GETTING STARTED

CHAPTER
1

In This Chapter...

1

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.

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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

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 class 2 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, CSA & CE agency approvals (see below for details)
- 2-year warranty from date of purchase

Agency Approvals
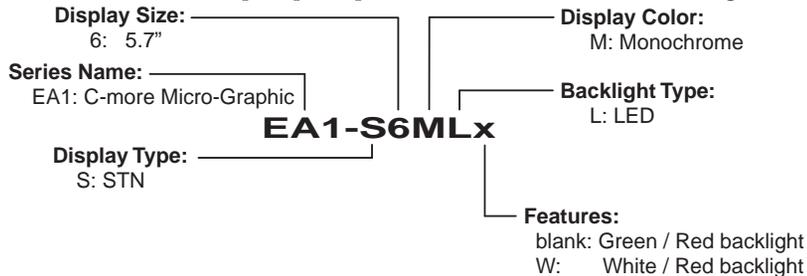
UL/CUL/CSA/CE Certification Numbers					
Name	UL/CUL	UL508	CSA	CE	ISO-9000
C-more Micro-Graphic Panels & Accessories	E157382	E157382	234884	EN61131-2	Yes

Part Number Key

Panel Part Number Key

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

Display Size:
6: 5.7"

Series Name:
EA1: C-more Micro-Graphic

Display Type:
S: STN

EA1-S6MLx

Display Color:
M: Monochrome

Backlight Type:
L: LED

Features:
blank: Green / Red backlight
W: White / Red backlight

Bezel Part Number Key

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

Series Name:
EA-MG6: C-more 6" Micro-Graphic
Bezel Option Module

EA-MG6-XXXX

Module Type:
BZ2:   20-Key Bezel for landscape mode
BZ2P: 21-Key Bezel for portrait mode
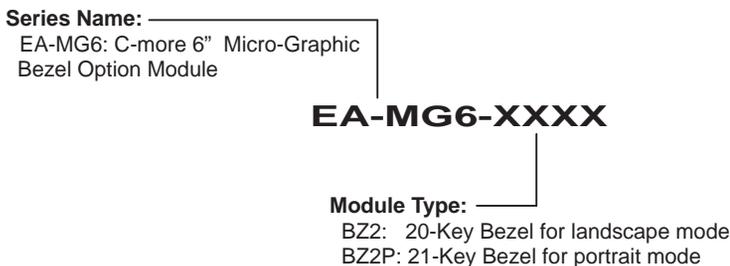
Product Label Example:

EA1-S6ML

EA1-S6MLW

Serial Number and Date Code format:

Serial Number = [Part Number]+[YYMDDFNNN]

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)

Date Code = YMMF

Y: Year (0–9 --- e.g. 07 = 2007)
MM: Month (01–12 --- e.g. X = Oct.)
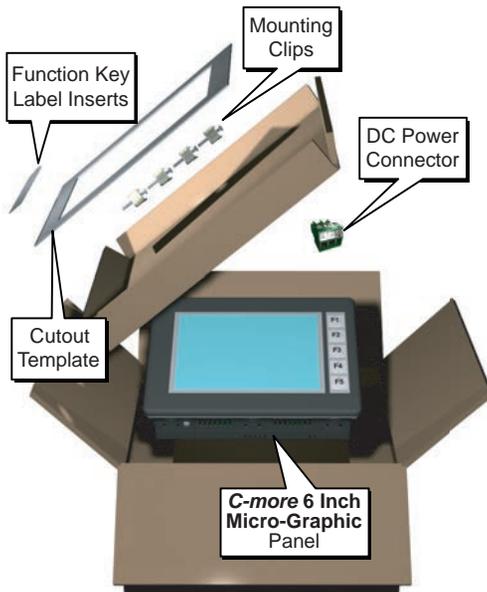**F:**   Manufacturing Site (0–9, A–Z)

Quick Start Steps

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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

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.

Shipping Carton Contents

Optional Accessories

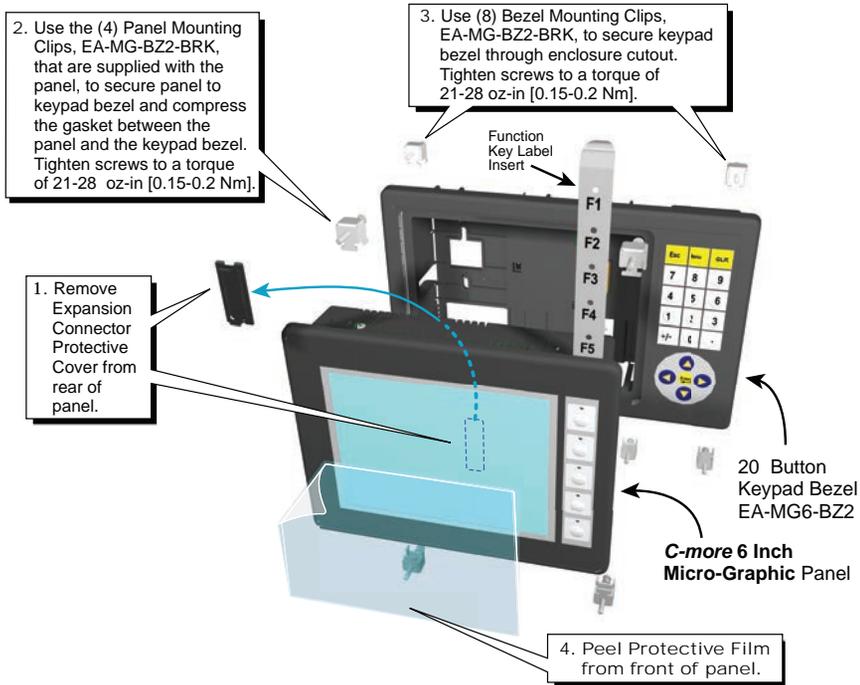*20-Button Horizontal Keypad Bezel*
EA-MG6-BZ2

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.

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].

Function Key Label Insert

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

20 Button Keypad Bezel EA-MG6-BZ2

C-more **6 Inch 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.

Optional Accessory
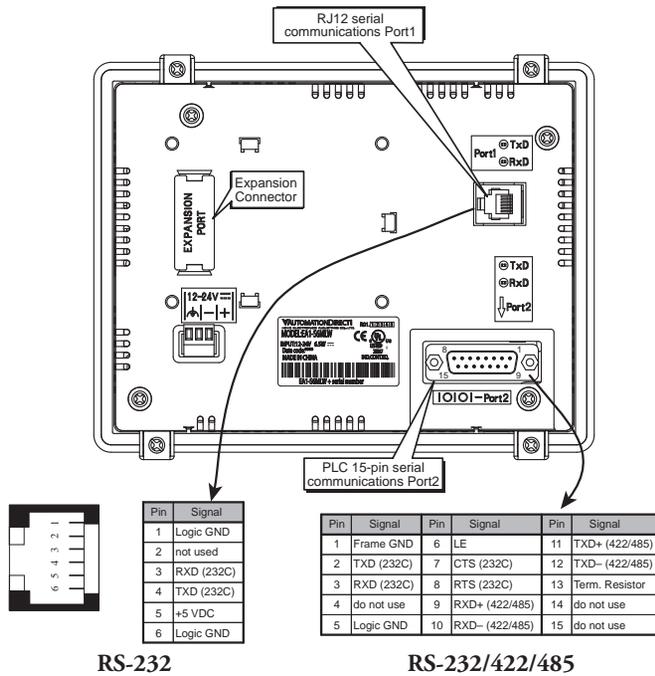
Clear Screen Overlay EA-6-COV2

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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.

RS-232

Pin	Signal
1	Logic GND
2	not used
3	RXD (232C)
4	TXD (232C)
5	+5 VDC
6	Logic GND

RS-232/422/485

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

> **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.

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

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

The screw torque range for the screws used on the panel mounting clips and the keypad bezel mounting clips is 21-28 oz-in [0.15-0.2 Nm].
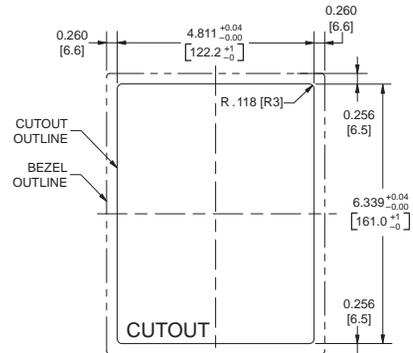
See **Chapter 2: Specifications** for additional product dimensions.
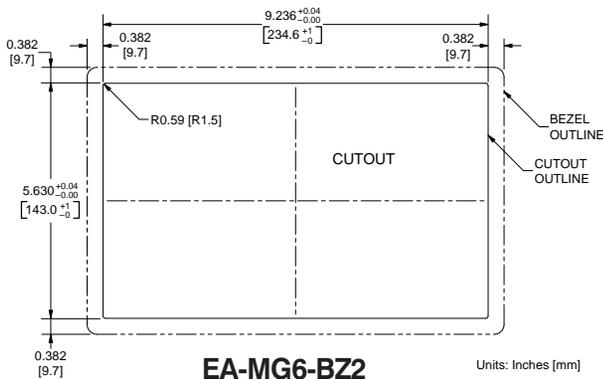**Chapter 3: Accessories** for accessory specifications and dimensions.

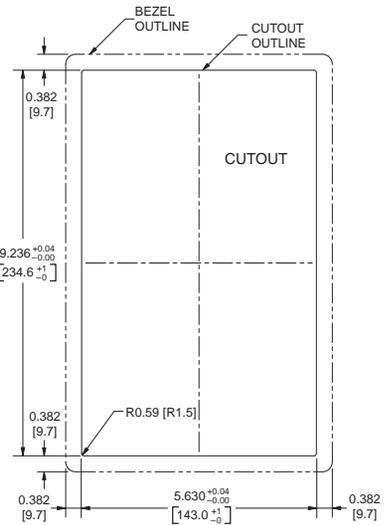**EA1-S6ML & EA1-S6MLW**
Panel Cutout
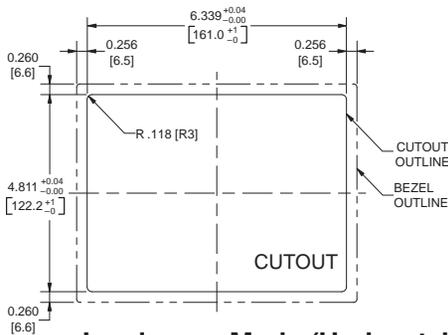
Landscape Mode (Horizontal)

Portrait Mode (Vertical)

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

Units: Inches [mm]

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

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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**

1.2
[30.0]

1.2
[30.0]

1.2
[30.0]

1.2
[30.0]
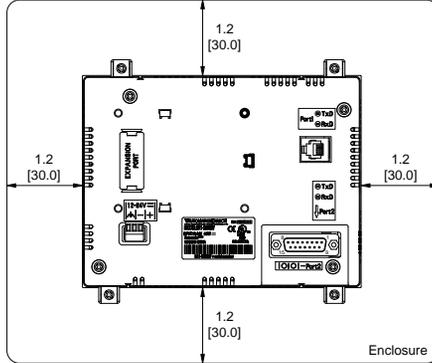
Enclosure

units: inches [mm]

**Panel with Keypad
Bezel**

Enclosure

1.2
[30.0]
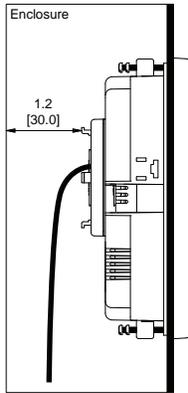
**EA1-S6ML(W) with
EA-MG6-BZ2(P)**

Panel only

Enclosure

1.2
[30.0]
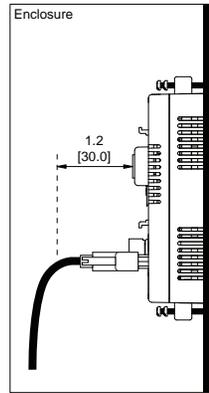
EA1-S6ML(W)

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

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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:

- Operating System - Windows® XP Home / Professional Edition Service Pack 2, Windows® 2000 with Service Pack 4, Windows® Vista (32 and 64 bit), Windows® 7 (32 and 64 bit), Windows 8 (32 and 64 bit)

- 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

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.

1
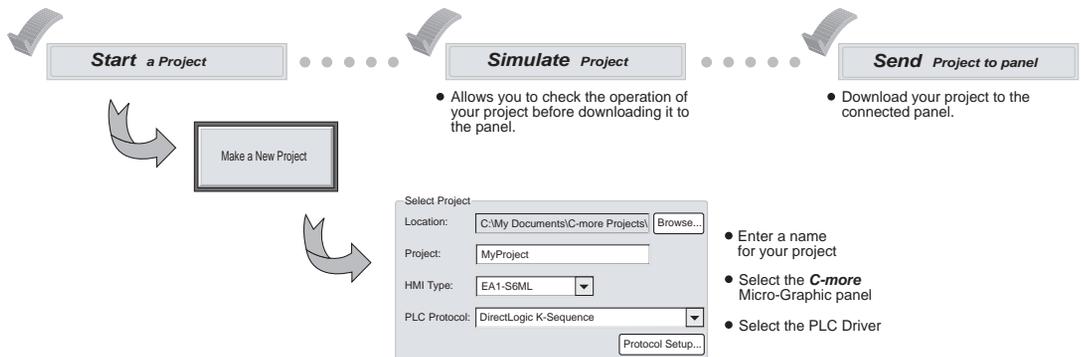
Step 6 – Connect *C-more* 6" Micro-Graphic Panel to Computer

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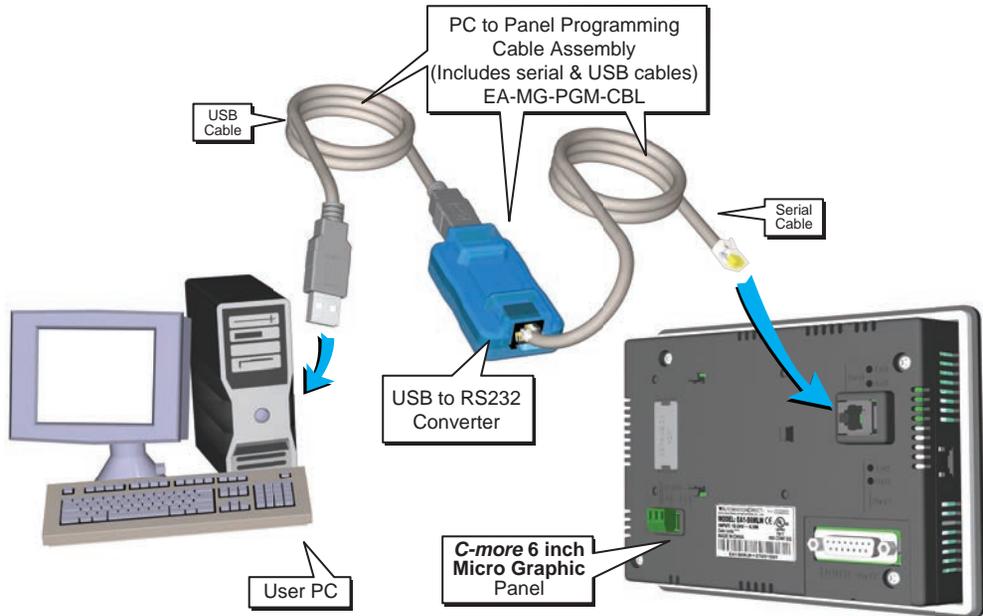
> **NOTE:** *When the panel is powered through Port1 from a connected PLC or PC, the screen brightness is diminished because the panel is running in **Low-Power Mode**. For full brightness, connect an external 12-24 VDC power source to the panel's power connection. **Low-Power Mode** is intended for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

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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 two different ways.

1.) During operation, the panel functions in High-Power Mode when powered by a minimum 1 Amp 12 - 24 VDC class 2 power source. Recommended power supplies are AutomationDirect part number PSC-24-015 or PSC-24-030.

2.) The *C-more* Micro-Graphic panel is powered during programming from the PC through the USB to RS-232 Programming Cable Assembly, EA-MG-PGM-CBL. The panel will operate in Low-power mode when powered by the PC and result in a dim screen.

3.) Optionally, the *C-more* Micro-Graphic panel can function in Low-Power Mode powered from most *AutomationDirect* PLC's RJ12 serial communications port. Use a DV-1000CBL communications cable, or a DV-1000CBL communications cable with a FA-15HD 15-pin HD DSub/RJ12 Adapter connected to most AutomationDirect PLC's 15-pin HD communications port (DL06, D2-250-1 & D2-260) PLCs for Low-Power operation. See **Chapter 6: PLC Communications** for additional details. The panel will operate in low-power mode when powered by the PC.

*Panel Powered from AutomationDirect PLC via Communications Cable

Power Supplied to Panel through Cable from AutomationDirect PLC RJ12 port: RS-232C (p/n DV-1000CBL)

To PLC RJ12 Port — To *C-more* Micro-Graphic Serial Port1

10 feet [3.0 m] Maximum

Wiring Diagram

RJ12 6-pin Phone Plug (6P6C)
1 = Sig GND
2 = +5 VDC
3 = RXD
4 = TXD
5 = not used
6 = Sig GND

GND 6 → 1 GND
TXD 4 → 3 RXD
RXD 3 → 4 TXD
+5 V 2 → 5 +5 V
GND 1 → 6 GND

RJ12 6-pin Phone Plug (6P6C)
1 = Sig GND
2 = not used
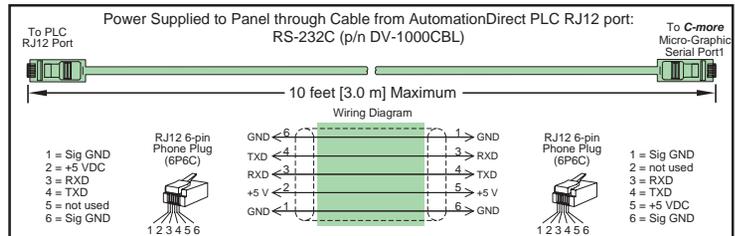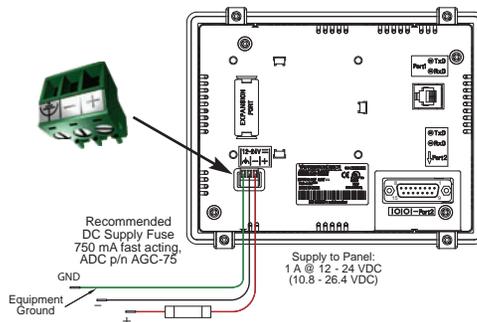3 = RXD
4 = TXD
5 = +5 VDC
6 = Sig GND

1 2 3 4 5 6

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 class 2 power source when the panel is installed in its application.*

Panel Powered from a DC Power Source - Wiring Diagram

Recommended DC Supply Fuse 750 mA fast acting, ADC p/n AGC-75

GND

Equipment Ground

Supply to Panel: 1 A @ 12 - 24 VDC (10.8 - 26.4 VDC)

NOTE: *Recommended DC power supply to power the C-more Micro-Graphic Panel, **AutomationDirect** Part No. PSC-24-015 or PSC-24-030.*

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Step 8 – Accessing the *C-more* 6" Micro-Graphic Panel Setup Screens
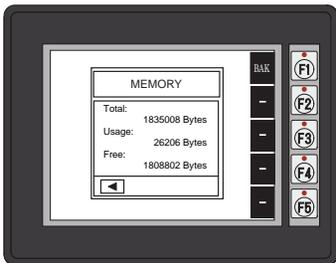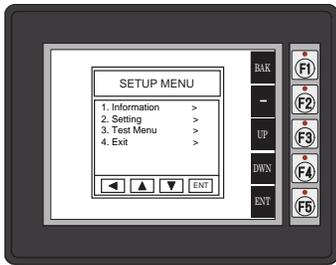
To access the **Setup Menu** of the panel's setup screens, press the the BAK [F1] and ENT [F5] function keys simultaneously for three (3) seconds.

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

Setup Menu [pg. 5-5]		
1. Information [pg. 5-6]	1. Memory [pg. 5-6]	
	2. Protocol [pg. 5-6]	
	3. Extensions [pg. 5-6]	
	4. Versions [pg. 5-6]	
2. Setting [pg. 5-7]	1. LCD Contrast [pg. 5-7]	
	2. Backlight [pg. 5-8]	
	3. Beep [pg. 5-10]	
	4. Calibration [pg. 5-11]	
	5. Clear User Memory [pg. 5-12]	
	6. Reset to Factory Default [pg. 5-12]	
	7. Hourglass [pg. 5-13]	
	8. Rotation [pg. 5-14]	
3. Test Menu [pg. 5-15]	1. Serial Port1 – Loop Back Test [pg. 5-15]	
	2. Serial Port2 – Loop Back Test [pg. 5-16]	
	3. PLC Enquiry Test [pg. 5-17]	
	4. Buzzer Test [pg. 5-17]	
	5. Touch Panel Test [pg. 5-18]	
4. Exit [pg. 5-18]	Do you want to exit from System Screen? No[F1] / Yes[F5]	

SETUP MENU

1. Information   >
2. Setting   >
3. Test Menu   >
4. Exit   >

BAK (F1)
– (F2)
UP (F3)
DWN (F4)
ENT (F5)

◄ ▲ ▼ ENT

MEMORY

Total:
          1835008 Bytes
Usage:
          26206 Bytes
Free:
          1808802 Bytes

◄

BAK (F1)
– (F2)
– (F3)
– (F4)
– (F5)

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

Available PLC Protocols

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

Available purchased cables

Cable Description	Cable Part No.
Cables used with serial Port1	
AutomationDirect Productivity Series, Do-more, CLICK, *Direct*LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	**DV-1000CBL**
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.	
*Direct*LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	**D4-1000CBL**
*Direct*LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) **Use with DV-1000CBL cable.**	**FA-15HD**
*Direct*LOGIC PLC 15-pin D-sub port, DL405 (RS-232C).	**FA-CABKIT**
*Direct*LOGIC PLC RJ-11 port, D3-340 (RS-232C).	**OP-3CBL-1**

Cable Description	Cable Part No.
Cables used with serial Port2	
AutomationDirect Productivity Series, Do-more, CLICK, *Direct*LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	**EA-2CBL**
*Direct*LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C).	**EA-2CBL-1**
*Direct*LOGIC PLC RJ-11 port, D3-340 (RS-232C).	**EA-3CBL**
*Direct*LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C).	**EA-4CBL-1**
*Direct*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, 1400 & 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**

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.

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

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

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

C-more **6 Inch Micro-Graphic** Panel

CLICK PLC

Port 1

Port 2

DV-1000CBL serial cable

C-more **6 Inch Micro-Graphic** Panel

DL-06 PLC

Recommended DC Supply Fuse 750 mA fast acting, ADC p/n AGC-75

Port 2

Port 2

PSC-24-015 Power Supply

EA-2CBL-1 serial cable

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