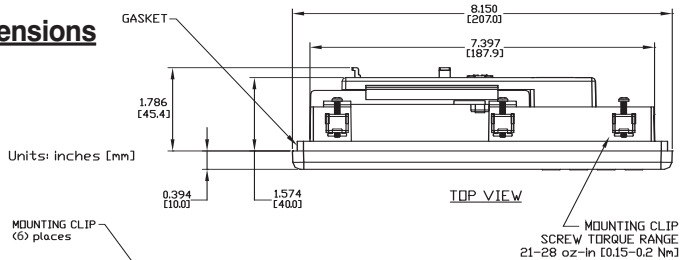
## 20-button Keypad Bezel

The 20-button keypad bezel can be used with both the touch and non-touch *C-more* 3" 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 (Style 3) 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* 3" Micro-Graphic panel. No panel configuration is required.

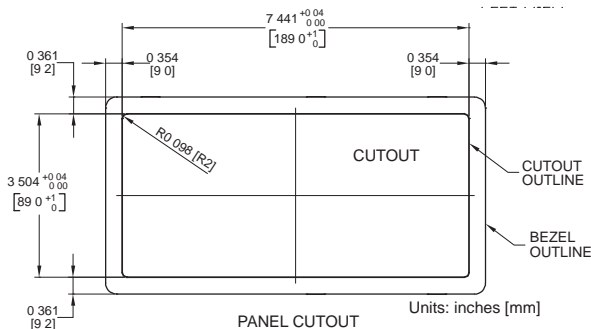
### EA-MG-BZ2



### Dimensions

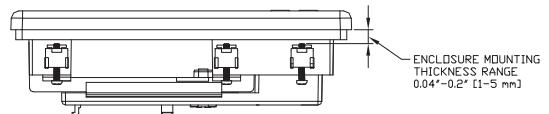


### Panel Cutout



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

### Panel Thickness



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

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:                                       |  |
| • <b>C-more Micro-Graphic Panels Supported</b> | EA1-S3ML, EA1-S3MLW, EA1-S3ML-N, EA1-S3MLW-N   |
| • <b>Connection</b>                            | Connects with expansion connector on the rear of the <b>C-more 3"</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. |
| • <b>Power Consumption</b>                     | None   |
| • <b>Keypad Button Life</b>                    | Minimum of 500,000 cycles  |
| • <b>Enclosure Mounting</b>                    | (6) mounting clips, EA-MG-BZ2-BRK, included.<br>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:                                 |  |
| • <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>Noise Immunity</b>                        | NEMA ICS3-304<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>Impulse 1000 V @ 1 µs pulse   |
| • <b>Enclosure</b>                             | NEMA 4/4X, IP-65 (When mounted correctly, for <b>indoor</b> use only.)   |
| • <b>Agency Approvals</b>                      | CE (EN61131-2), UL508, CUL Canadian C22.2 No. 142-M95, UL File E157382   |
| Physical:                                      |  |
| • <b>Dimensions</b>                            | 8.150" (W) x 4.225" (H) x 2.180" (D)<br>[207.0 mm x 107.3 mm x 55.4 mm]  |
| • <b>Weight</b>                                | 7.40 oz. [210 g]   |

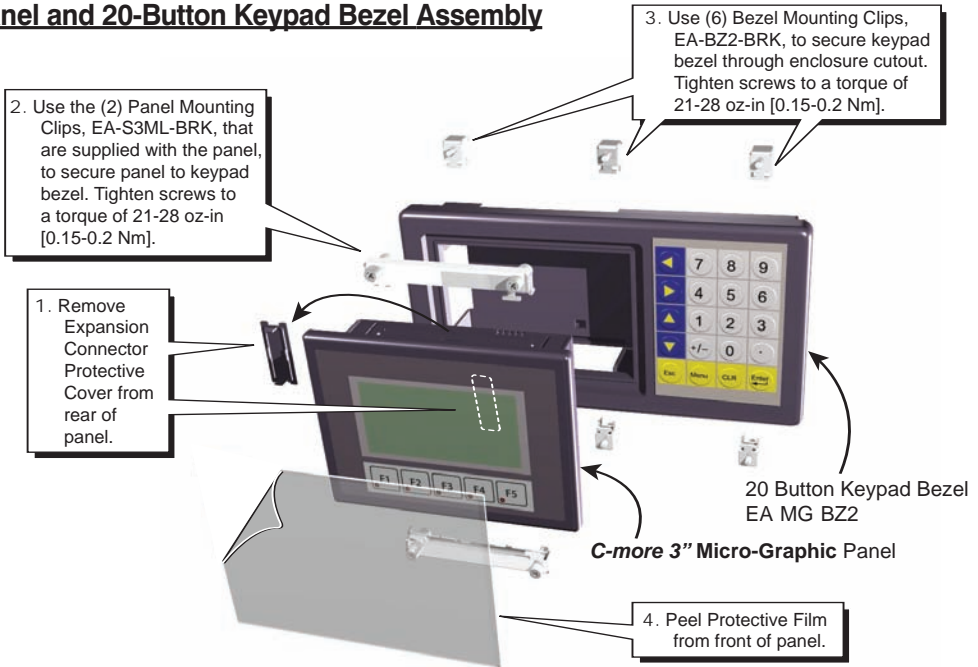
*C-more Micro-Graphic Panel being Installed in a 20-button Keypad Bezel EA-MG-BZ2*



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

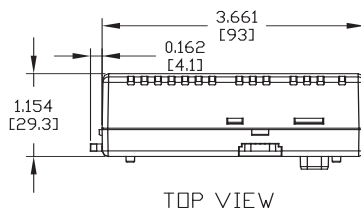
The *C-more* Micro-Graphic panel is designed to use the 5 VDC power that is available from an RJ12 serial communications port found on most *AutomationDirect* CLICK and *DirectLOGIC* PLC's. However, for other PLC brands that do not supply power through their serial communications port, the EA-MG-P1 DC 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* 3" Micro-Graphic panels is designed to easily snap on to the rear of a *C-more* 3" Micro-Graphic panel or the rear of an optional Keypad Bezel being used with a 3" Micro-Graphic panel.

### EA-MG-P1

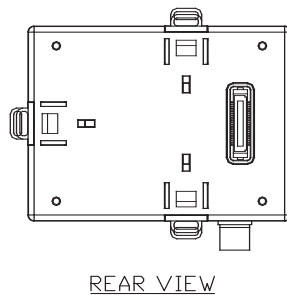
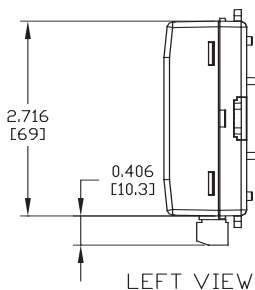
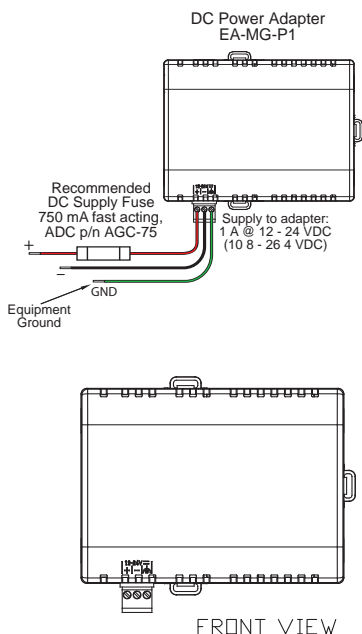


### Dimensions

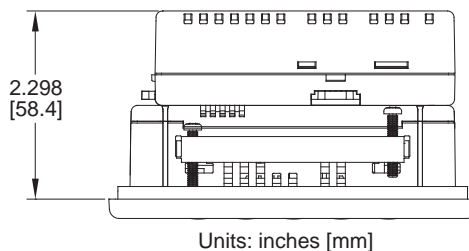
Units: inches [mm]



### 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                | NEMA ICS3-304<br>RFI, (145 MHz, 440 MHz 10 W @ 10 cm)<br>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)<br>[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.



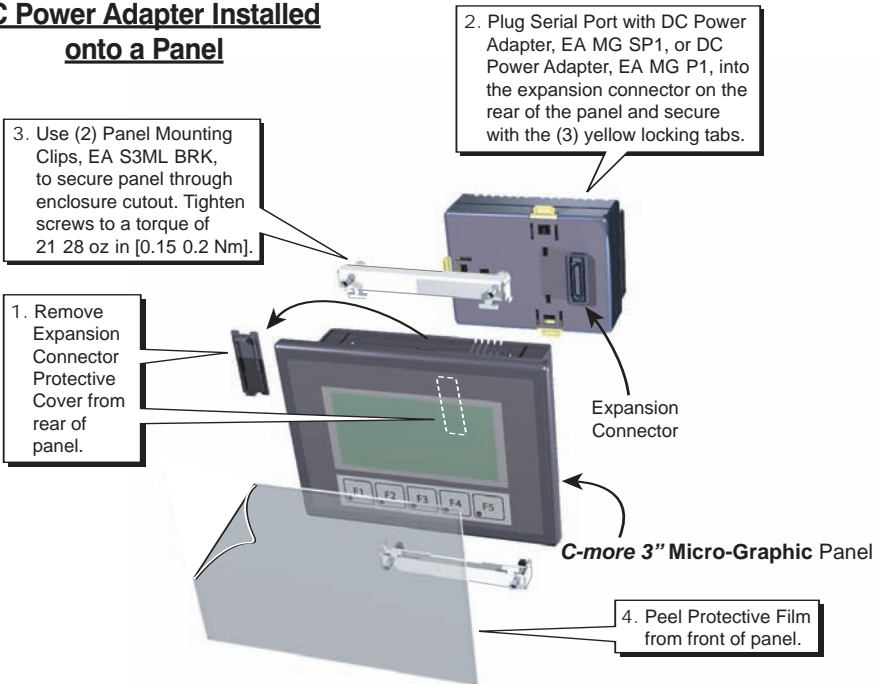
**NOTE:** If the adapter is installed on the panel, the adapter must be powered.

DC Power Adapter continued at top of next page.

## DC Power Adapter (cont'd)

### DC Power Adapter Installed onto a Panel

3



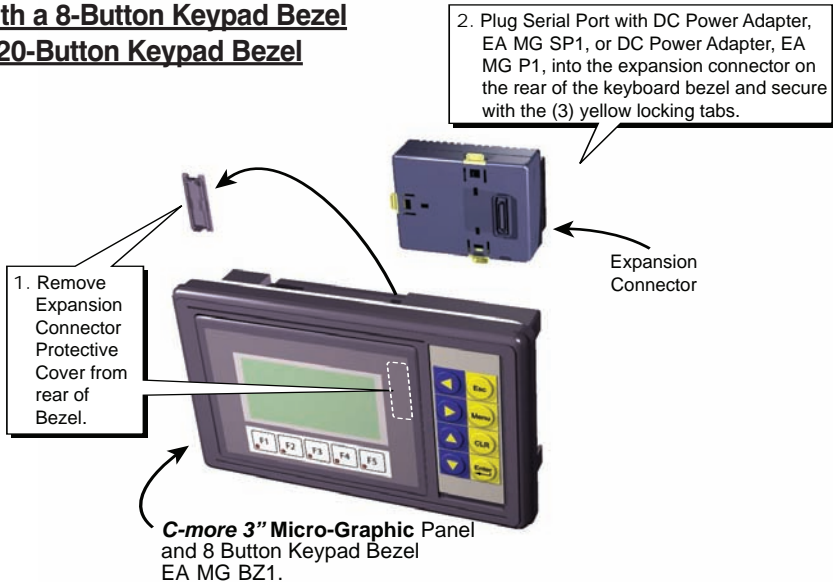
**NOTE:** Mounting clips for the panel are included with the panel.

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

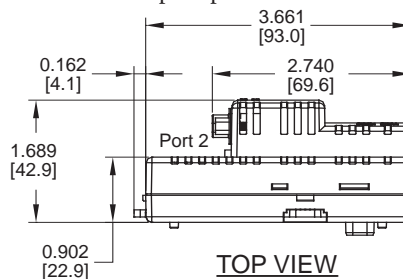
The *C-more* Micro-Graphic panel is designed to use the 5 VDC power that is available from an RJ12 serial communications port of most *AutomationDirect* CLICK and *DirectLOGIC* PLC's. However, for other PLC brands that do not supply power through their serial communications port, the EA-MG-P1 DC power 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* 3" Micro-Graphic panels is designed to easily snap on to the rear of a *C-more* 3" Micro-Graphic panel or the rear of an optional Keypad Bezel being used with a 3" Micro-Graphic panel.

### EA-MG-SP1

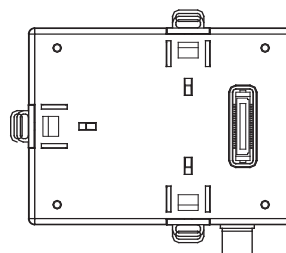
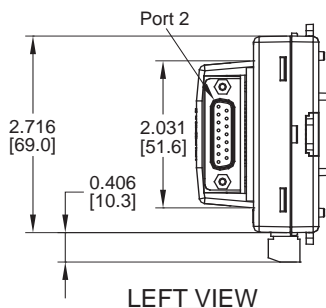
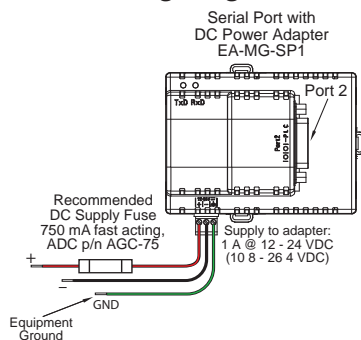


### Dimensions

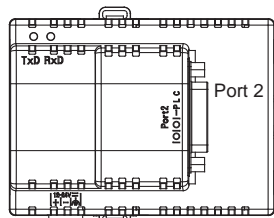
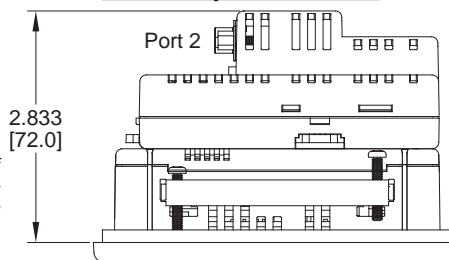
Units: inches [mm]



### Wiring Diagram



### Panel Overall Depth with Adapter Installed



**NOTE:** A minimum clearance of 12 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<br>(Dependent on PLC Protocol) | Baud rate: 9600, 19200 or 38400 bits/sec<br>Data bits: 7/8 bits<br>Parity: None, Odd/Even<br>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, 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   | NEMA ICS3-304<br>RFI, (145 MHz, 440 Mhz 10 W @ 10 cm)<br>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)<br>[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.

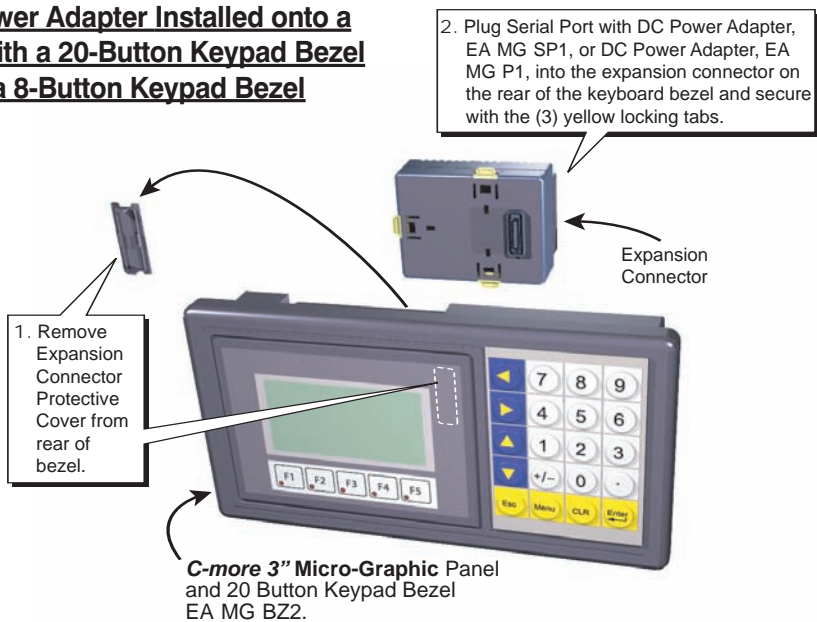


**NOTE:** If the DC power adapter is installed on the panel, the adapter must be powered.

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



**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.

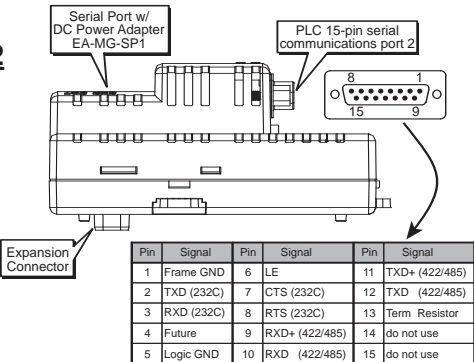
## Available PLC Protocols

## PLC Serial Communications Port 2

| PLC Drivers                 |  |
|-----------------------------|--|
| Serial - port1 or port2     | Serial - port2 only*                             |
| AutomationDirect CLICK      | Allen-Bradley DF1 Half Duplex                    |
| AutomationDirect K-sequence | Allen-Bradley DF1 Full Duplex                    |
| AutomationDirect DirectNET  | Allen-Bradley PLC5 DF1                           |
| AutomationDirect Modbus     | Allen-Bradley DH485                              |
| Modicon Modbus RTU          | GE SNFX (90/30, 90/70, Micro 90, VersaMax Micro) |
| Entivity Modbus RTU         | Mitsubishi FX                                    |
|                             | Mitsubishi Q & QnA                               |
|                             | 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

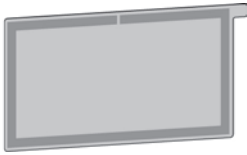


NOTE: Adapter requires 10.8-26.4 VDC supply.

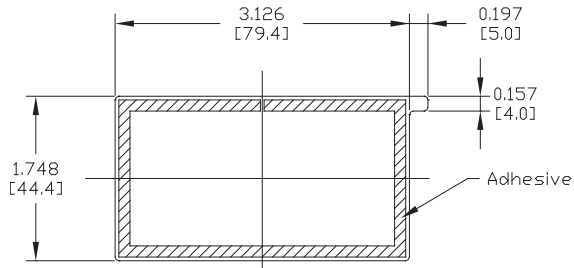
## Clear Screen Overlay

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

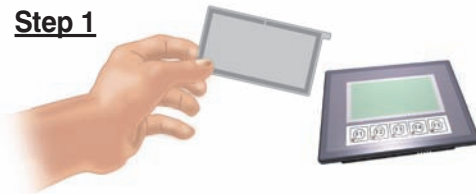


### Dimensions



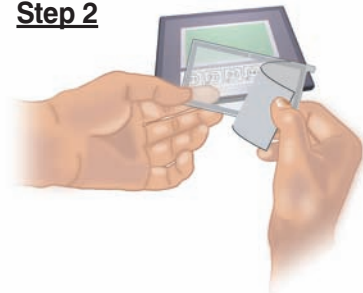
### Clear Screen Overlay Installation

#### 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.

4

The *C-more* 3" 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

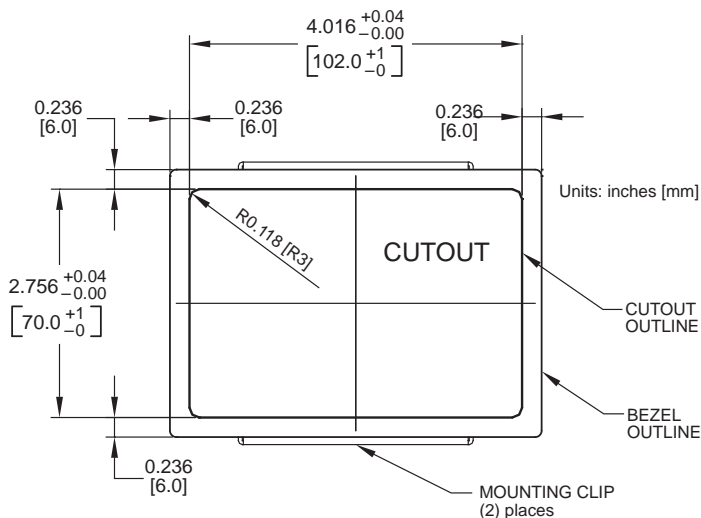


### 20-Button Keypad Bezel Mounting Clips EA-MG-BZ2-BRK

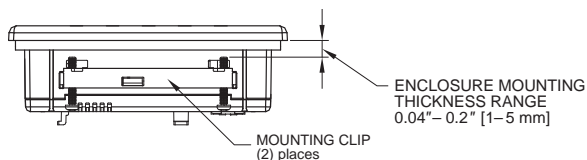


## Panel Cutout Dimensions (all models)

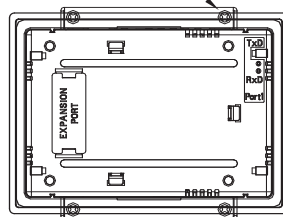
The *C-more 3"* panel is mounted into a cutout through the control cabinet and secured with two (2) mounting clips. The mounting clips are provided with the panel. There is a set of two (2) "T" shaped holes (slots) on each side of the panel's long dimension that the two tabs on each mounting clip will 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.

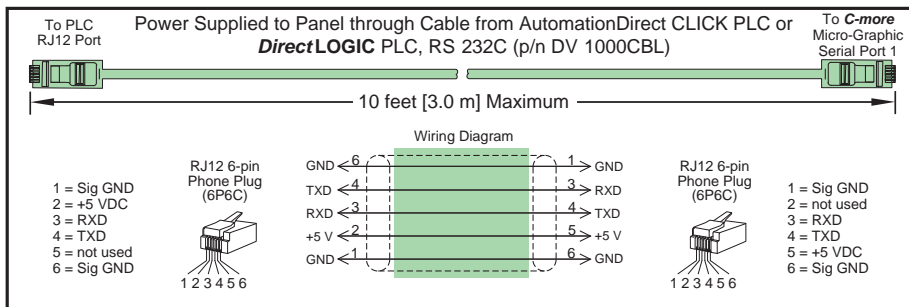
If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call us at 1-800-633-0405 or 770-844-4200.

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* CLICK or *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 3" 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 CLICK or *DirectLOGIC* PLC via Communications Cable

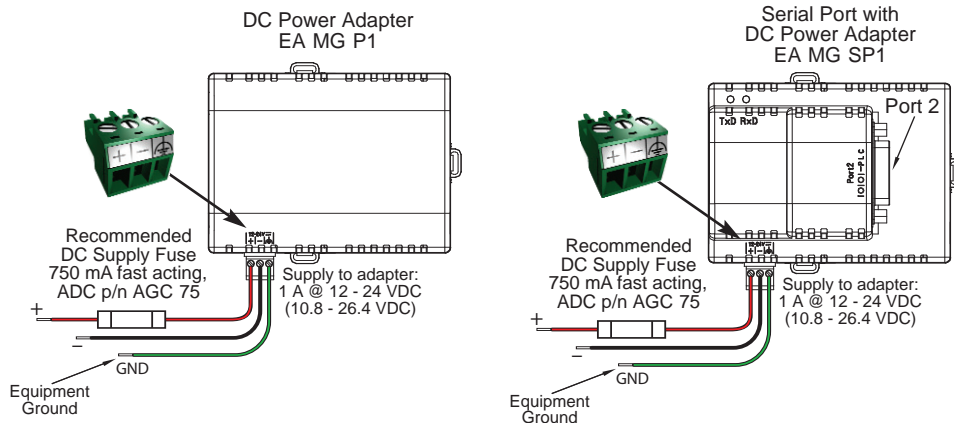


**NOTE:** Maximum cable length when the panel is powered via a CLICK or *DirectLOGIC* PLC is 10 feet.

Wiring Guidelines continued at top of the next page.

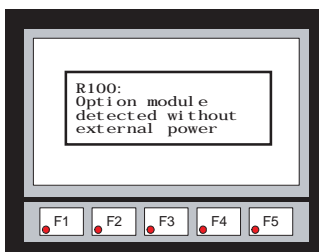
## Wiring Guidelines (cont'd)

### 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.

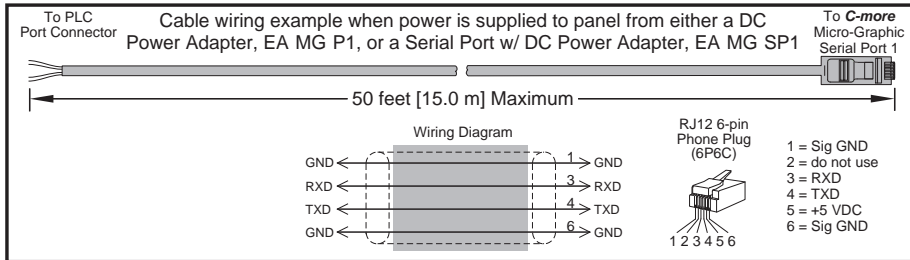
**NOTE:** If either the EA-MG-P1 DC Power Adapter or the EA-MG-SP1 Serial Port with DC Power Adapter is installed on the 3" Micro-Graphic panel, then the adapter must be powered. The error message below will be displayed on the panel if power is not applied. The RJ12 serial communications port (Port 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 AutomationDirect 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 is 50 ft. (15 m)**





# 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 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.

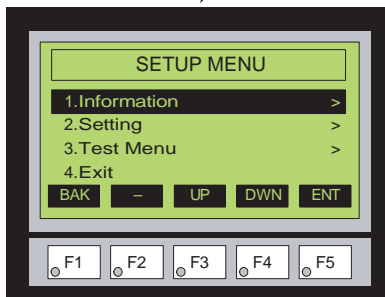
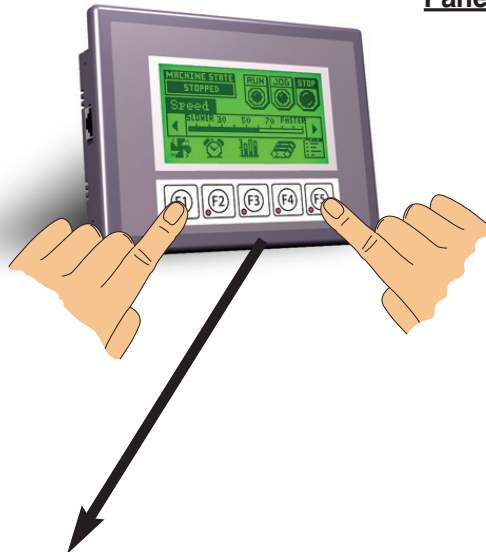


## Accessing the System Setup Screens

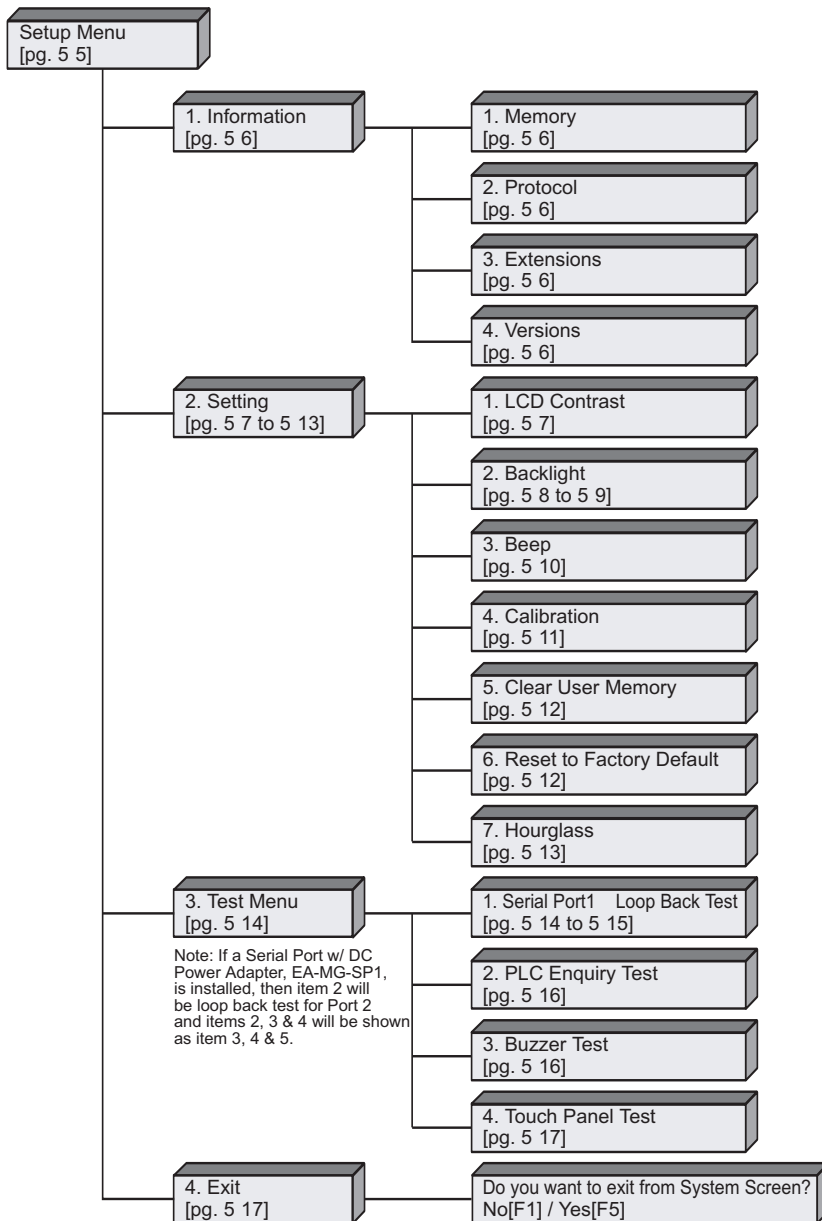
To access the Setup Menu of the panel System Setup Screens, press the panel's BAK [F1] and ENT [F5] function keys simultaneously for three (3) seconds as shown below. The System Setup Screens' Setup Menu will be displayed as shown at the bottom of this page.

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

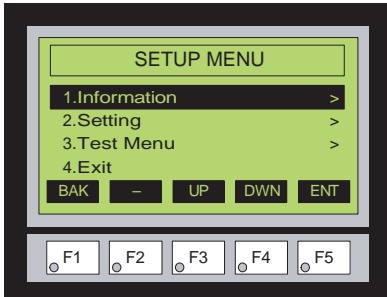
**C-more**  
**Micro-Graphic**  
**Panel**



# System Setup Screens Flowchart

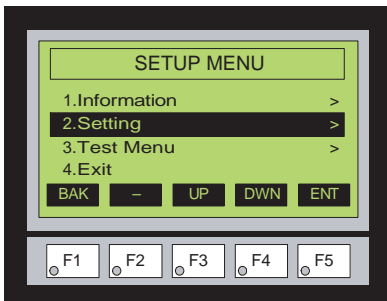


## Setup Menu

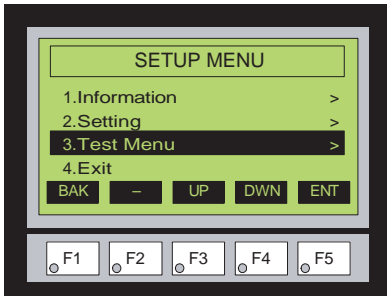


To navigate the different selections under the Setup Menu, use the function keys. BAK [F1] to return to the project screen or previous screen, UP [F3] to cursor up, DWN [F4] to cursor down, and ENT [F5] to enter a selection.

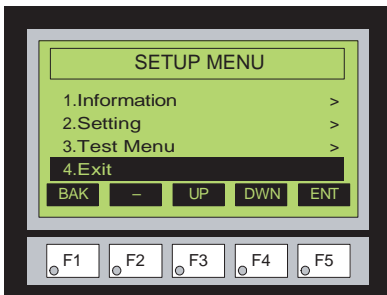
Pressing ENT [F5] with **Information** highlighted will take you to the **Information** menu screen. See page 5-6.



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

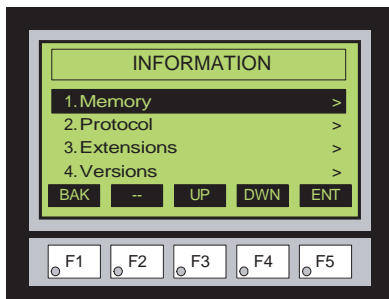


Pressing ENT [F5] with **Test Menu** highlighted will take you to the **Test Menu** screen. See page 5-12.

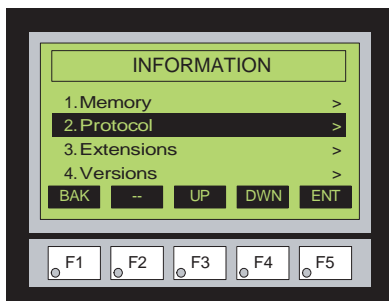
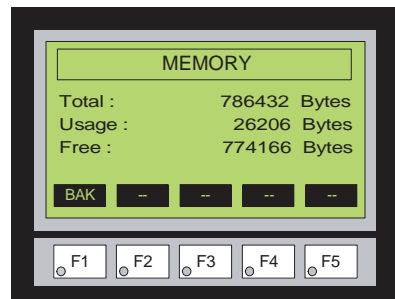


Pressing ENT [F5] with **Exit** highlighted will allow the user to decide whether to **Exit** or not **Exit** the System Setup Screens. See page 5-15.

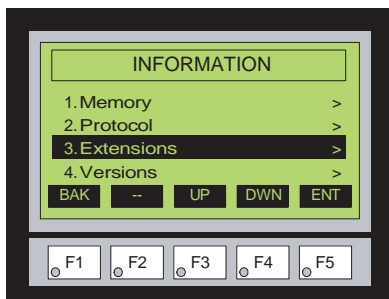
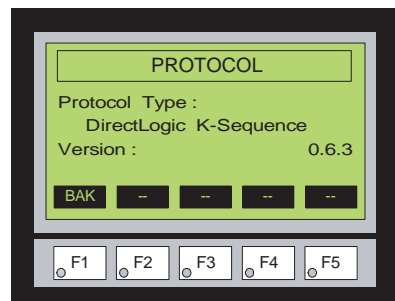
## Information Menu



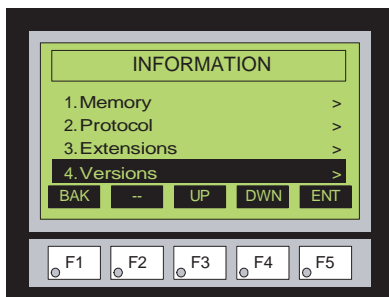
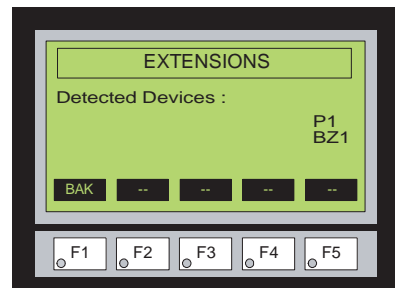
Pressing ENT [F5] with **Memory** highlighted will show the total memory available, memory usage and free memory available for the project.



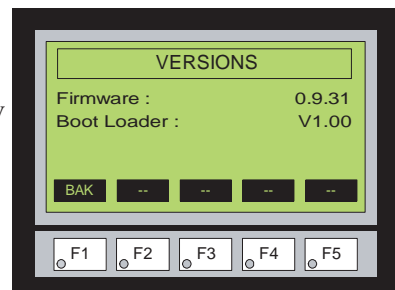
Pressing ENT [F5] with the **Protocol** highlighted will show the PLC Protocol that has been assigned to the panel and the protocol version.



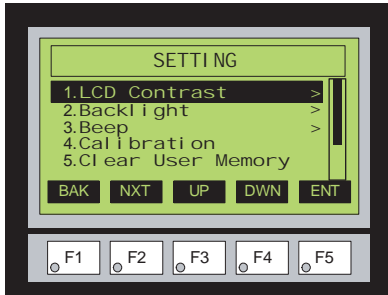
Pressing ENT [F5] with the **Extensions** highlighted will list the optional keypad bezel and/or DC power adapter that are installed on the panel. The example here shows the EA-MG-P1 & EA-MG-BZ1.



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

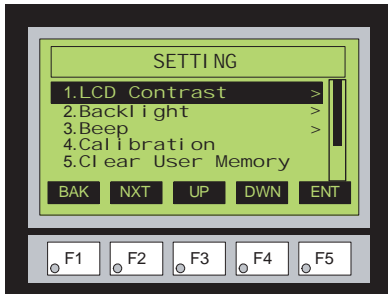
**Clear User Memory** – page 5-11

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

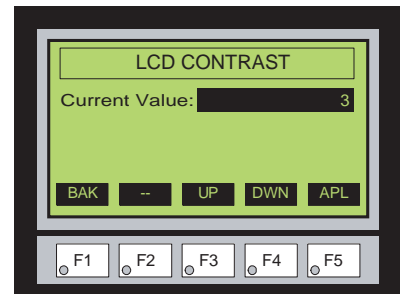
**Hourglass** – page 5-13



## Setting – LCD Contrast



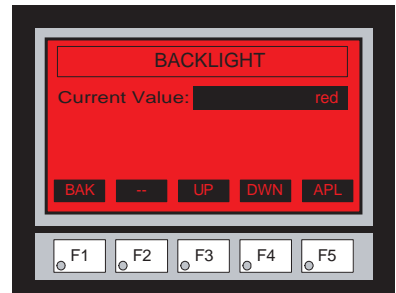
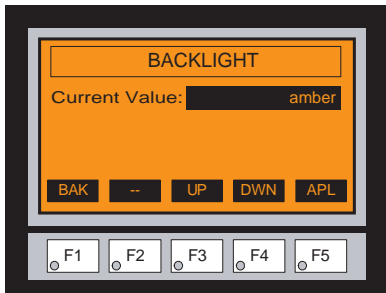
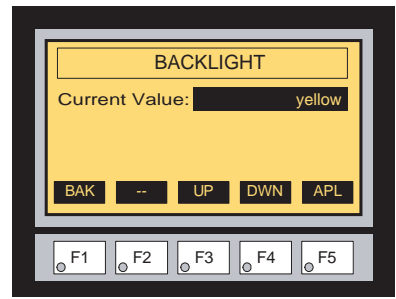
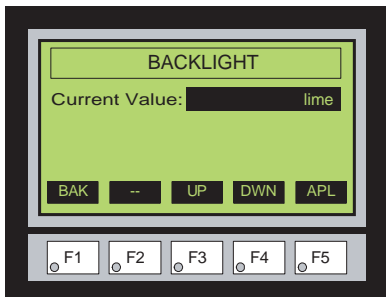
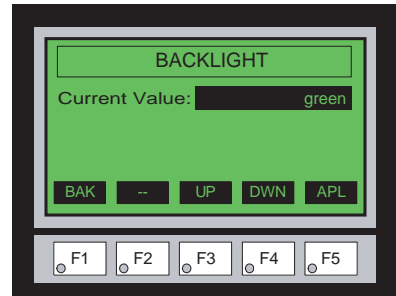
With **LCD Contrast** highlighted, press ENT [F5] to bring up the screen showing the current value. The default is a value of 3. The contrast can be adjusted between 1 to 5, with 1 being the least amount of contrast and 5 being the highest amount.



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

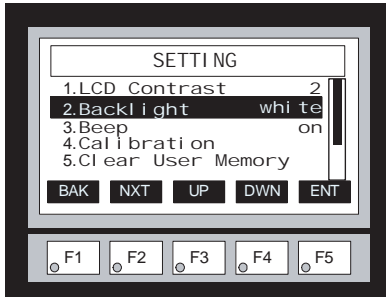


With Backlight highlighted, press ENT [F5] to bring up the screen showing the current backlight screen color. The default is green. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (green, lime, yellow, amber and red). Use the APL [F5] function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

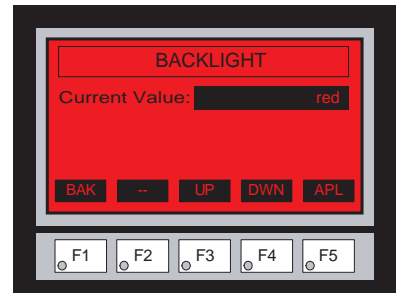
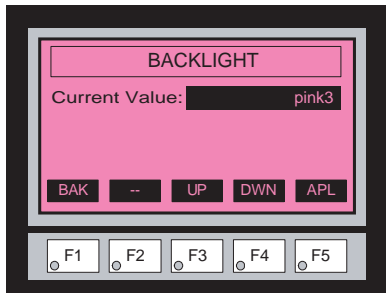
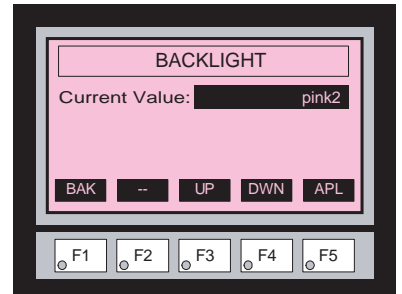
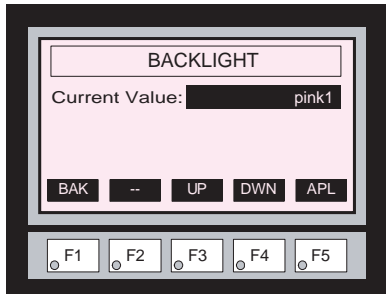
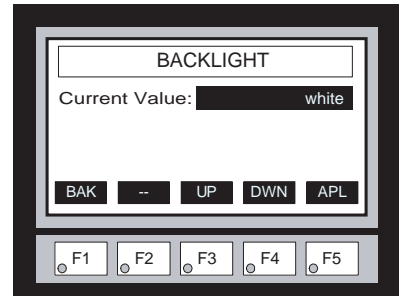


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

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

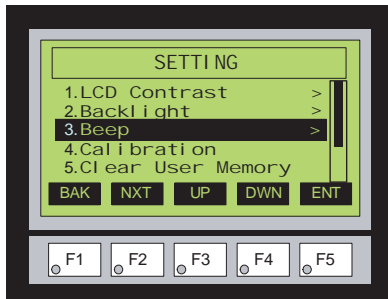


With Backlight highlighted, press ENT [F5] to bring up the screen showing the current backlight screen color. The default is white. The UP [F3] and DWN [F4] function keys can be used to scroll through the five available backlight colors (white, pink1, pink2, pink3 and red). Use the APL [F5] function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

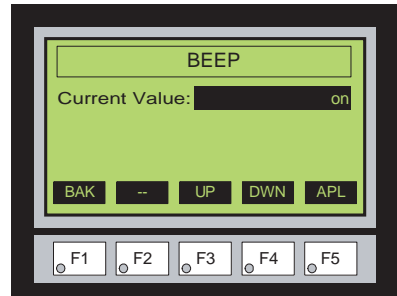


**Note:** Loading a project to the panel will override whatever color is chosen from the System Setup Screens' Backlight color selection screen. The selected color is displayed only when in the System Setup Screens.

## Setting – Beep



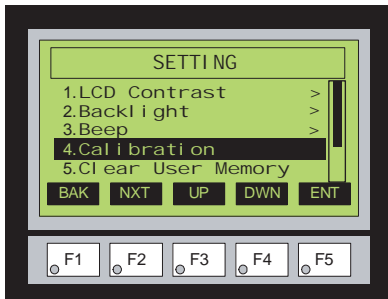
With Beep highlighted, press ENT [F5] to show the current value for the internal beeper. The default is ON. The UP [F3] and DWN [F4] function keys can be used to toggle between the ON and OFF state for the beeper (enable or disable). Use the APL [F5] function key to apply the selection.



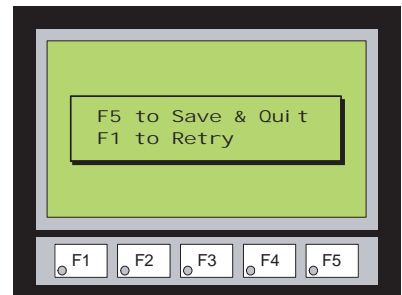
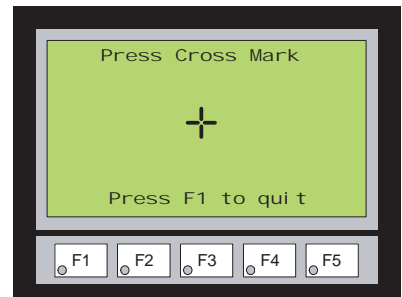
**Note:** Loading a project to the panel will override whatever selection is chosen for the beeper from the System Setup Screens' Beep on/off selection screen. The Beep on/off choice can be changed through the System Setup Screens after a project is loaded.



## Setting – Calibration

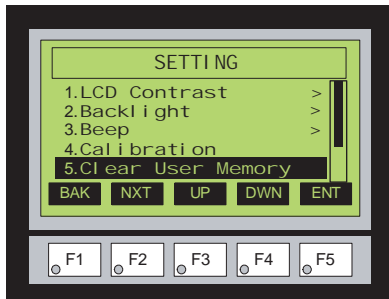


With Calibration highlighted, press ENT [F5] to bring up the first calibration screen as shown on the right. Touch the “cross” in the upper left corner as accurately as you can. When the screen is touched, the cross will move to the lower right corner and finally to the center of the screen. If the touch 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.

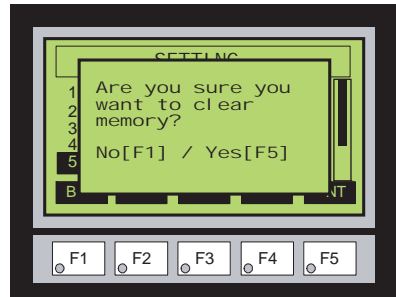


5

## Setting – Clear User Memory



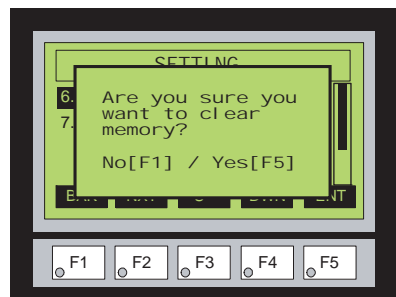
With Clear User Memory highlighted, press ENT [F5]. You will be given the choice to either proceed with clearing the user memory by pressing [F5] for YES or allowed to cancel by pressing [F1] for NO.



## 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.

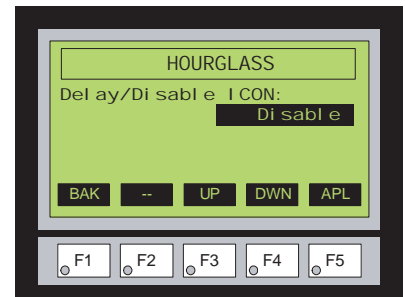
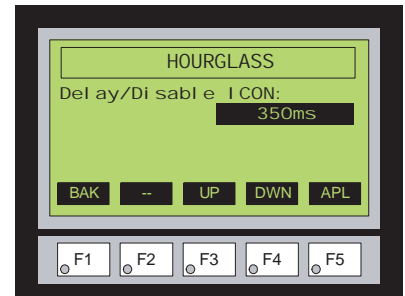
## Setting – Hourglass



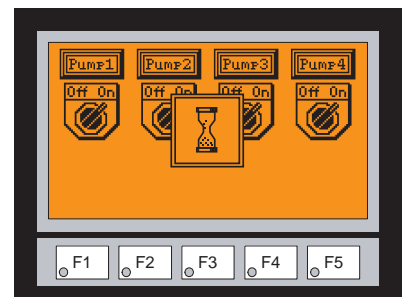
The **Hourglass** selection listed under the **Setting** menu can be used to either disable the display of the hourglass icon or set the amount of delay time (0 ms to 1000 ms) desired before it is displayed.

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.

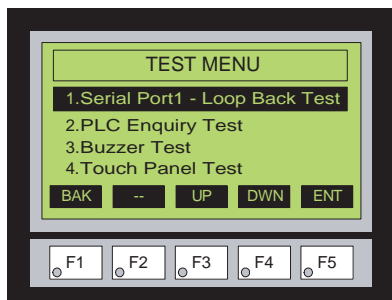
**Explanation:** An hourglass icon is displayed on the panel anytime a new screen is being loaded until communication is established with the new screen. If communication is established before the set delay time has timed out, no hourglass will be displayed. The hourglass icon can also be disabled from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

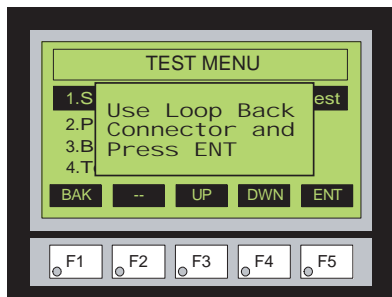
Serial Port2 - Loop Back Test – page 5-14

PLC Enquiry Test – page 5-15

Buzzer Test – page 5-15

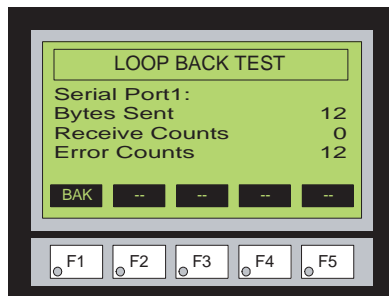
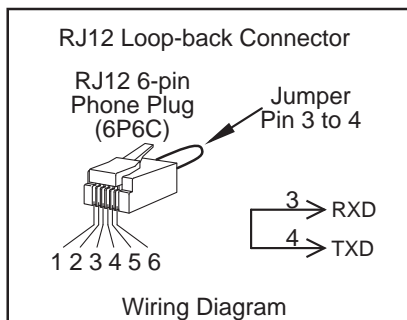
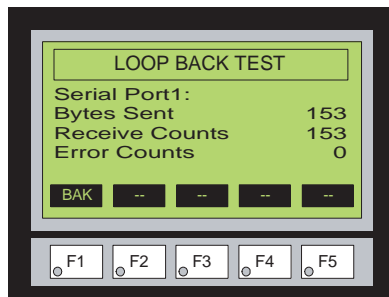
Touch Panel Test – page 5-17

## Test Menu – Serial Port1 - Loop Back Test

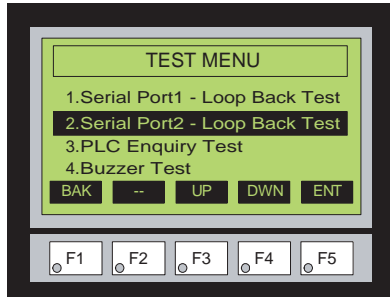


With Serial Port1 - Loop Back Test highlighted, press ENT [F5] to bring up the screen shown to the left. Connect a loop back connector

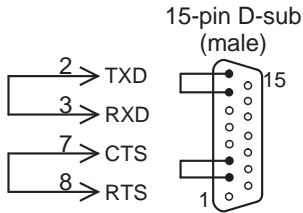
constructed as shown here and press ENT [F5] to start the test. If the test is passing, the **Receive Counts** will equal the **Bytes Sent**. If the serial port is not working, then the **Error Counts** will equal the **Bytes Sent**. The test will continue until the BAK [F1] key is pressed.



## Test Menu – Serial Port2 - Loop Back Test

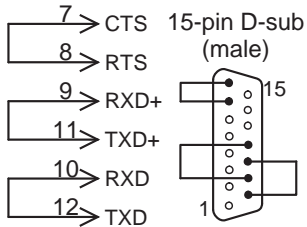


RS-232 Loop-back Connector



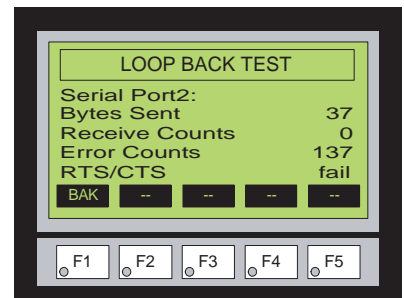
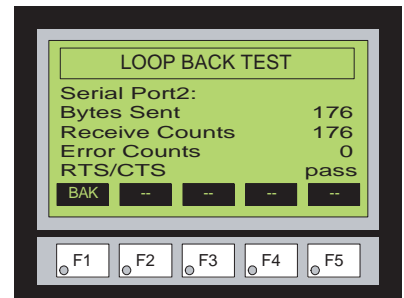
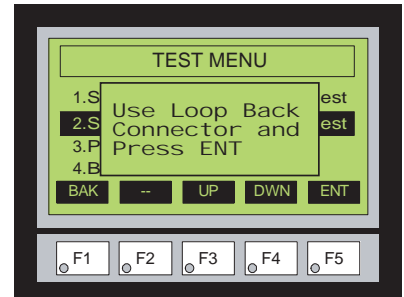
Wiring Diagram

RS-422/485 Loop-back Connector

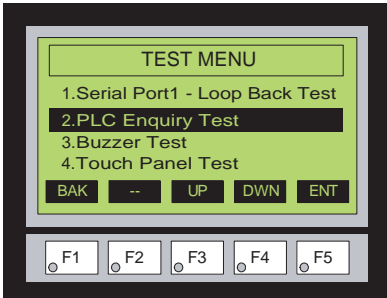


Wiring Diagram

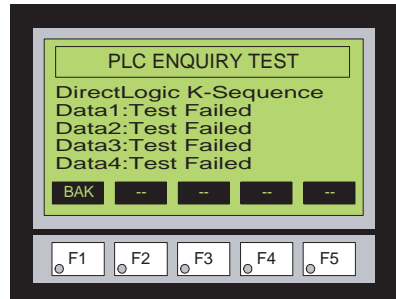
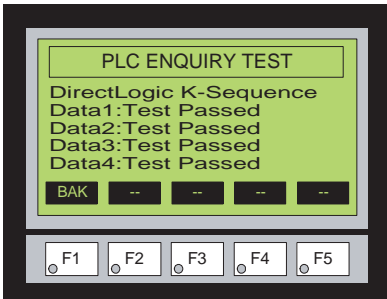
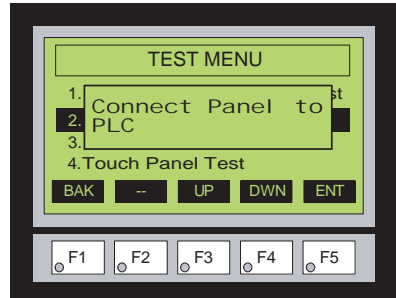
If the EA-MG-SP1 Serial Port with DC Power Adapter module is installed on the panel, then the screen to the left will be displayed when the Test Menu is brought up. With **Serial Port2 - Loop Back Test** selection highlighted, press ENT [F5] to bring up the screen shown to the right. At this point, either 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.



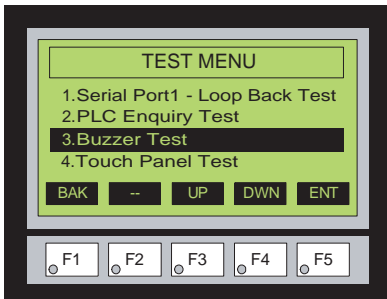
## Test Menu – PLC Enquiry Test



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

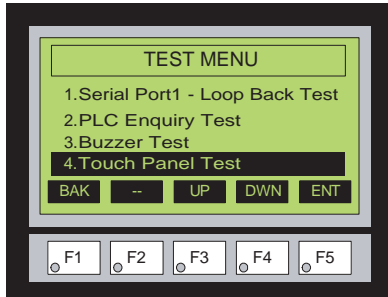


With Buzzer Test highlighted, press ENT [F5] to run the test on the internal audible beeper. The beeper will sequence up the scale through eight notes and then start over. The BAK [F1] key can be pressed to cancel the test.



**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

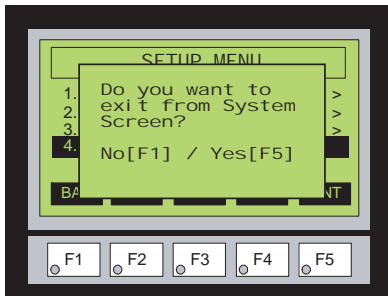


With Touch Panel Test highlighted, press ENT [F5] to bring up the screen shown to the right. Touch any area of the screen to visualize the active area of the touch screen. If the touch panel area is working properly, the screen will blacken at the area touched. Use this test to identify any area that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

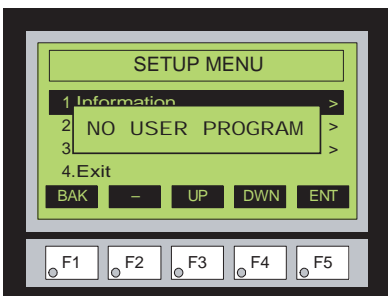


**Note:** The Touch Panel Test is available only on C-more Micro Graphic Touch panels (models EA1-S3ML and EA1-S3MLW).

## 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

## In This Chapter...

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## Introduction

The *C-more*<sup>®</sup> Micro-Graphic panels are capable of communicating with AutomationDirect CLICK and 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 CLICK, DL05, DL06, DL105, DL205, D3-350 and DL405 CPUs, your cabling choices are fairly simple.

- DV-1000CBL – connects to CLICK, 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

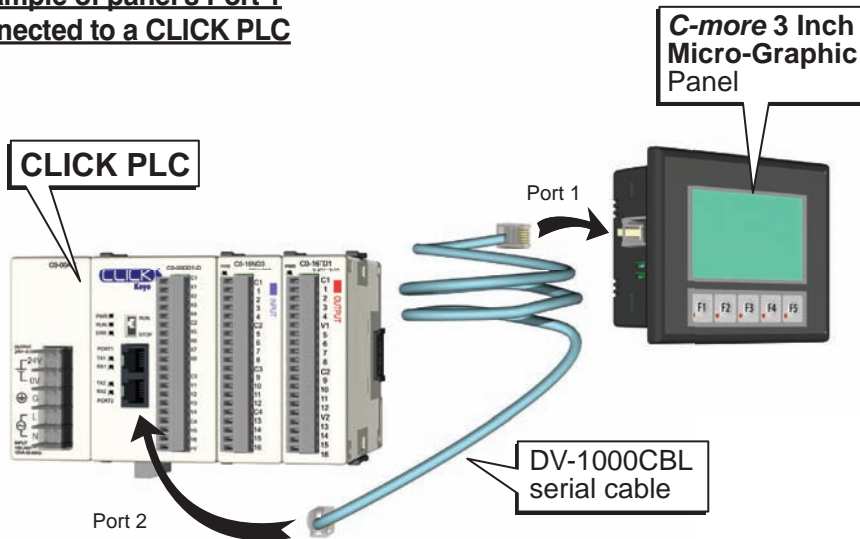
If you have difficulty determining whether the particular PLC and/or protocol you are using will work with the *C-more* series of Micro-Graphic panels, please contact our technical support group at 770-844-4200.

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

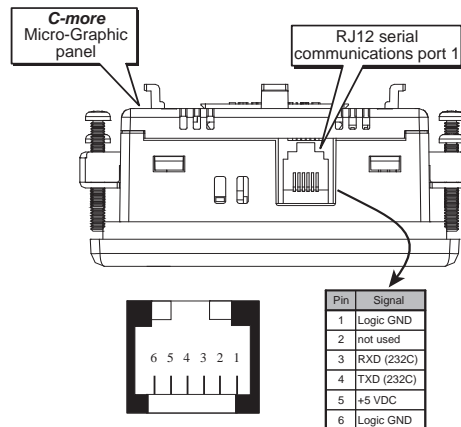
\*Note: Use of serial port2 on C-more 3" Micro-Graphic requires the use of EA-MG-SP1

## C-more Micro-Graphic Built-in Port 1

Example of panel's Port 1  
connected to a CLICK PLC

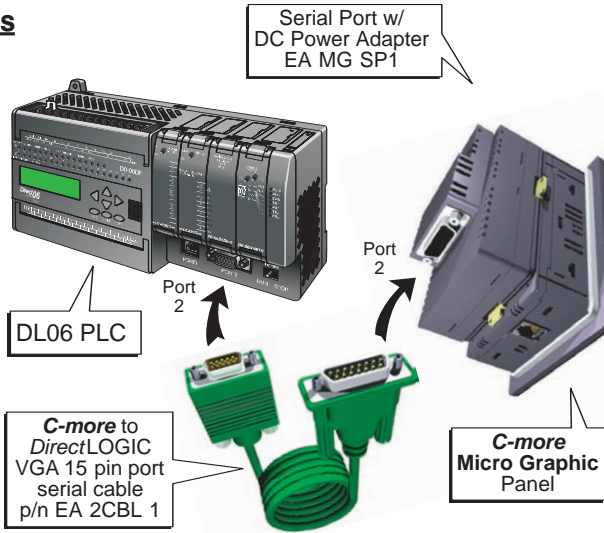


### Port 1 (built-in)

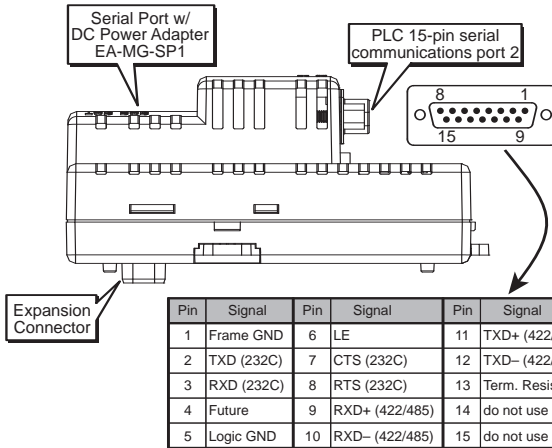


# C-more Micro-Graphic Optional EA-MG-SP1 Port 2

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



## Port 2 (optional)



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 *C-more* 3" Micro-Graphic panels and a variety of PLCs. The charts list which PLC ports can communicate and provide power to the *C-more* Micro-Graphic panel through built-in port 1 (RS-232). Also shown is communication through port 1 (RS-232) when utilizing the optional DC Power Adapter EA-MG-P1. Communications using the optional Serial Port with DC Power Adapter (EA-MG-SP1) through port 1 or port 2 is illustrated as well.

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.

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. The constructed cables are referred to as Diagram 1 through 13 and start on page 6-32.

### AutomationDirect CLICK PLC:

AutomationDirect's practically free PLC, CLICK, can be used with RS-232 2-wire networks. *C-more* Micro-Graphic panels are an ideal partner for CLICK which:

- Is low cost
- Is easy to use
- Standard Modbus communication
- Is programmed by free CLICK programming software
- Has comm ports that provide 5 VDC
- Communicates at speeds up to 115.2 Kbps, although the maximum communication speed between a CLICK PLC and a *C-more* Micro-Graphic panel is 38.4 Kbps.



**Note:** *Only one C-more Micro-Graphic panel can be powered by a CLICK PLC. If a 2nd panel is connected to a different port on the CLICK PLC, an external power supply is required.*

### 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.

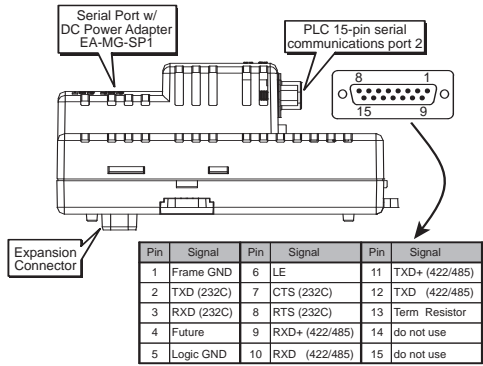
### Allen-Bradley:

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<br>RJ12 - 6 pin    | K-sequence  | DV-1000CBL<br>RS-232              | K-sequence   | DV-1000CBL<br>RS-232              |
|                          | D2-240   | Port 1<br>RJ12 - 6 pin    | K-sequence  | DV-1000CBL<br>RS-232              | K-sequence   | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>RJ12 - 6 pin    | K-sequence,<br><i>DirectNET</i>   |                                   | K-sequence,<br><i>DirectNET</i>  |                                   |
|                          | D2-250-1 | Port 1<br>RJ12 - 6 pin    | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                                     | DV-1000CBL<br>RS-232              | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                              | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>DB15HD (female) |   | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |
|                          | D2-260   | Port 1<br>RJ12 - 6 pin    | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                                     | DV-1000CBL<br>RS-232              | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                              | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>DB15HD (female) |   | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |

## AutomationDirect CLICK PLC

## DirectLOGIC DL05, DL06, D0-DCM Module &amp; 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 |
| AutomationDirect CLICK | all versions | Port 1<br>RJ12 - 6 pin    | Modbus (CLICK)  | DV-1000CBL<br>RS-232      | Modbus (CLICK)   | DV-1000CBL<br>RS-232      |
| DirectLOGIC DL05       | all versions | Port 1<br>RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL<br>RS-232      | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | DV-1000CBL<br>RS-232      |
|                        |              | Port 2<br>RJ12 - 6 pin    |   |                           |  |                           |
|                        | D0-DCM       | Port 1<br>RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL<br>RS-232      | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | DV-1000CBL<br>RS-232      |
|                        |              | Port 2<br>DB15HD (female) |   |                           |  |                           |
| DirectLOGIC DL06       | all versions | Port 1<br>RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL<br>RS-232      | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | DV-1000CBL<br>RS-232      |
|                        |              | Port 2<br>DB15HD (female) |   |                           |  |                           |
|                        | D0-DCM       | Port 1<br>RJ12 - 6 pin    | K-sequence,<br>DirectNET,<br>Modbus RTU   | DV-1000CBL<br>RS-232      | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | DV-1000CBL<br>RS-232      |
|                        |              | Port 2<br>DB15HD (female) |   |                           |  |                           |
| DirectLOGIC DL105      | all versions | Port 1<br>RJ12 - 6 pin    | K-sequence  | DV-1000CBL<br>RS-232      | K-sequence   | DV-1000CBL<br>RS-232      |



## AutomationDirect CLICK PLC

## DirectLOGIC DL05, DL06, D0-DCM Module &amp; 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  |
| AutomationDirect CLICK               | all versions | Port 1 RJ12 - 6 pin    | Modbus (CLICK)   | DV-1000CBL RS-232           | Modbus (CLICK)                                   | EA-2CBL RS-232   |
| 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    |  |                             |  |  |
|                                      | D0-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<br>* See Diagram 1 RS-422<br>* See Diagram 2 RS-485 Modbus only |
| Direct LOGICDL06                     | 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 DB15HD (female) |  | DV-1000CBL + FA-15HD RS-232 | Modbus RTU                                       | EA-2CBL-1 RS-232<br>* See Diagram 1 RS-422<br>* See Diagram 2 RS-485 Modbus only |
|                                      | D0-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<br>* See Diagram 1 RS-422<br>* See Diagram 2 RS-485 Modbus only |
| DirectLOGIC DL105                    | all versions | Port 1 RJ12 - 6 pin    | K-sequence   | DV-1000CBL RS-232           | K-sequence                                       | EA-2CBL RS-232   |

\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

## 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         |
| <b>DirectLOGIC DL205</b> | D2-230   | Port 1<br>RJ12 - 6 pin          | K-sequence  | DV-1000CBL<br>RS-232              | K-sequence   | DV-1000CBL<br>RS-232              |
|                          | D2-240   | Port 1<br>RJ12 - 6 pin          | K-sequence  | DV-1000CBL<br>RS-232              | K-sequence   | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>RJ12 - 6 pin          | K-sequence,<br><i>DirectNET</i>   |                                   | K-sequence,<br><i>DirectNET</i>  |                                   |
|                          | D2-250-1 | Port 1<br>RJ12 - 6 pin          | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                                     | DV-1000CBL<br>RS-232              | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                              | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>DB15HD<br>(female)    |   | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |
|                          | D2-260   | Port 1<br>RJ12 - 6 pin          | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                                     | DV-1000CBL<br>RS-232              | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                              | DV-1000CBL<br>RS-232              |
|                          |          | Port 2<br>DB15HD<br>(female)    |   | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |
|                          | D2-DCM   | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                                     | * See Diagram 3<br>RS-232         | K-sequence,<br><i>DirectNET</i> ,<br>Modbus RTU                              | * See Diagram 3<br>RS-232         |
|                          | WINPLC   | Port 1<br>RJ12 - 6 pin          | Modbus RTU  | DV-1000CBL<br>RS-232              | Modbus RTU   | DV-1000CBL<br>RS-232              |

\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

## 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<br>RJ12 - 6 pin          | K-sequence   | DV-1000CBL<br>RS-232              | K-sequence                                       | EA-2CBL<br>RS-232         |
|                                      | D2-240   | Port 1<br>RJ12 - 6 pin          | K-sequence   | DV-1000CBL<br>RS-232              | K-sequence                                       | EA-2CBL<br>RS-232         |
|                                      |          | Port 2<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET   |                                   | K-sequence,<br>DirectNET                         |                           |
|                                      | D2-250-1 | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU  | DV-1000CBL<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU          | EA-2CBL<br>RS-232         |
|                                      |          | Port 2<br>DB15HD<br>(female)    |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | EA-2CBL-1<br>RS-232       |
|                                      |          |                                 |  |                                   |  | * See Diagram 1<br>RS-422 |
|                                      | D2-260   | Port 1<br>RJ12 - 6 pin          | K-sequence,<br>DirectNET,<br>Modbus RTU  | DV-1000CBL<br>RS-232              | K-sequence,<br>DirectNET,<br>Modbus RTU          | EA-2CBL<br>RS-232         |
|                                      |          | Port 2<br>DB15HD<br>(female)    |  | DV-1000CBL<br>+ FA-15HD<br>RS-232 |  | EA-2CBL-1<br>RS-232       |
|                                      |          |                                 |  |                                   | * See Diagram 1<br>RS-422                        |                           |
|                                      | D2-DCM   | Port 1<br>DB 25 pin<br>(female) | K-sequence,<br>DirectNET,<br>Modbus RTU  | * See Diagram 3<br>RS-232         | DirectNET  | EA-4CBL-2<br>RS-232       |
|                                      |          |                                 |  |                                   |  | * See Diagram 6<br>RS-422 |
|                                      | WINPLC   | Port 1<br>RJ12 - 6 pin          | Modbus RTU   | DV-1000CBL<br>RS-232              | Modbus RTU                                       | EA-2CBL<br>RS-232         |

\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

## 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<br>DL305 | D3-330 or<br>D3-340   | D3-232-DCU<br>DB 25 pin<br>(female) | Not Possible  |                           | DirectNET  | * See Diagram 3<br>RS-232 |
|                      |                       | D3-422-DCU<br>DB 25 pin<br>(female) | Not Possible  |                           | Not Possible   |                           |
|                      | D3-340                | Port 1<br>RJ11 - 4 pin              | Not Possible  |                           | DirectNET  | OP-3CBL-1<br>RS-232       |
|                      |                       | Port 2<br>RJ11 - 4 pin              | Not Possible  |                           | DirectNET,<br>Modbus RTU   |                           |
|                      | D3-350                | Port 1<br>RJ12 - 6 pin              | K-sequence,<br>DirectNET  | DV-1000CBL<br>RS-232      | K-sequence,<br>DirectNET   | DV-1000CBL<br>RS-232      |
|                      |                       | Port 2<br>DB 25 pin<br>(female)     | Not Possible  |                           | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | * See Diagram 3<br>RS-232 |
|                      | D3-DCM<br>D3-350 only | Port 1<br>DB 25 pin<br>(female)     | K-sequence,<br>DirectNET,<br>Modbus RTU   | * See Diagram 3<br>RS-232 | K-sequence,<br>DirectNET,<br>Modbus RTU                                      | * See Diagram 3<br>RS-232 |

\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

## 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                  |                        |  |
| DirectLOGIC DL305                    | D3-330 or D3-340  | D3-232-DCU DB 25 pin (female) | DirectNET  | * See Diagram 3 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<br>* 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<br>* See Diagram 6 RS-422 |                        |  |
|                                      |   |                               |  |                           |  |  |                        |  |
|                                      | * Note: Wiring Diagrams for user constructed cables start on page 6-32. |                               |  |                           |  |  |                        |  |

## 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<br>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<br>DB 25 pin (female) | Not Possible  |   | K-sequence, <i>DirectNET</i>   | DV-1000CBL & FA-CABKIT RS-232               |
|                   | D4-440 | Port 0<br>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<br>DB 25 pin (female) | Not Possible  |   | K-sequence, <i>DirectNET</i>   | DV-1000CBL & FA-CABKIT RS-232               |
|                   | D4-450 | Port 0<br>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<br>DB 25 pin (female) | Not Possible  |   | K-sequence, <i>DirectNET</i> , Modbus RTU                                    | DV-1000CBL & FA-CABKIT RS-232               |
|                   |        | Port 3<br>DB 25 pin (female) | Not Possible  |   | Not Possible   |   |
|                   |        | Port 2<br>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<br>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 6-32.

## 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, <i>DirectNET</i>   | DV-1000CBL & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i>                     | EA-4CBL-2 RS-232<br>* 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, <i>DirectNET</i>   | DV-1000CBL & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i>                     | EA-4CBL-2 RS-232<br>* 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, <i>DirectNET</i> , Modbus RTU  | DV-1000CBL & FA-CABKIT RS-232               | K-sequence, <i>DirectNET</i> , Modbus RTU        | EA-4CBL-2 RS-232<br>* See Duagram 4 RS-422 |
|   |        | Port 3 DB 25 pin (female) | Not Possible   |   | K-sequence, <i>DirectNET</i> , Modbus RTU        | * See Diagram 5 RS-422                     |
|   |        | Port 2 RJ12 - 6 pin       | K-sequence, <i>DirectNET</i>   | DV-1000CBL RS-232                           | K-sequence, <i>DirectNET</i>                     | EA-2CBL RS-232                             |
|   | D4-DCM | Port 1 DB 25 pin (female) | K-sequence, <i>DirectNET</i> , Modbus RTU  | * See Diagram 3 RS-232                      | <i>DirectNET</i>                                 | EA-4CBL-2 RS-232<br>* See Diagram 6 RS-422 |
|   |        |                           |  |   |  |  |
| * Note: Wiring Diagrams for user constructed cables start on page 6-32. |        |                           |  |   |  |  |

## Allen-Bradley 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 |
| Allen-Bradley MicroLogix   | 1000, 1100, 1200, 1500               | 8-pin mini-din port<br>RJ45 8-pin phone plug | Not Possible  | Not Possible              | Not Possible   | Not Possible              |
| Allen-Bradley SLC500       | 5/03, 5/04, 5/05<br>5/01, 5/02, 5/03 | 9-pin D-sub port<br>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<br>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 & 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   |                           |  |
|                                      | 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  | PLC 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 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            |
|  | Q / QnA  | 9-pin D-sub port         |   |                           |  | Q / QnA                   | ** See Diagram 14 RS-232C        |
|  |  | 6-pin mini-din port      |   |                           |  |                           | ** See Diagram 15 RS-232C        |
| 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 6-32. |  |                          |   |                           |  |                           |                                  |

\*\* Note: Wiring Diagrams for user constructed cables start on page 6-32.

## Available Purchased Cables

| Cable Description   | Cable Part No.    |
|---|-------------------|
| <b>Cables for direct connect to panel's serial port 1<br/>(Panel powered from PLC's serial port.)</b>   |                   |
| AutomationDirect CLICK PLC, <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)<br>Use with DV-1000CBL cable.   | <b>FA-15HD</b>    |
| <b>Direct</b> LOGIC PLC 15-pin D-sub port, DL405 (RS-232C).<br>Use with DV-1000CBL cable.   | <b>FA-CABKIT</b>  |
| <b>Cables for direct connect to panel's serial port 1<br/>(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<br/>(Panel powered from optional Serial Port w/ DC Power Adapter, EA-MG-SP1.)</b>    |                        |
| AutomationDirect CLICK PLC, <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. 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



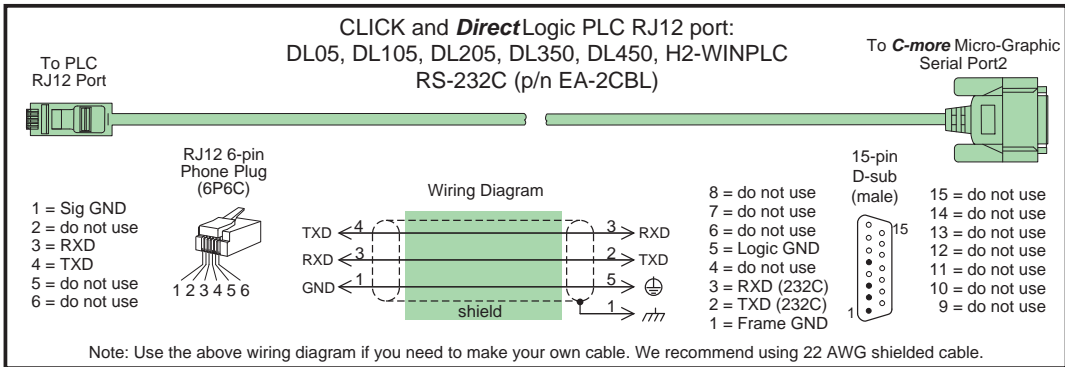
Part No. EA-OMRON-CBL

# 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.

## CLICK & *Direct*LOGIC:

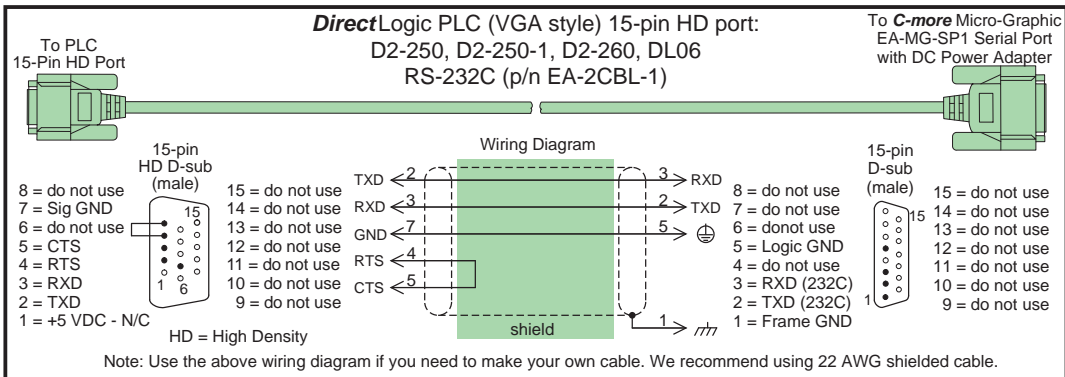
## EA-2CBL



**Note:** Only one *C-more* Micro-Graphic panel can be powered by an *AutomationDirect* PLC. If connecting *C-more* Micro-Graphic panels to more than one port on an *AutomationDirect* PLC, the additional panel must use an external power supply.

## *Direct*LOGIC:

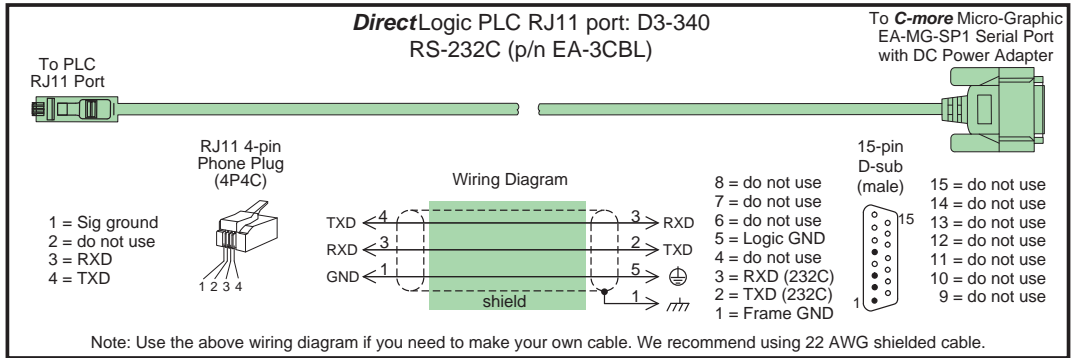
## EA-2CBL-1



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

**DirectLOGIC:**

**EA-3CBL**

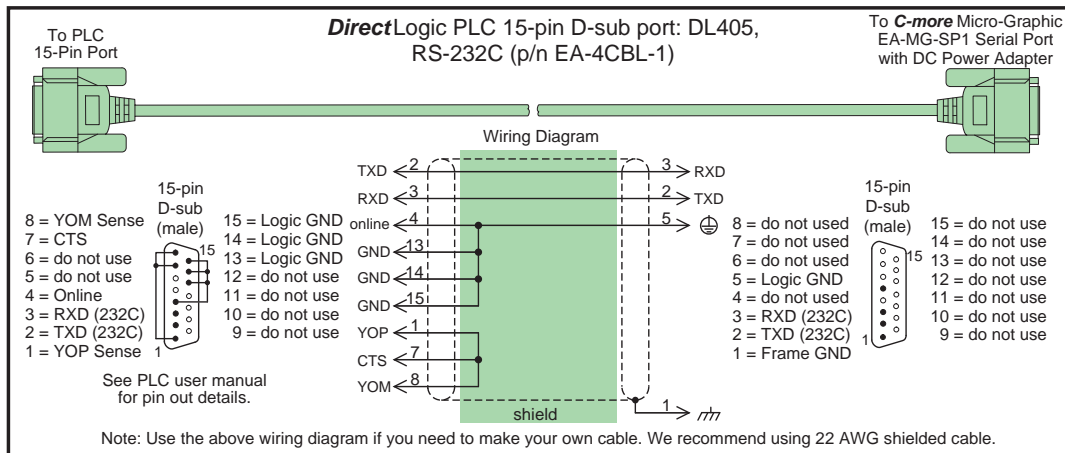


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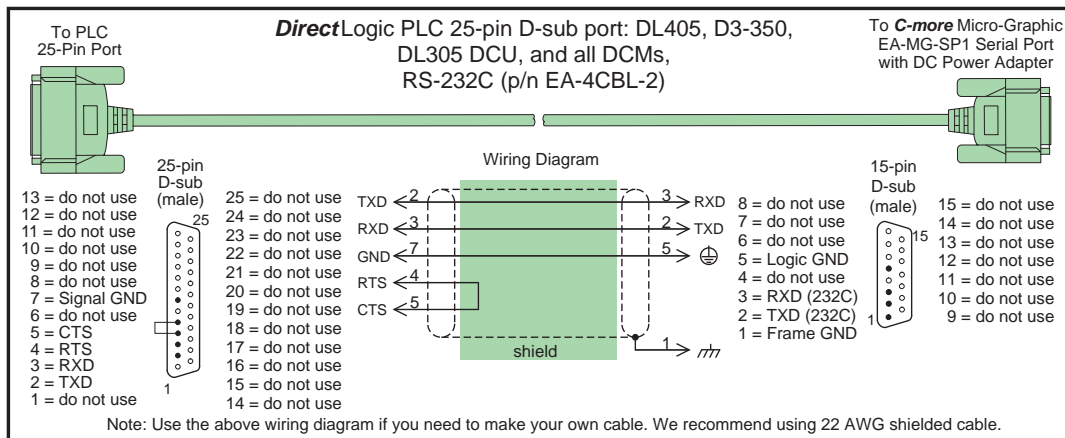
## Available Purchased Cables – Wiring Diagrams (cont'd)

### DirectLOGIC:

### EA-4CBL-1



### EA-4CBL-2

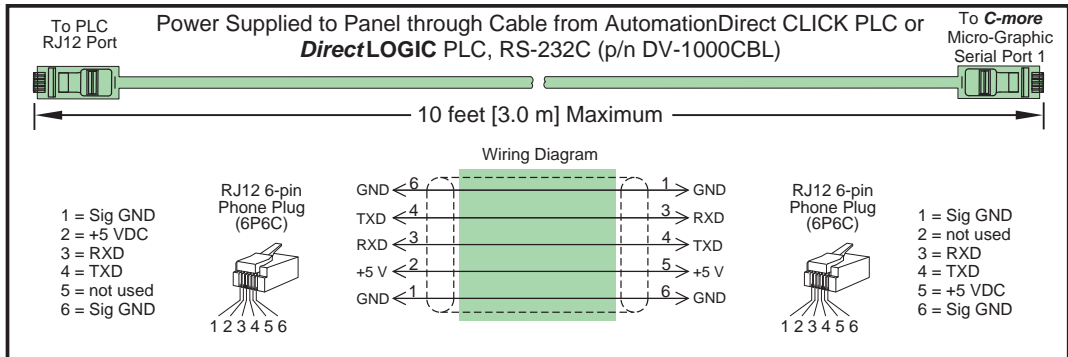




## Available Purchased Cables – Wiring Diagrams (cont'd)

### CLICK & *Direct*LOGIC:

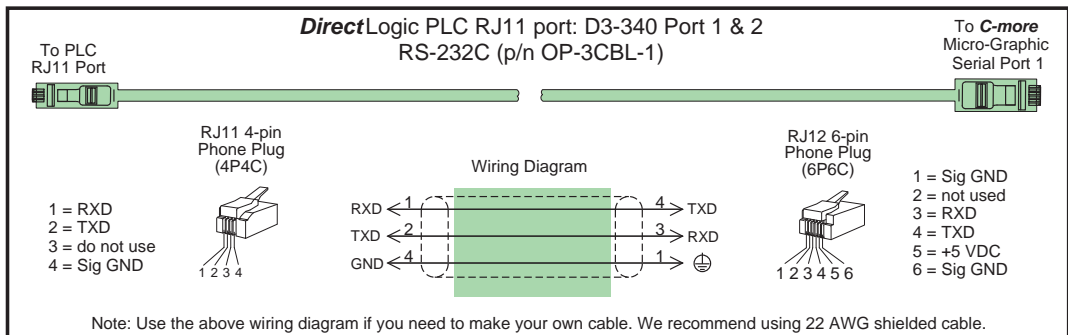
### DV-1000CBL



**Note:** Only one *C-more* Micro-Graphic panel can be powered by an AutomationDirect PLC. If connecting *C-more* Micro-Graphic panels to more than one port on an AutomationDirect PLC, the additional panel must use an external power supply.

### *Direct*LOGIC:

### OP-3CBL-1



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

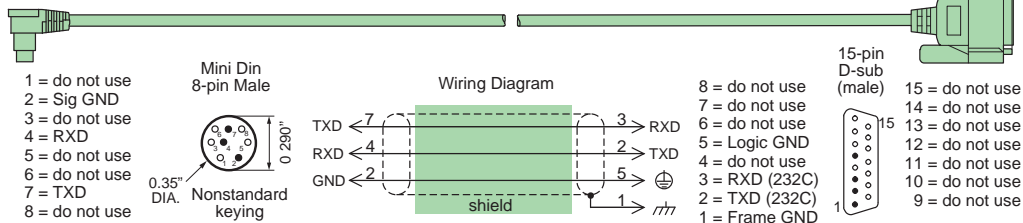
### Allen-Bradley:

### 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  
EA-MG-SP1 Serial Port  
with DC Power Adapter



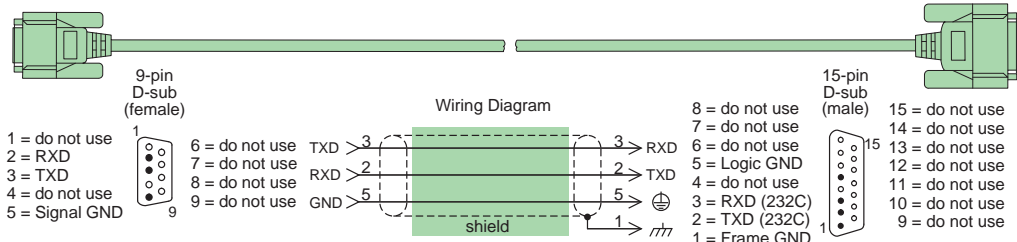
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

### 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



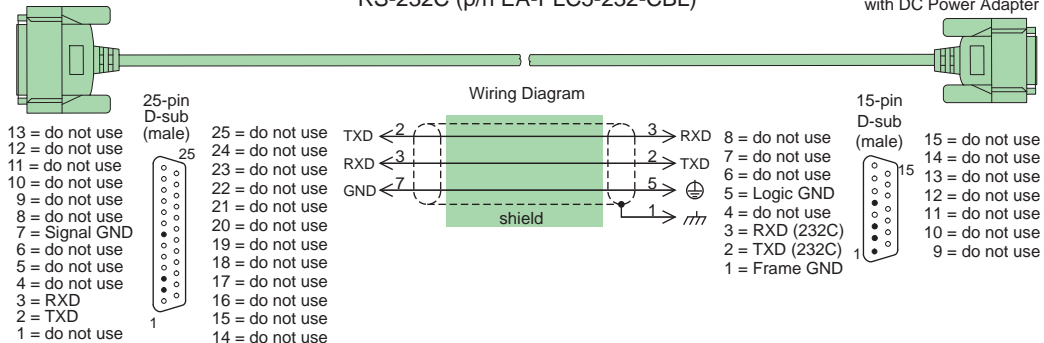
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

### 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

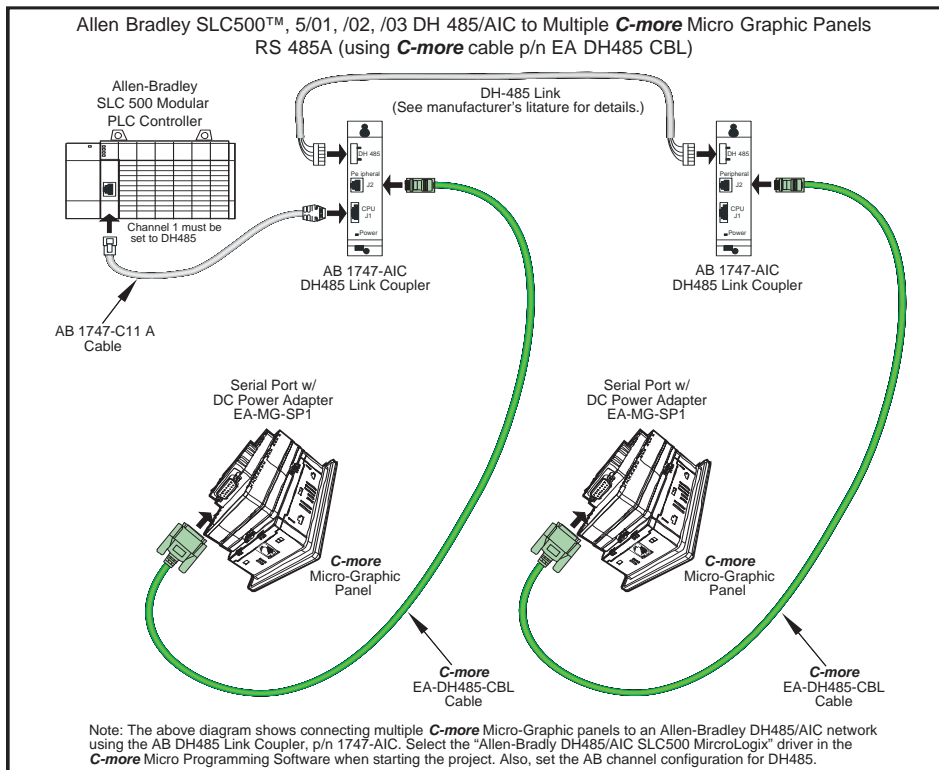
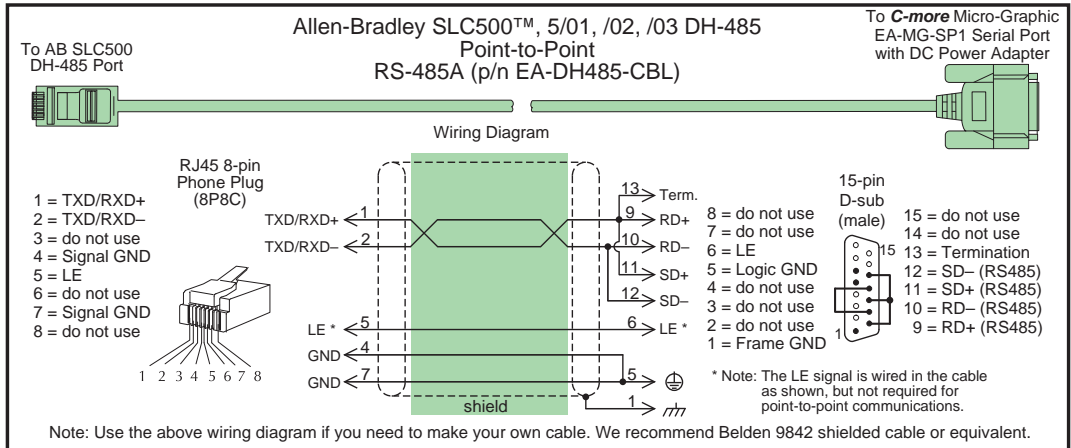


Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

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

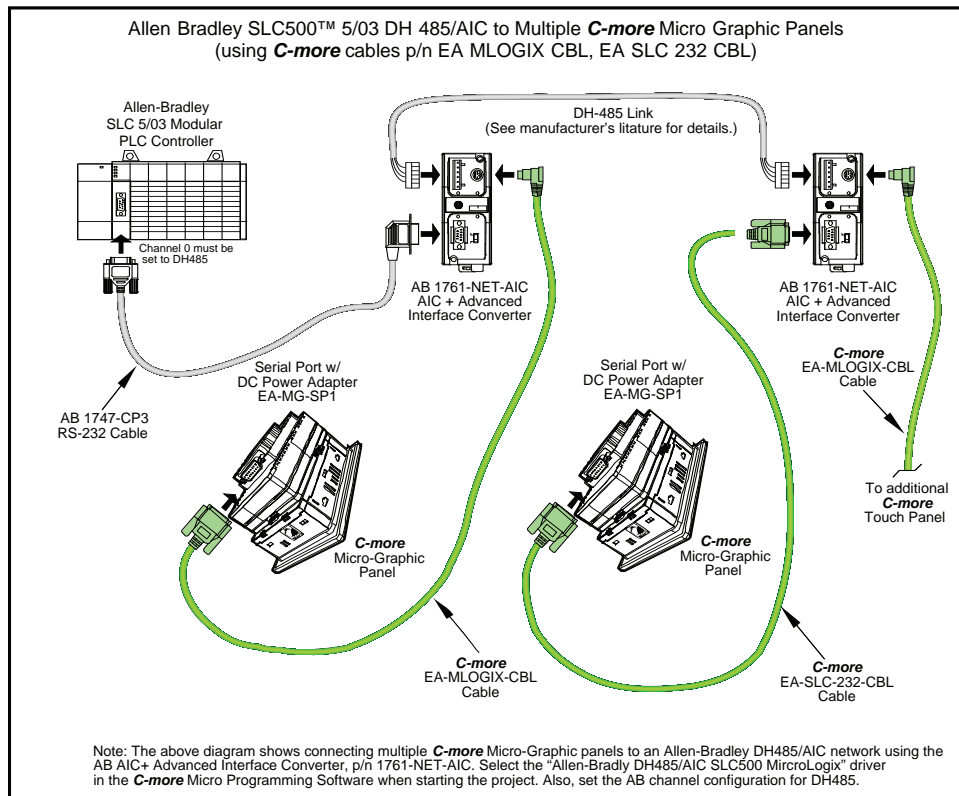
Allen-Bradley:

**EA-DH485-CBL**



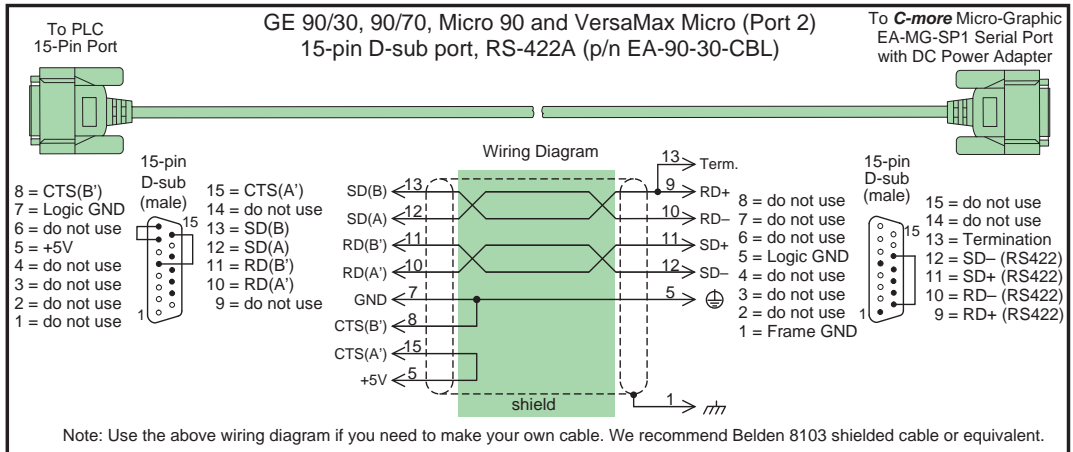
## Available Purchased Cables – Wiring Diagrams (cont'd)

### Allen-Bradley:



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

GE:

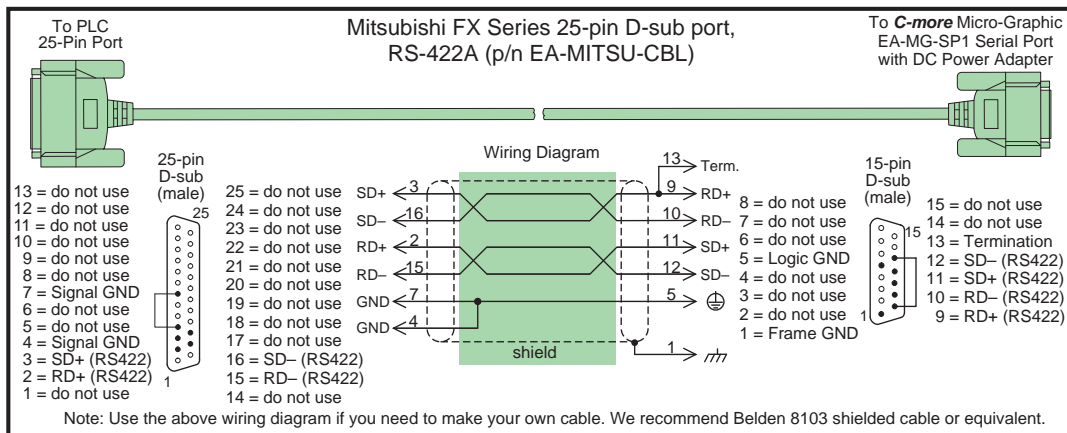
**EA-90-30-CBL**

6

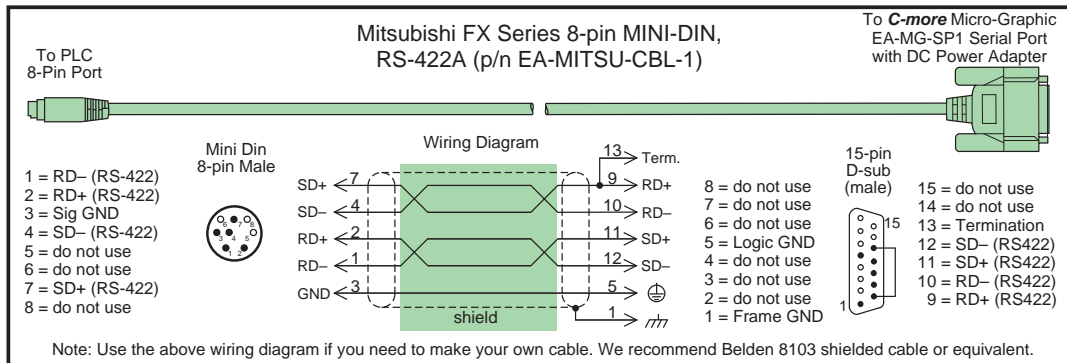
## Available Purchased Cables – Wiring Diagrams (cont'd)

### Mitsubishi:

### EA-MITSU-CBL

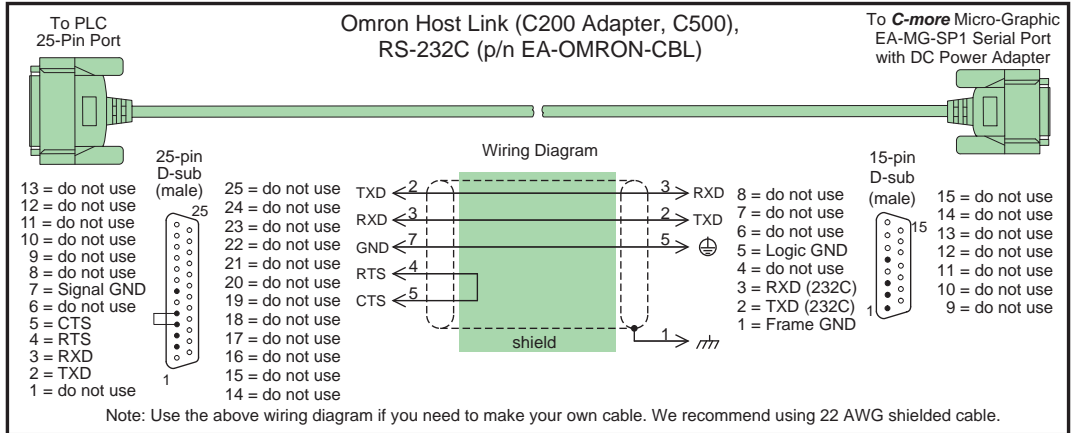


### EA-MITSU-CBL-1



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

Omron:

**EA-OMRON-CBL**

6

# User Constructed Cables – Wiring Diagrams

Diagram 1

User Constructed

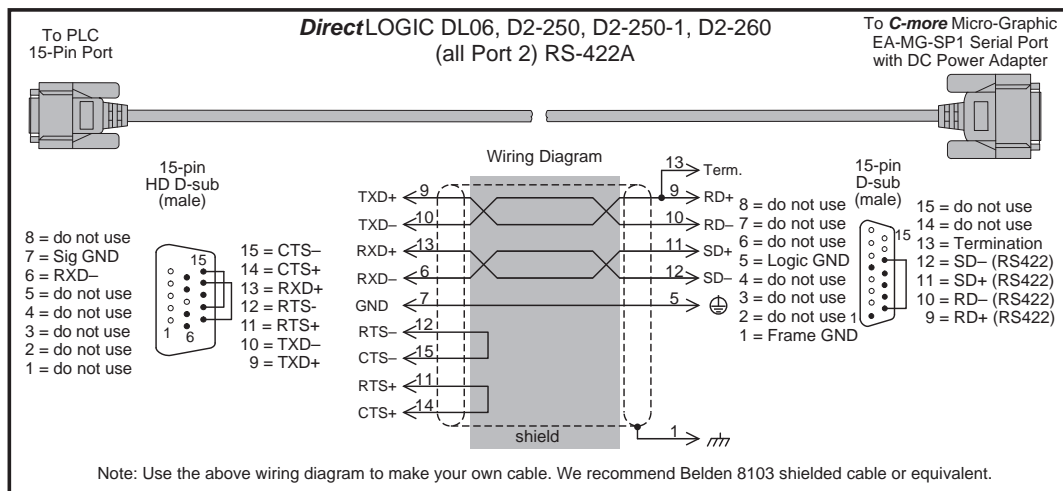
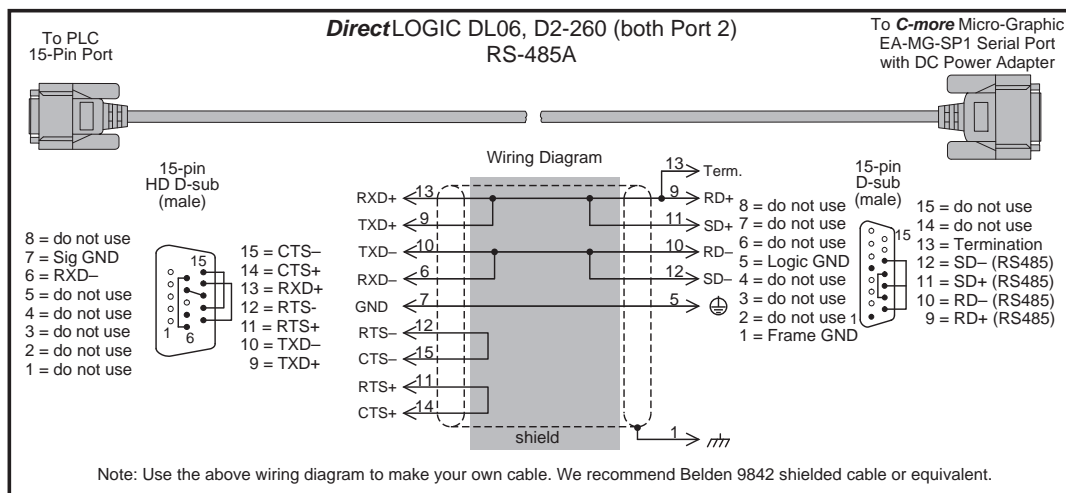


Diagram 2

User Constructed



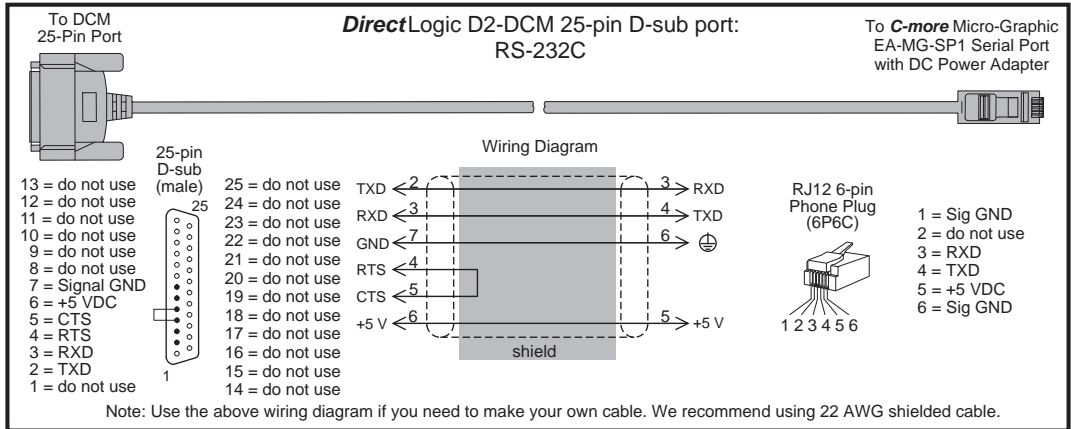
**NOTE:** The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-38 if more than one PLC will be connected to a panel.



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

Diagram 3

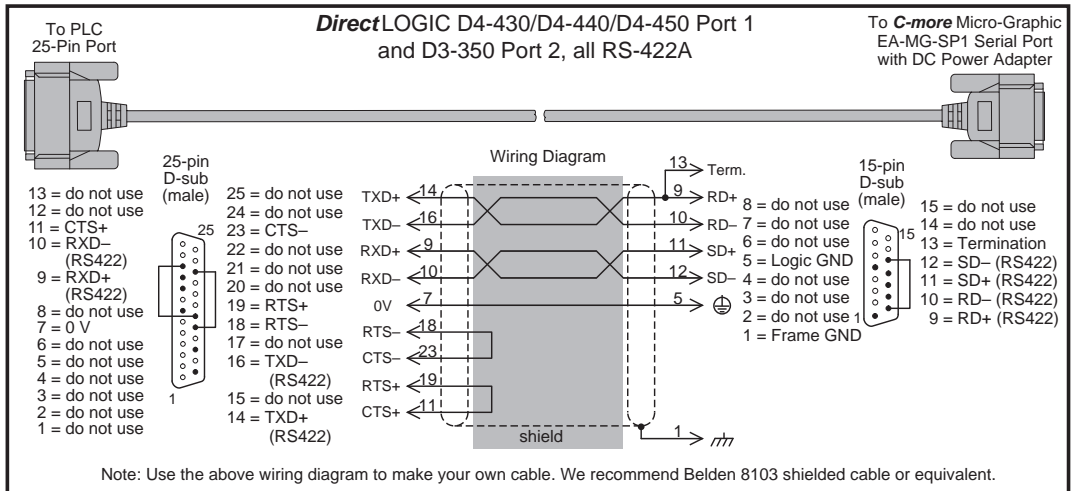
User Constructed



6

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

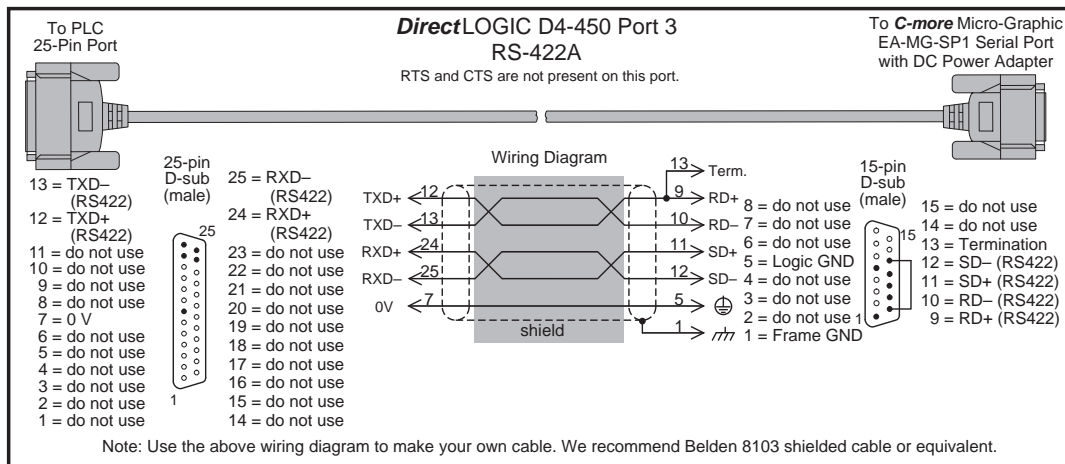
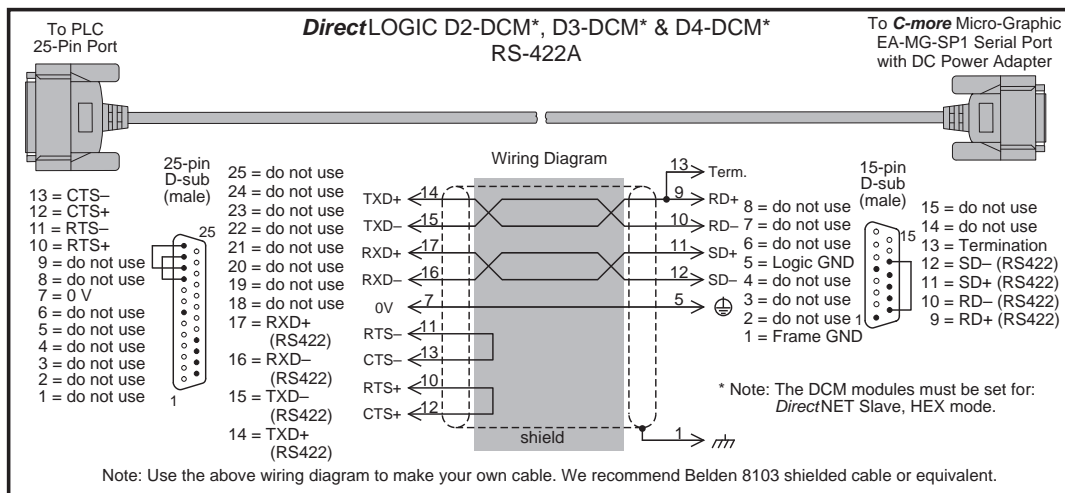


Diagram 6

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

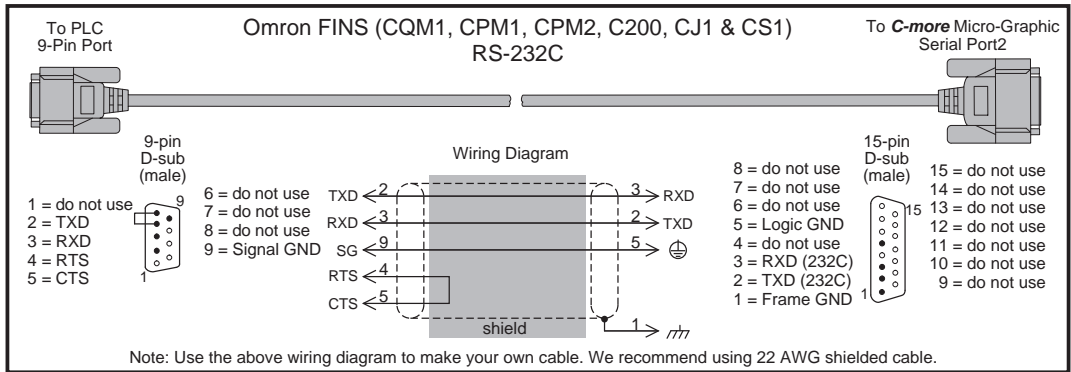
**User Constructed**

Diagram 8

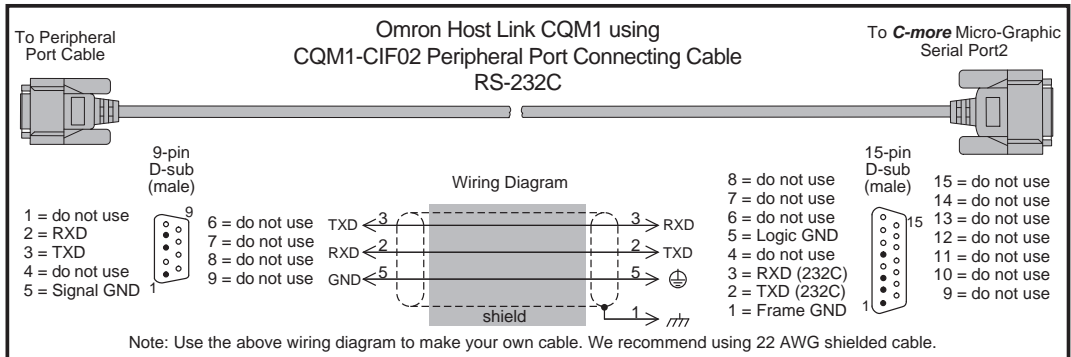
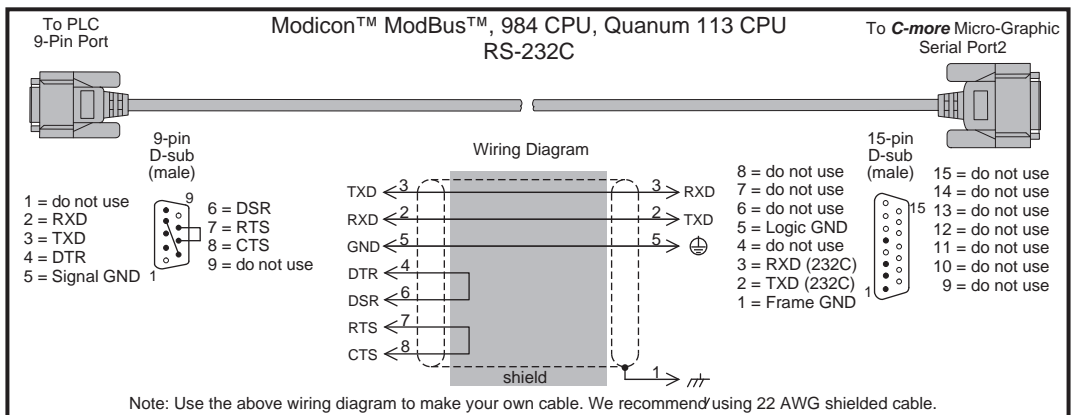
**User Constructed**

Diagram 9

**User Constructed**

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

Diagram 10

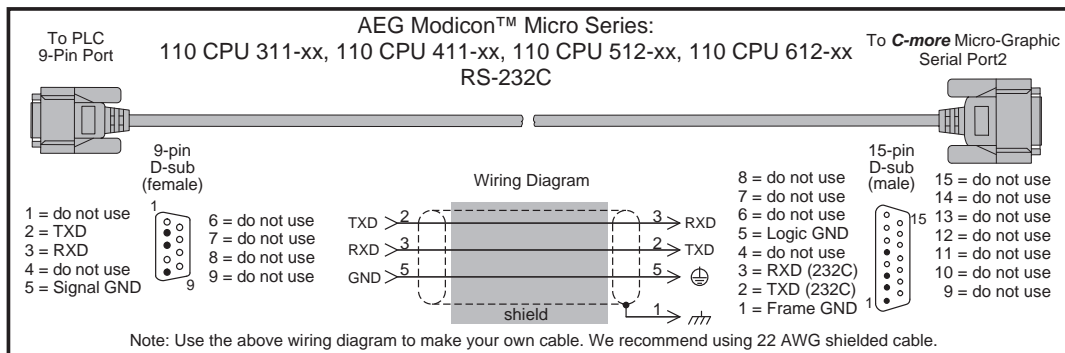
**User Constructed**

Diagram 11

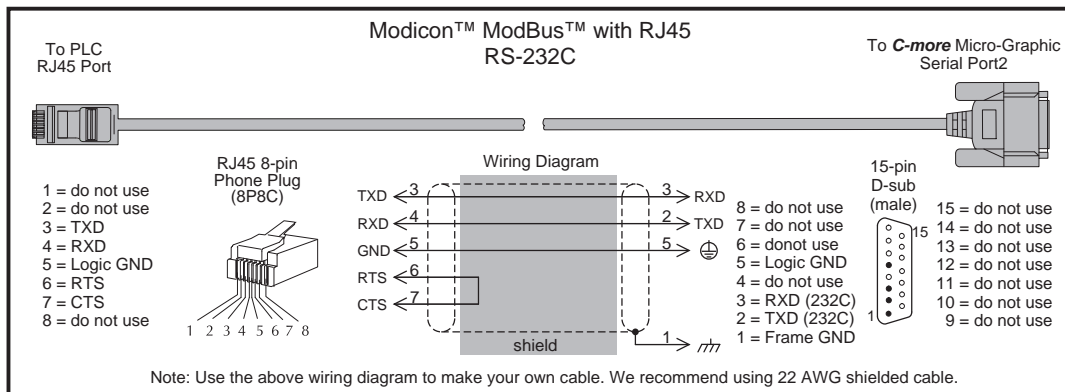
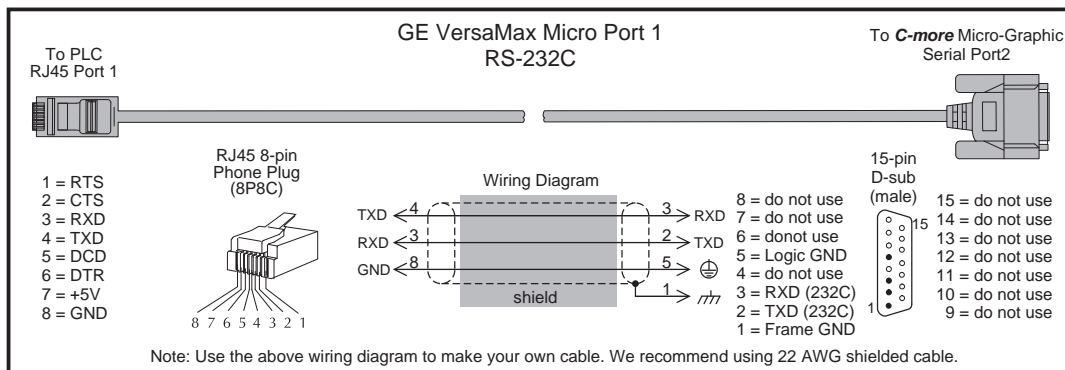
**User Constructed**

Diagram 12

**User Constructed**

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

Diagram 13

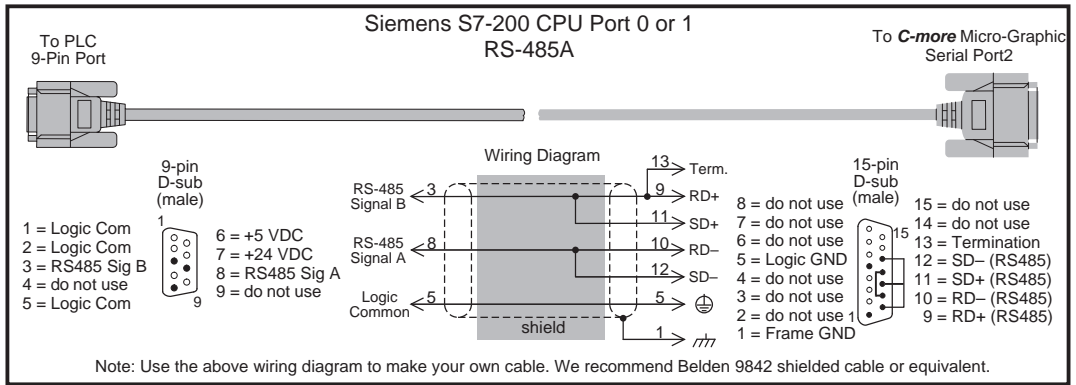
**User Constructed**

Diagram 14

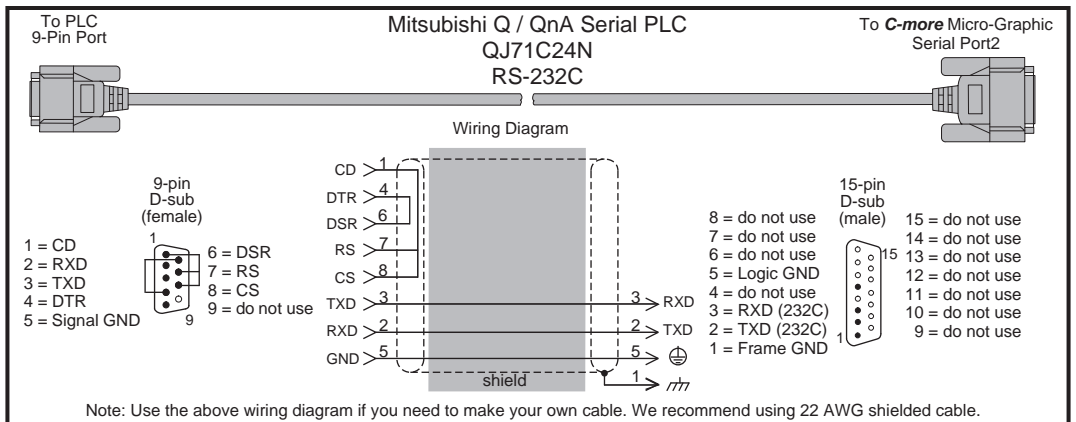
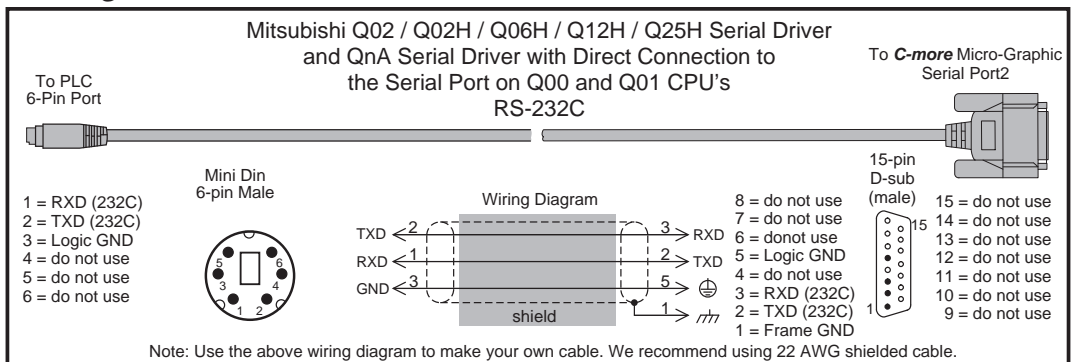
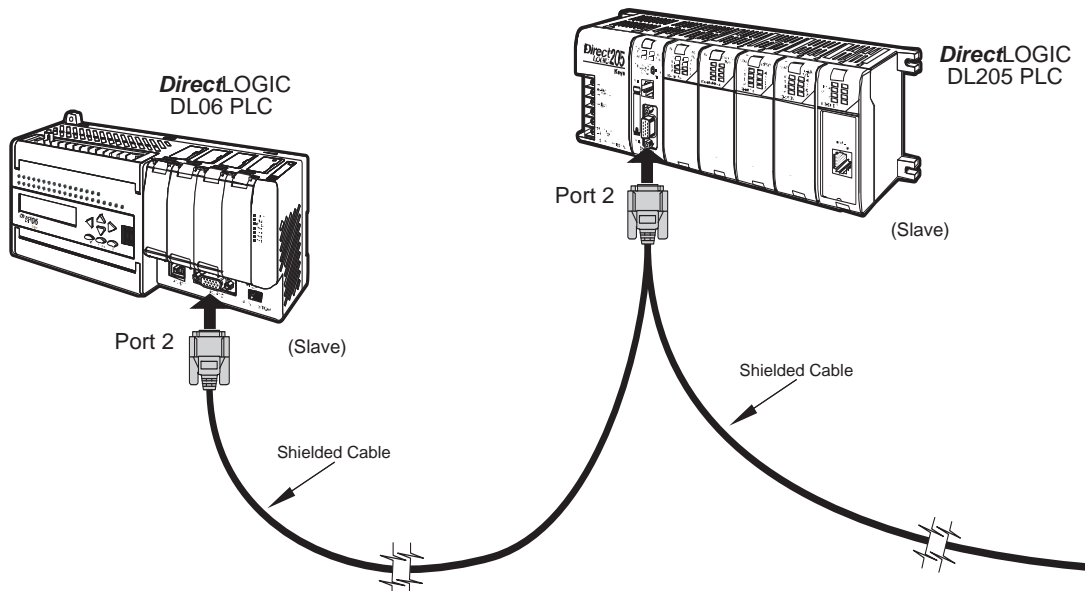
**User Constructed**

Diagram 15

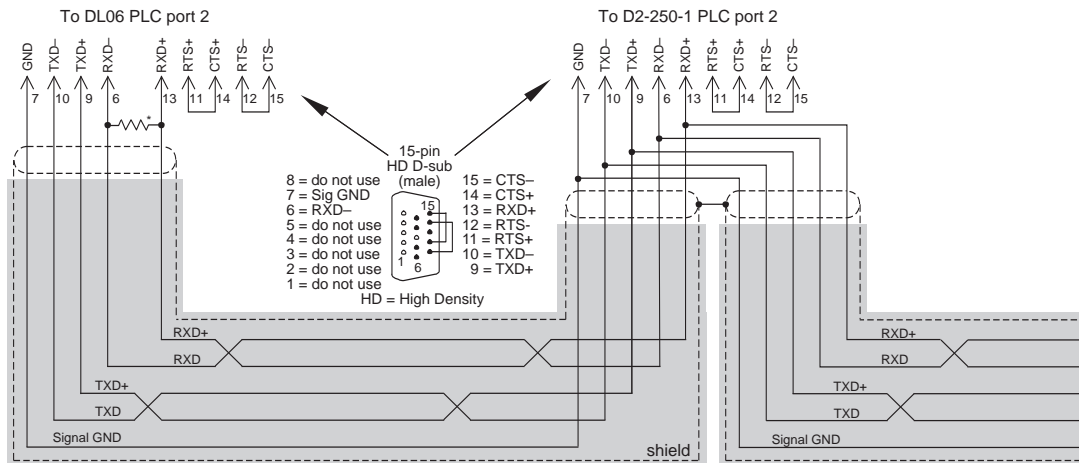
**User Constructed**

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

6



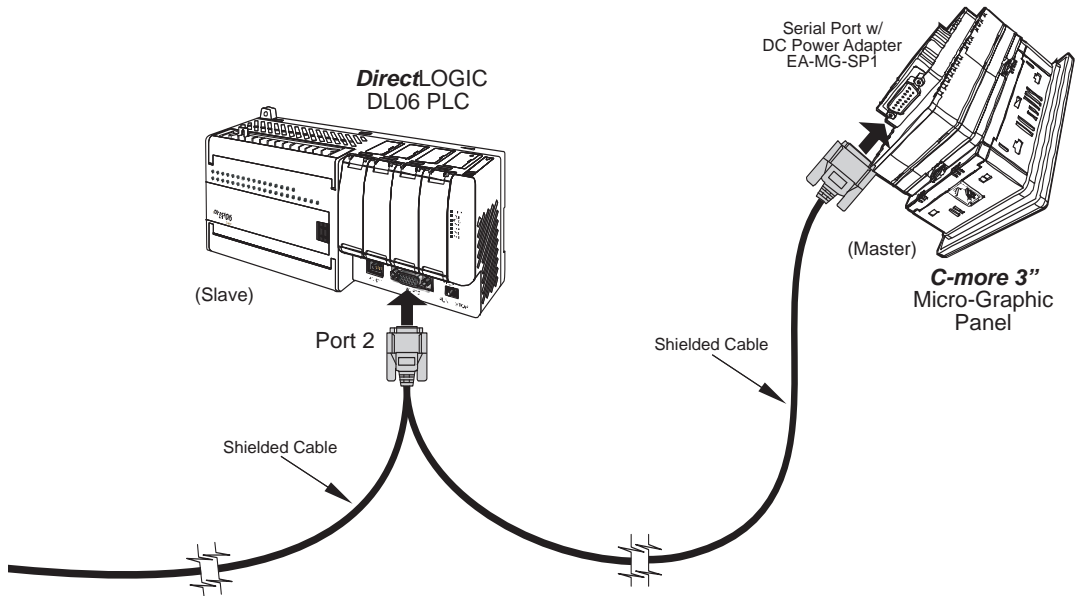
Note: We recommend Belden 8103 shielded cable or equivalent.



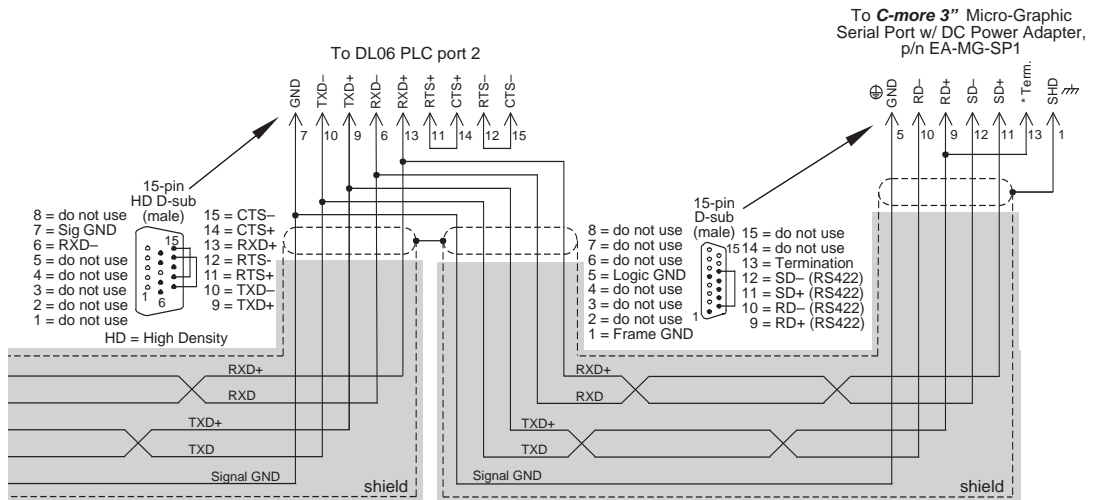
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

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.

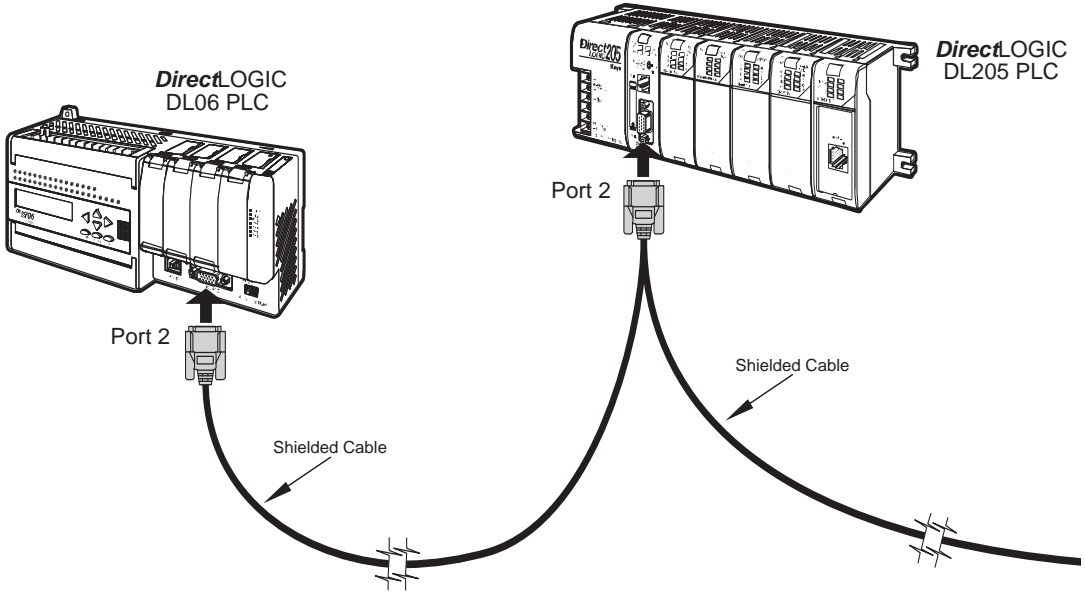


Typical RS-422 Multi-Drop Wiring Diagram (cont'd)

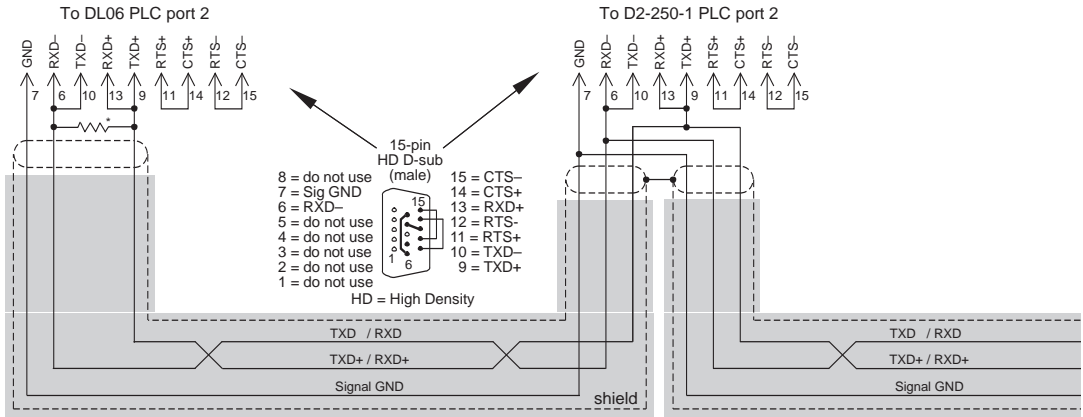
\* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more EA-MG-SP1 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then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

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

6



Note: We recommend Belden 88102 shielded cable or equivalent.

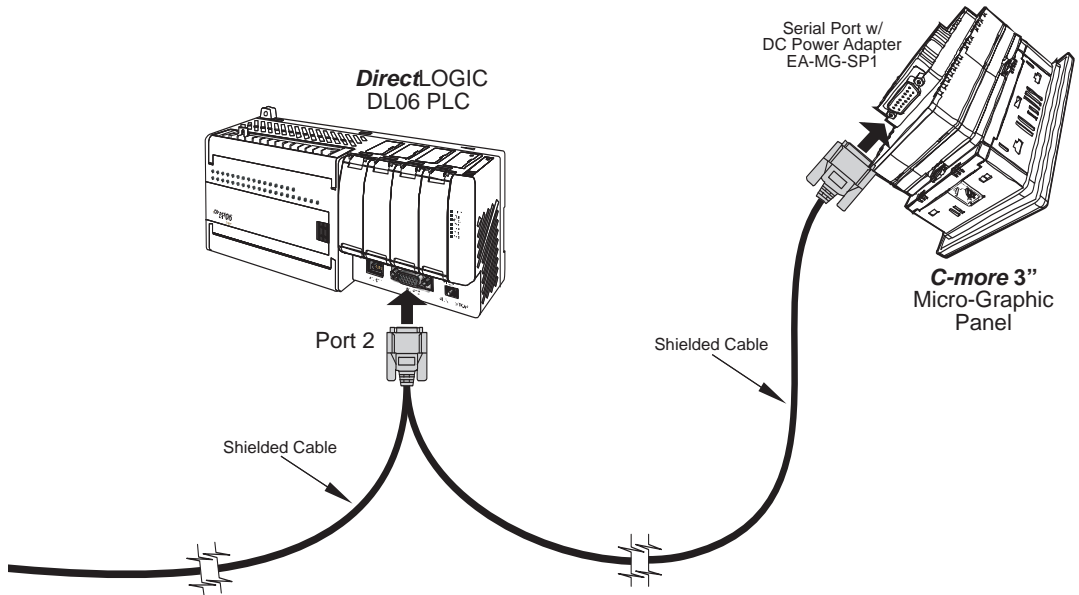


\* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

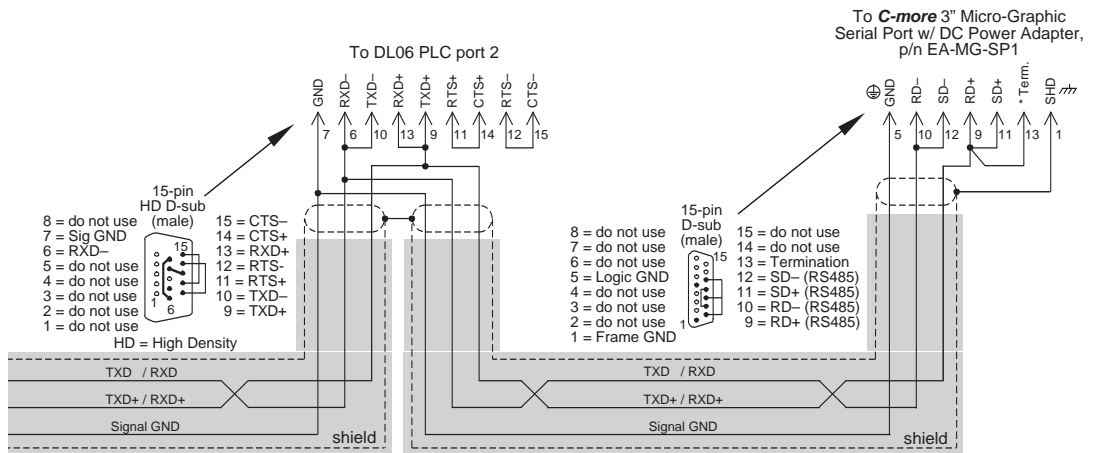
Typical RS-485 Multi-Drop Wiring Diagram



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



Note: We recommend Belden 88102 shielded cable or equivalent.



\* 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-485 Multi-Drop Wiring Diagram (cont'd)



# MAINTENANCE

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# CHAPTER 7

## In This Chapter...

|  |     |
|--|-----|
| Project Backup .....   | 7-2 |
| Check Operating Environment .....                                      | 7-2 |
| Check Operating Voltage .....  | 7-2 |
| Check Transmit and Receive Indicators .....                            | 7-3 |
| Check Physical Conditions .....  | 7-3 |
| Run Tests under the System Setup Screens .....                         | 7-4 |
| Check Settings under the System Setup Screens .....                    | 7-5 |
| Cleaning the Display Screen .....                                      | 7-5 |
| Check Project Functionality .....                                      | 7-6 |
| Checks from the <i>C-more</i> Micro-Graphic Programming Software ..... | 7-6 |

# 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.

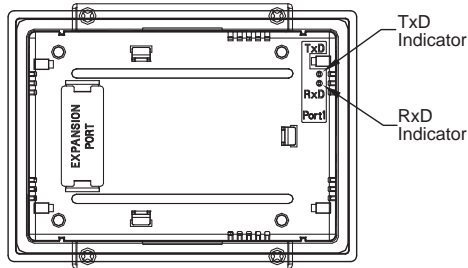


**5 VDC:** If the panel is being powered with 5 VDC from an *AutomationDirect* PLC's RJ12 serial communications port to Port 1 on the panel, the acceptable voltage range to the panel is 4.75-5.25 VDC (1.05 W @ 5 VDC (210 mA)).

**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).

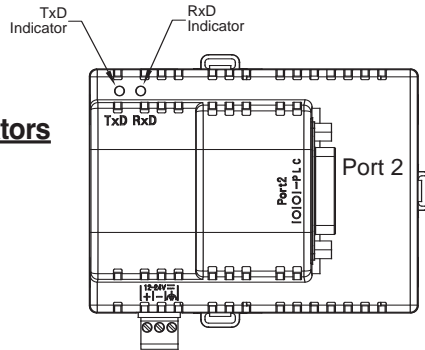
## Check Transmit and Receive Indicators

During a routine maintenance check is a good time to take a quick look at the status indicators on the back of the *C-more* 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.



**Micro-Graphic Panel  
Port 1 Status Indicators**

**EA-MG-SP1  
Port 2 Status Indicators**



## Check Physical Conditions

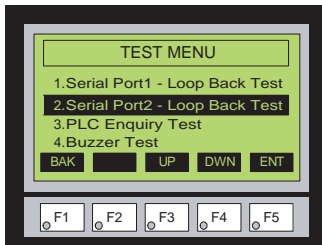
Make sure that harmful chemicals are not being used around the *C-more* Micro-Graphic panel. Look for any deterioration of the panel's bezel and front display area. See **Chapter 2: Specifications** for a chemical compatibility list.

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**.

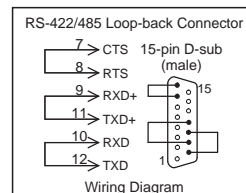
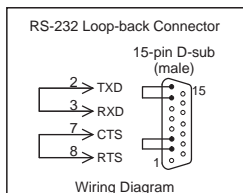
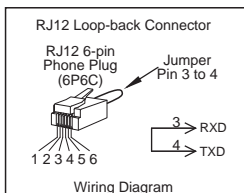
## Run Tests under the System Setup Screens

Use the *C-more* 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.

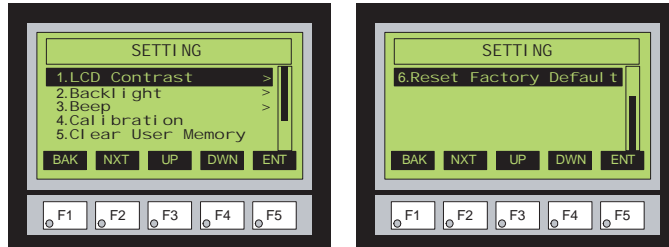
**Buzzer Test** - Use this option to test the internal audible beeper of the panel.



**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 *C-more* 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

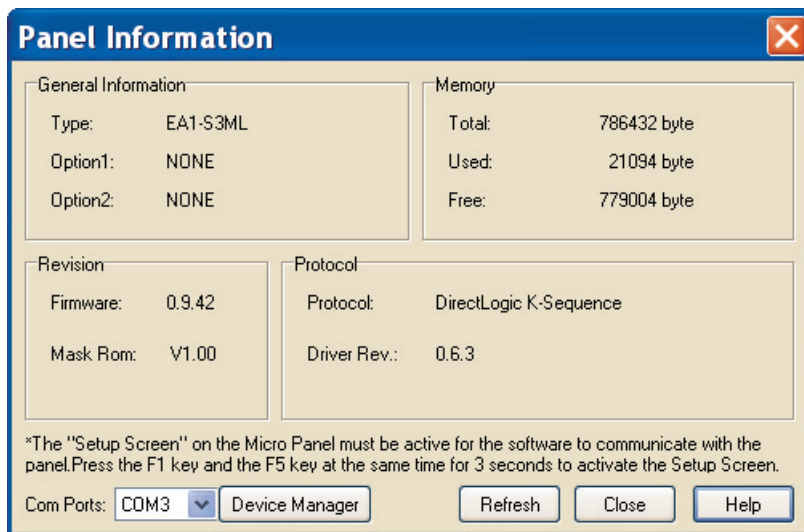
During a routine maintenance check is a good time to verify the functionality of your application, making sure that various areas on different screens do what they were designed to do. An outline or specification for the application is a useful tool for testing the various aspects of your application.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



# TROUBLESHOOTING

---



# 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.

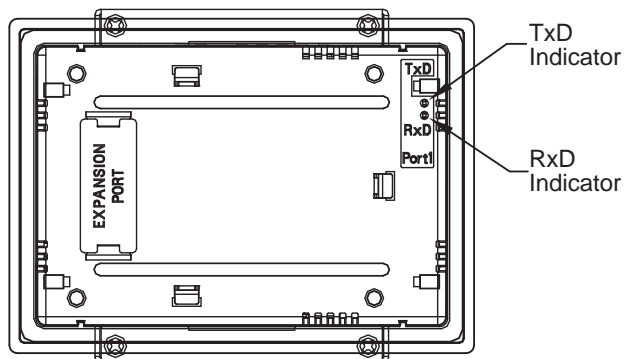
### *C-more* Micro-Graphic Panel does not Power up

**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.

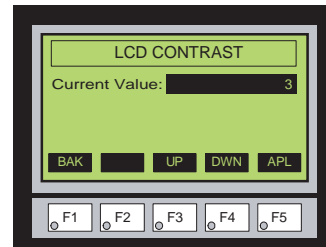
### Display is Blank

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

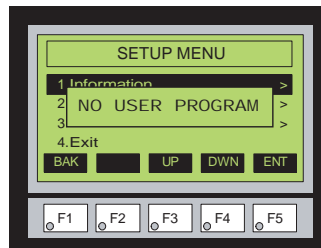
Press the F1 and F5 keys simultaneously for 3 seconds to access the System Setup Screen menu. Select the Setting menu, and then select item 1, LCD Contrast. The default value is 3. Adjust the current value from 1 to 5 and the panel's contrast should become greater as the value moves toward 5 and it should 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.

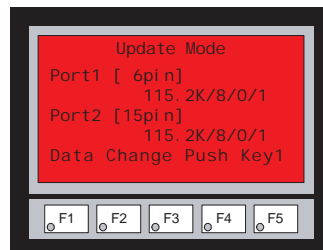
8



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

If the *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 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.

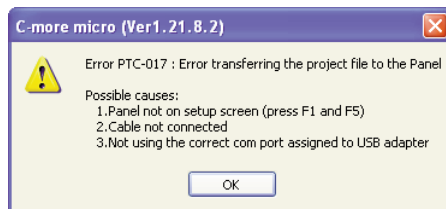


**NOTE:** If either DC power adapter is installed on the panel, the adapter must be powered and the panel not dependent on +5 VDC from the PLC's RJ12 comm port.

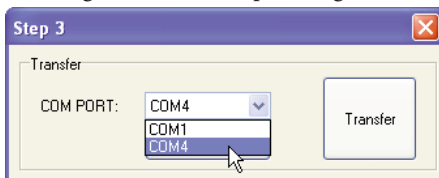
No communications between panel and PC continued top of next page.

### 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.

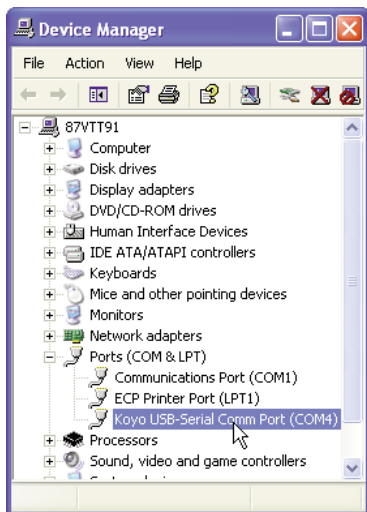
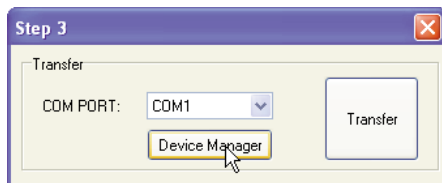


1. **Panel not on setup screen (press F1 and F5)** - Press and hold the F1 and F5 buttons simultaneously for three seconds to enter the setup screen.
2. **Cable not connected** - Double check the programming cable assembly to make sure the panel is correctly connected to the USB port on the PC.
3. **Not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

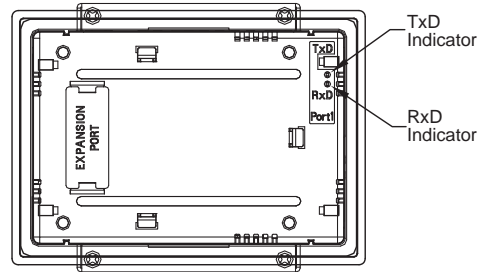
If the program persists, call Technical Support at (770) 844-4200, available from 9:00 A.M. to 6:00 P.M. Eastern Time.



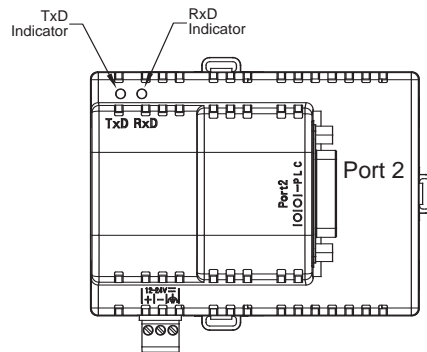
## No Communications between Panel and PLC

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:

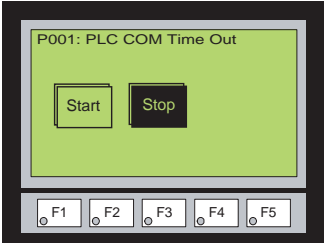
| C-more Micro-Graphic Panel Error Table |   |   |
|--|---|---|
| Error Code                             | Error Message                           | Cause   |
| P001                                   | PLC Com Time Out                        | A timeout occurred after sending a request to the PLC.                                      |
| 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<br>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



## 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.

### 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.

## 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.<br>Cycle power at the panel.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | See Chapter 8 for Electrical Noise Problems.<br>Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.       |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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.            |

### 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.

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

# REPLACEMENT PARTS

---



## CHAPTER 9

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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> 3" Micro-Graphic panels (pk of 2)   | EA-MG-S3ML-GSK | Replacement mounting gasket for <i>C-more</i> 3" Micro-Graphic panels  |
| EA-MG-BZ1-BRK  | Replacement mounting clip for <i>C-more</i> 3" Micro-Graphic keypad bezel EA-MG-BZ1 (pk of 2)   | EA-MG-BZ1-GSK  | Replacement mounting gasket for <i>C-more</i> 3" Micro-Graphic keypad bezel EA-MG-BZ1                        |
| EA-MG-BZ2-BRK  | Replacement mounting clip for <i>C-more</i> 3" Micro-Graphic keypad bezel EA-MG-BZ2 (pk of 8)   | EA-MG-BZ2-GSK  | Replacement mounting gasket for <i>C-more</i> 3" 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> 3" Micro-Graphic panels (pk of 5) | EA-MG-S3ML-FKL | Replacement function key label insert for <i>C-more</i> 3" Micro-Graphic panels (pk of 10; 5 blank, 5 F1-F5) |

Replacement Parts

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Panel Mounting Clips  
Part No. EA-MG-S3ML-BRK



8-Button Keypad Bezel Mounting Clips  
Part No. EA-MG-BZ1-BRK



Panel Gasket  
Part No. EA-MG-S3ML-GSK



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 8)

### DC Power Connector

Part No. EA-MG-DC-CON



(pk of 5)

### 20-Button Keypad Bezel

#### Gasket

Part No. EA-MG-BZ2-GSK



### Function Keys Label Inserts

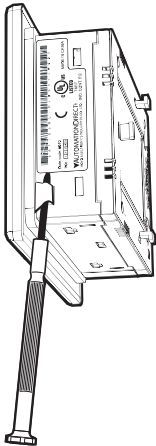
Part No. EA-MG-S3ML-FKL



(pk of 10; 5 blank, 5 F1-F5)

## Customizing the Function Keys Insert Label

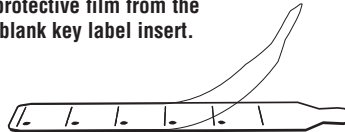
**Step 1 - Remove existing function key label insert using a small tool such as jeweler's screw driver.**



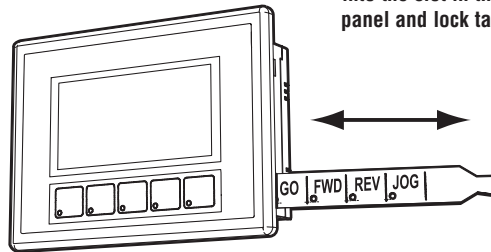
**Step 3 - If desired, print and apply self adhesive labels to the blank insert.**



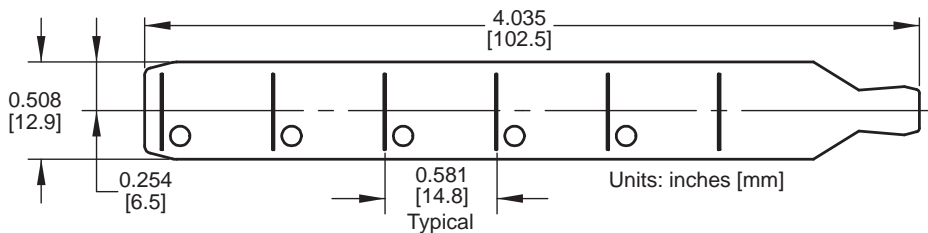
**Step 2 - Remove the protective film from the blank key label insert.**



**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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# Introduction

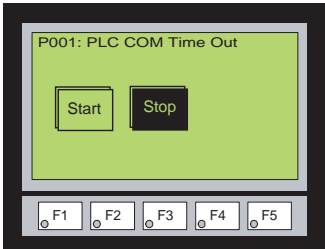
The *C-more*<sup>®</sup> Micro-Graphic panels are capable of communicating over RS232, RS422 and RS485 serial networks. They communicate with CLICK PLC's, all controllers in the *Direct LOGIC* family of PLCs utilizing various protocols and certain 3rd party PLCs. For a complete list of the supported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

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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.<br>Data was sent to the PLC via the Serial Port.<br>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.                     |

Modbus Protocols Error Code P499 Explanation

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

AutomationDirect CLICK

AutomationDirect DirectLOGIC - Modbus (Koyo)

Modicon Modbus RTU

Entivity Modbus RTU



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

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

## 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.

## DirectLOGIC – K-Sequence PLC Error Code Table

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



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 users manual for additional information.

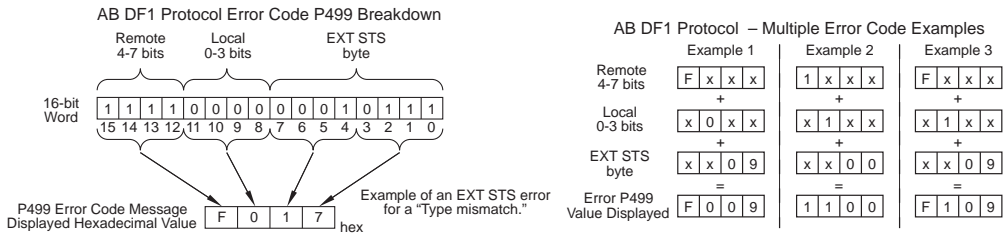
| PLC Error Codes for <i>Direct</i> LOGIC – K-Sequence |                      |
|--|----------------------|
| Panel Error Code<br>P499 Hex Value                   | Description          |
| 01F8   | Error setting value. |
| 020D   | Error in key mode.   |
| 021C   | Password protected.  |

## DirectLOGIC – DirectNET PLC Error Codes

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

# 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.



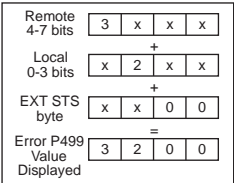
## Allen-Bradley PLC Error Code Displayed Example

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 users manual for additional information.

**PLC Errors for Allen-Bradley DF1 Protocol, Remote STS Errors (4-7 bits)**

| Panel Error Code<br>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<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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)

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| PLC Errors for Allen-Bradley DF1 Protocol, EXT STS Command Code for F0 Command |   |
|--|---|
| Panel Error Code<br>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;<br>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 users manual for additional information.

### PLC Errors for Allen-Bradley DH485 Protocol, Local STS Errors (0-3 bits)

| Panel Error Code<br>P499 Hex Value | Description   |
|------------------------------------|---|
| 0x0                                | Success; no error.  |
| 0x1                                | DST node is out of buffer space.  |
| 0x2                                | Cannot guarantee delivery; link layer.<br>(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<br>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<br>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.

### 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 users manual for additional information.

| PLC Errors for GE SNPX Protocol (Major) |  |
|---|--|
| Panel Error Code<br>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.<br>(Series 90-70 PLC CPUs only)   |
| 0x0051                                  | Problem with getting mail from the slave Service Request task.<br>(Series 90-70 PLC CPUs only)   |
| 0x0055                                  | Slave SNP task timed out before receiving an SRP response.<br>(Series 90-70 PLC CPUs only)   |
| 0x0056                                  | Slave SNP task could not find the requested datagram connection.<br>(Series 90-70 PLC CPUs only)   |
| 0x0057                                  | Slave SNP task encountered an error in trying to write the datagram.<br>(Series 90-70 PLC CPUs only)   |
| 0x0058                                  | Slave SNP task encountered an error in trying to update the datagram.<br>(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<br>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.<br>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.<br>(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.<br>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;<br>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.<br>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.<br>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.<br>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.<br>Modem is unable to complete the requested connection.<br>Check the local and remote modems and the telephone line.   |
| PLC Error 0x070F                                       | Queue Full indication from Service Request Processor in slave PLC CPU.<br>The slave is temporarily unable to complete the service request.<br>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)

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| PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd) |  |
|--|--|
| Panel Error Code<br>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;<br>the SNP-X slave device cannot return the data in an X-Response message.<br>(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.<br>(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.<br>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.<br>Must be 1 for I/O Fault Table, or 2 for PLC Fault Table.  |
| 0x100F   | Unexpected Service Request Processor error.<br>(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.<br>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.<br>Must be 0 for Series 90-70, or 1 for Series 90-30 or Series 90-20.  |
| 0x170C   | Invalid datagram type.<br>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<br>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).<br>Must use a smaller data length. Use multiple COMMREQs if necessary.  |
| 0x1D0C   | Invalid SNP-X communication session type.<br>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.<br>The Broadcast SNP ID is not permitted in a single-slave SNP-X session.<br>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.<br>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.<br>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.<br>A maximum of two retries are permitted.<br>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.<br>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<br>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.<br>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.<br>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).<br>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<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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<br>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<br>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)

| PLC Errors for GE SNPX Protocol (Minor-Major) (cont'd) |  |
|--|--|
| Panel Error Code<br>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 *C-more* 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.

## Mitsubishi Q / QnA Series – PLC Error Codes

The following table lists the errors that can be generated by the Mitsubishi Q / QnA Series PLC when using the Q / QnA 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 users manual for additional information.

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |   |
|---|---|
| Panel Error Code<br>P499 Hex Value                  | Description   |
| 0x4000  | Serial communications checksum error. Check cable and grounding.  |
| 0x4001  | Unsupported request sent to PLC.  |
| 0x4002  | Unsupported request sent to PLC.  |
| 0x4003  | Global request sent to PLC that cannot be executed.   |
| 0x4004  | System protect switch is on and request was sent that cannot be executed. Also PLC, may still be booting up.                                  |
| 0x4005  | Packet sent is too large according to size request in header.   |
| 0x4006  | Serial communications could not be initialized.   |
| 0x4008  | CPU busy or buffer full.  |
| 0x4010  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4013  | Request cannot be serviced while CPU is running. CPU must be stopped.   |
| 0x4021  | Drive memory does not exist.  |
| 0x4022  | File (ZR memory) does not exist.  |
| 0x4023  | File (ZR memory) name and File (ZR memory) number do not match.   |
| 0x4024  | File (ZR memory) inaccessible by user.  |
| 0x4025  | File (ZR memory) is locked by another device.   |
| 0x4026  | File (ZR memory) password required.   |
| 0x4027  | Specified range is out of File (ZR memory) range.   |
| 0x4028  | File (ZR memory) already exist.   |
| 0x4029  | Specified File (ZR memory) capacity cannot be retrieved.  |
| 0x402A  | Specified File (ZR memory) is abnormal.   |
| 0x402B  | The requested data cannot be executed in the specified drive memory.  |
| 0x402C  | The requested operation cannot be executed presently.   |
| 0x4030  | The specified data type does not exist. Check the CPUs allowable data types.  |
| 0x4031  | The specified address is out of range. The data type requested may need to be expanded in GX developer. The CPU may not allow this data type. |
| 0x4032  | Address qualification is incorrect.   |
| 0x4033  | Cannot write to system area.  |
| 0x4034  | Request cannot be executed because completion address for an instruction cannot be turned on.   |

(PLC generated error codes for the Mitsubishi Q / QnA protocol continued on the next page.)

## Mitsubishi Q / QnA Series – PLC Error Codes (cont'd)

| PLC Error Codes for Mitsubishi Q / QnA and Q Series |  |
|---|--|
| Panel Error Code<br>P499 Hex Value                  | Description  |
| 0x4040  | Module doesn't support request.  |
| 0x4041  | Request is out of module's range.  |
| 0x4042  | Module cannot be accessed.   |
| 0x4043  | Address for specified module is incorrect.                                     |
| 0x4044  | Hardware problem exist for specified module.                                   |
| 0x4050  | Request cannot be executed because memory card protect switch is on.           |
| 0x4051  | Specified memory cannot be accessed.   |
| 0x4052  | Specified memory attribute is read only and cannot be written to.              |
| 0x4053  | Error occurred when writing to specified memory location.                      |
| 0x4080  | Request data error. Check cabling and electrical noise.                        |
| 0x4082  | Specified request is already being executed.                                   |
| 0x408B  | The remote request cannot be performed.  |
| 0x40A0  | A block number out of range was specified.                                     |
| 0x40A1  | The number of blocks requested exceeds the range of the PLC.                   |
| 0x40A2  | A step number was specified out of range.                                      |
| 0x40A3  | Step range limit exceeded.   |
| 0x40A4  | Specified sequence step number is out of range.                                |
| 0x40A5  | Specified SFC device is out of range.  |
| 0x40A6  | Block specification and step specification are incorrect.                      |
| 0x4100  | CPU module hardware fault.   |
| 0x4101  | Serial communication connection incorrect.                                     |
| 0x4105  | CPU module internal memory fault. Bad CPU.                                     |
| 0x4106  | CPU is in initialization. Wait until CPU is booted up.                         |
| 0x4107  | Specified function not supported by this CPU. Check memory types for that CPU. |
| 0x4110  | Specified function not supported because CPU is in Stop. Put CPU in Run.       |
| 0x4111  | System is not up yet. Wait until system is up before performing request.       |
| 0x4A01  | The network number specified does not exist. Routing not supported in C-more.  |
| 0x4A02  | Station number specified does not exist. Routing not supported in C-more.      |

## 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<br>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<br>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<br>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.                                     |

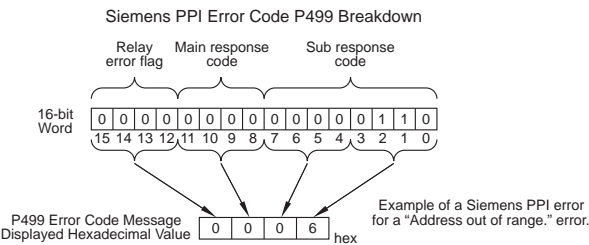
(PLC generated error codes for the Omron FINS protocol continued on the next page.)

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

| PLC Error Codes for Omron FINS     |  |
|------------------------------------|--|
| Panel Error Code<br>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<br>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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## **In This Appendix...**

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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.<br>Cycle power at the panel.  |
| R002                       | CRC Error occurred during project transfer from PC.                  | See Chapter 8 for Electrical Noise Problems.<br>Check the area for sources of noise: electrical motors, transformers, etc.<br>Check for proper grounding<br>Resend the project.       |
| R003                       | Project Check Sum Error. Resend Project file to Panel.               | Cycle power.<br>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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