AVG UTICOR
PowerPanel™ Touchscreen Operator Interface
Instruction & Operation Manual

Sales and Marketing ▼
343 St. Paul Blvd.
Carol Stream, IL 60188
Tel: (630)668-3900
FAX: (630)668-4676

Factory Customer Service/Order Entry ▼
4140 Utica Ridge Rd.
Bettendorf, IA 52722
Tel: (319)359-7501
(800)711-5109
FAX: (319)359-9094

Application Hotline
1 (800) TEC-ENGR (832-3647)

Vist our web site at: www.avg.net

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PowerPanel™
Hardware *user's manual*

WARNING

In the application of AVG Automation programmable control devices, you should consider them components. Therefore, provisions other than the programmable control device must be taken to protect personnel in the event of a programmable control device malfunction. Programmable control devices should not be used as stand-alone protection in any application. Unless proper safeguards are used, unwanted start-ups could result in equipment damage or personal injury. If programmable controllers are used with operator interface and like devices, this hazard should be of primary importance. The operator should be made aware of this hazard and appropriate precautions should be taken.

In addition, consideration should be given to the use of an emergency stop function that is independent of the programmable controller.

The diagrams and examples in this user's manual are included for illustrative purposes only. The manufacturer cannot assume responsibility or liability for actual use based on the diagrams and examples.

WARNING

If the PowerPanel is used in a CLASS I, DIV. 2 environment, the following conditions must be met: Class I, Div. 2 methods; AND — must conform to all rules and requirements of applicable jurisdictions regarding Class I, Div. 2 installations; ALSO — peripheral equipment controlling this device or being controlled by it shall be suitable for service in the location in which they are used. *Failure to comply with any of the above installation requirements will invalidate the device's qualifications for service in CLASS I, DIV. 2 hazardous locations.*

CAUTION
Do not press the PowerPanel touchscreen with any sharp objects. This practice may damage the unit irreparably.

PowerPanel™
by AVG

MANUFACTURING
4140 Utica Ridge Rd. • Bettendorf, IA 52722-1327 UTICOR

CUSTOMER SERVICE / SALES / MARKETING / ADMINISTRATION
343 St. Paul Blvd. • Carol Stream, IL 60188

Application HOTLINE: **1-800-TEC-ENGR (832-3647)** • Phone: **630-668-3900** • Fax: **630-668-4676**

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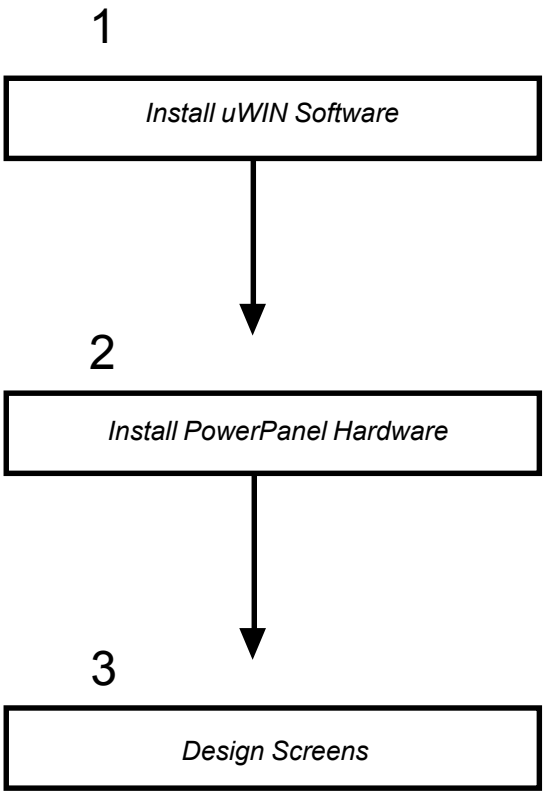
1 Getting Started

1.1 Manual Organization

There are *two manuals* that you will need to use the PowerPanel — this manual, the PowerPanel Hardware User's Manual, and the *u*WIN Software User's Manual (P/N 79769). Don't worry — you won't be bouncing back and forth between them — and we'll always let you know exactly where the information is that you will need for the next step.

Easy as 1- 2 - 3

These manuals will take you through the steps necessary to get your PowerPanel up and running in the shortest possible time. Although your familiarity with programmable graphic operator interface devices will determine how quickly you move through the steps — it's as easy as 1 — 2 — 3. The flow chart below will show you where you need to go, and — how to get there from here!



*u*WIN is a user-friendly Windows-based program that allows you to design screens for the PowerPanel series of operator interfaces. To install *u*WIN Software, run install program from Disk 1 and follow the onscreen prompts. For more information, please refer to Section 6 of this manual or the *u*WIN *Software Manual*.

Please note that you can start designing your screen offline immediately after installing uWIN — you don't need to have the hardware installed!

Section 2 (page 17) of this manual will provide you with the instructions you need to install the PowerPanel. Included are mounting dimensions (Section 2.1), wiring requirements and DIP switch settings (Section 2.2), and communication setup instructions (Section 2.3). This manual **primarily** addresses the installation of your PowerPanel.

You may design your screen online or offline (without connection to a PowerPanel). When designing screens with *u*WIN, you will place graphics and objects to display data and provide tools for communicating with the PowerPanel — all unique to your particular application. For instructions on how to design screens, refer to the *u*WIN*Software Manual*.

1.2 What you need to get started:

Hardware

- PowerPanel
- RS-232C or RS-422A/485A interface cable (RS-232C or RS-422A in 5" Color) (RS-232C only in 6" Monochrome LCD)
- Power lead
- PC requirements:
  - — IBM or compatible PC (486 or better) with a mouse and separate serial port
  - — VGA display
  - — 4 MBytes (8 MBytes recommended)
  - — Windows 3.x
- Hardware and Software Manuals

Software

- PowerPanel *u*WIN Programming Software (10F64)

1.3 Need HELP?

Onscreen Help

One of the most important features of the PowerPanel's *u*WIN Programming Software is the availability of onscreen help. To access the help windows, simply press the F1 function key while on the topic where you need help. For example, if you need help while working with base screens, hit the F1 function key while in that area and a pop-up window will be displayed. If you need further assistance refer to the section in the manual discussing that particular topic.

Fly-Over Help

When the mouse cursor comes to rest over any toolbar or toolbox button for a short while, a small yellow window will appear containing a brief description of the function of that particular button. The window will disappear as soon as the cursor has been moved off the button.

1.4 Still Need HELP?

Technical Support

Although most questions can be answered with *u*WIN HELP or the manuals, if you are still having difficulty with a particular aspect of installation or setup, technical support is available, call us at **1-800-TEC-ENGR (843-3647)** or FAX us at **1-630-688-4676)**. Visit our website at ***www.AVG.net.***

1.5 Introduction to the PowerPanel

AVG UTICOR's PowerPanel programmable graphics interface is an intelligent, flat panel display. It has been designed to interchange and display graphical data from a PLC by merely touching the screen.

The PowerPanel is available in several models with different sizes and display types. They include:

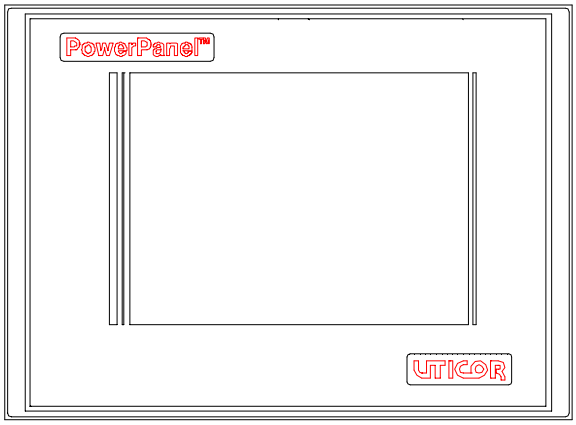
- 5" Monochrome LCD Model
- 5" Monochrome with Backlight Model
- 5" Active Color Model
- 5" Passive Color Model
- 6" Monochrome LCD Model
- 8" Passive Color Model
- 9" Monochrome EL Model
- 10.4" EL Color Model
- 10.4" Active Color Model
- 10.4" Passive Color Model
- 10.4" High-Bright Color Model

In addition to direct PLC and printer interfacing, the PowerPanel features a standard built-in, real-time clock. The PowerPanel is programmed with CAD-like software developed by UTICOR.

The PowerPanel will replace pilot lights, pushbuttons, selector and thumbwheel switches, panel meters, timers and counters, access modules, annunciators and programmable displays. The PowerPanel represents the next generation of display interface technology.

FEATURES

- **direct PLC connection**
- **compact size**
- **three levels of gray scale or full color**
- **easy-to-use software**
- **alarm messages**
- **custom or standard symbols and icons**
- **create charts and graphs**



Optional Interfaces

Important NOTE:

PowerPanel Passive Color 5" and 10.4" Models require version C.3 or later of *u*WIN Software (P/N 10F64) to program the PowerPanel correctly. Please contact our application department at 1-800-TEC-ENGR if you need the updated version of uWIN.

Programmable Logic Controllers (PLC)
All models of the PowerPanel will communicate with Programmable Logic Controllers. Many PLC types can be handled with the built-in PLC port serial on the PowerPanel. Some PLC types (e.g., Allen Bradley Remote I/O, GE Genius) require special hardware to enable communications with their bus. All PowerPanel models, except the 5" Monochrome LCD units, can be ordered with an optional PLC interface board.

PLC communications are addressed in detail in *u*WIN® Software (P/N 10F64) Help Screens. To access these PLC help screens within *u*WIN:

a. Run *u*WIN Programming Software (see section 6 in this manual.)

b. Open an existing or create a new “project” in *u*WIN.

c. Open the Base Screen containing the Main Menu.

d. On Main Programming Screen Menu Bar, click on **File>Project Setup>PLC>Select.** A dialog box entitled “**Select PLC**” will appear.

e. Click on **Help button**. A list of PLC types will appear. Select from this list and Help will provide the information you require to continue programming your PowerPanel.

For more information, you will need to follow the instructions in your *u*WIN Software User’s Manual (P/N 79769)

Add-on Keyboards
The 9" and 10.4" Models can be ordered with an optional Add-on Keyboard that plugs into a modular connector on the bottom of the unit. (See Section 4, *Accessories, Replacement Parts and Maintenance* for keyboard dimensions.)

Operation and Programming

The PowerPanel’s compact size is deceiving — although small, it is able to withstand stringent industrial applications. The PowerPanel also meets NEMA 4 or NEMA 4X standards. Before you begin programming your PowerPanel, there are a few basic rules you should know to understand how the unit works. There are many layers of operation and features in the PowerPanel that enable it to work efficiently and effectively. This section will guide you through the fundamental layers and give you a basic understanding of how the PowerPanel works. Section 6 provides instructions on how to load *u*WIN Programming Software, however, for in depth instructions, you will need to consult the *u*WIN *Software User’s Manual* or *u*WIN Help.

There are three basic components of the PowerPanel that are necessary for operation: Graphics, Triggers, and Register Mapping.

Graphics are used for the benefit of the operator. Their function is to display data and/or objects in an area for the operator to see.

Important NOTE:

All screens can have over 4K of user memory. The amount of memory used in each screen will determine the total number of screens you can program.

Triggers are used for the benefit of the PowerPanel. Their function is to tell the PowerPanel what to do, for example: display data in a register, turn on a bit or write a value to a register.

Register Mapping is unique to AVG UTICOR PowerPanels. The PowerPanel has 2,048 16-Bit Registers. The first 1,024 registers may be used for mapping a PLC. Registers 1,025 through 2,048 may only be used as internal register. These registers are what the triggers read and write to. The registers are mapped (assigned PLC addresses by the user) to read and write.

Example: PowerPanel register 25 can be mapped to an Allen-Bradley Integer file N7:3. In this example, all 16 bits of register 25 all mapped to all 16 bits in N7:3 where PowerPanel bit 0 equals A-B bit 0 and PowerPanel bit 15 equals A-B bit 15. Depending on the PLC there may be some restrictions on writing to certain addresses, please refer to your PLC Manual or *u*WIN Help for specific information.

Important NOTE:

"Busy" Message — you will receive a "Busy" message on your display when switching screens to indicate that your PowerPanel is "busy" working on the screen switch.

Other areas you need to be familiar with are the different screen types. They are: **Base, Library, Symbol, Keypad, LineGraph, Report, Alarm, and Message screens**. Each screen is unique in handling the capabilities of the PowerPanel. Here we will cover the two basic and most used screens, Base and Library. See the *uWIN Software User's Manual* for more information.

Base Screens are the only screen type to be displayed. Anything created in other screen types have to be *included* into a Base screen to be displayed. Base screens, as with most other screen types, are numbered 1–999.

Library Screens are typically programmed with one object in them (e.g., a pushbutton, indicator, or text.) The idea is to draw something once and include or copy it over and over onto other screens. This is your library of objects. UTICOR supplies a number of pushbuttons, keyboards, etc., that maybe *merged* into your file. The file is named "library1" and is included in your *u*WIN software.

Inputs and Outputs

PowerPanel screen inputs are displayed as symbols, numerical fields, charts and graphs, or text. Outputs are changed by using touchscreen triggers or external keypads on certain PowerPanels. Triggers monitor and set internal register values. They allow you to select how data will be displayed. In addition, triggers allow you to enter new data values. The operator or controlling device can display new screens according to their application.

In addition, the unit can be programmed online or offline. The programming software runs on IBM PCs or compatibles and requires a mouse.

Specifications for all types of PowerPanels are included on the following pages for easy reference. Make a note of your type unit's power requirements, special features, or limitations.

1.6 PowerPanel Hardware Specifications

5" Monochrome LCD

Display Type:	5" monochrome, reflective, super twist, passive LCD display (no back light)
Display Size:	3.75 x 2.8" (95.3 x 71.1 mm)
Screen Pixels:	320 x 240
Touchscreen:	48 resistive touch cells (8 x 6)
Service Power:	20 – 32 VDC Input
Power Consumption:	< 6W, Fuse – 0.5 Amp Slow Blow
Enclosure:	NEMA 4
Operating Temperature:	32 to 104 °F (0 to 40 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 Kbytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
Serial Interface:	**Com Port 1** – RS-232C, RS-422A, RS-485A **PLC Port** – RS-232C, RS-422A, RS-485A or current loop **AUX Port and the Com Port 2 are not available**

5" Monochrome with Backlight

Display Type:	5" monochrome, reflective, super twist, passive LCD display with backlight
Display Size:	3.75 x 2.8" (95.3 x 71.1 mm)
Screen Pixels:	320 x 240
Touch Screen:	48 resistive touch cells (8 x 6) 40 x 40 pixel area
Service Power:	20 – 32 VDC Input
Power Consumption:	< 7W Fuse – 0.75 Amp Slow Blow
Enclosure:	NEMA 4
Operating Temperature:	32 to 104 °F (0 to 40 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
Serial Interface:	**Com Port 1** – RS-232C, RS-422A, RS-485A **PLC Port** – RS-232C, RS-422A, RS-485A or current loop **AUX Port and the Com Port 2 are not available.**

5" Active Color

Display Type:	5" Active Color Model
Display Size:	4.04 x 3.03" (102.6 x 77 mm)
Screen Pixels:	320 x 240
Touchscreen:	48 resistive touch cells (8 x 6)
Service Power:	21.6 – 32 VDC Input
Power Consumption:	24 VDC – 18 W, Fuse – 1.5 Amp – 24 VDC
Enclosure:	NEMA 4
Operating Temperature:	32 to 131 °F (0 to 55 °C)
Storage Temperature:	-40 to +167 °F (-40 to 75 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A **Extra Printer** – RS-232C, RS-422A **PLC Port** – RS-232C, RS-422A **Com Port 2** – RS-422A

Note: When the unit is in RS-422A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

5" Passive Color

Display Type:	5" Passive Color Model
Display Size:	4.04 x 3.03" (102.6 x 77 mm)
Screen Pixels:	320 x 240
Touchscreen:	48 resistive touch cells (8 x 6)
Service Power:	21.6 – 32 VDC Input
Power Consumption:	24 VDC – 18 W, Fuse – 1.5 Amp – 24 VDC
Enclosure:	NEMA 4
Operating Temperature:	32 to 122 °F (0 to 50° C)
Storage Temperature:	-40 to +149 °F (-40 to +65 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A **Extra Printer** – RS-232C, RS-422A **PLC Port** – RS-232C, RS-422A **Com Port 2** – RS-422A

Note: When the unit is in RS-422A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

6" Monochrome LCD

Display Type:	6" Monochrome LCD Model – 3 levels of grayscale
Display Size:	4.7 x 3.5" (119.4 x 88.9 mm)
Screen Pixels:	320 x 240
Touchscreen:	48 resistive touch cells (8 x 6)
Service Power:	21.6 – 32 VDC Input
Power Consumption:	24 VDC – 12 W, Fuse – 0.75 Amp – 24 VDC
Enclosure:	NEMA 4
Operating Temperature:	32 to 104 °F (0 to 40 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** –- RS-232C **Extra Printer** – RS-232C, RS-422A/485A **PLC Port** – RS-232C, RS-422A/485A, Current Loop **Com Port 2** – RS-422A

Note: When the unit is in RS-422A/485A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

8" Color

Display Type:	8" Passive Color Model
Display Size:	6.315" x 4.768" (160.4 x 121.1 mm)
Screen Pixels:	640 x 480
Touch Screen:	192 resistive touch cells (16 x 12)
Service Power:	21.6 – 32 VDC Input
Power Consumption:	24 VDC < 24W Fuse – 1.5 Amp Slow Blow 1.0 Amp @ 24 VDC
Enclosure:	NEMA 4
Operating Temperature:	32 to 104 °F (0 to 40 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc, ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Burn-In:	All products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 Kbytes, Battery backup
Real-Time Clock:	Standard — +1, -2 min. per month error maximum
PLC Interface:	Direct Register Access
Serial Interface:	**Com Port 1** – RS-232C, RS-422A **PLC Port** – RS-232C, RS-422A, RS-485A **Com Port 2** – RS-422A **Extra Printer** – RS-232C, RS-422A/485A

Note: When the unit is in RS-422A/485A mode, the RD (receive data) lines may be terminated by 120 Ohms through the user accessible switch selection.

9" Monochrome

Display Type:	9" Monochrome EL Model – Amber Electroluminescent (EL) flat panel
Display Size:	7.7 x 4.8" (195.6 x 121.9 mm)
Screen Pixels:	640 x 400
Touchscreen:	160 resistive touch cells (16 x 10)
Service Power:	115/230 VAC/DC or 24 VDC
Power Consumption:	115/230 VAC/DC < 40 VA, Fuse: 1 Amp – 115/230 VAC/DC 24 VDC 1.25 Amps < 40 VA, Fuse: 2 Amps – 24 VDC
Enclosure:	NEMA 4X
Operating Temperature:	32 to 140 °F (0 to 60 °C)
Storage Temperature:	-40 to +167 °F (-40 to 75 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Vibration:	Vertical axis only (normal installation position) **Frequency:** 5 to 500 Hz **Sweep Time:** 11 min. (6 sweeps) **Amplitude:** 1.000 inch **Maximum Acceleration:** 1.5 Gs
Shock:	Vertical axis only (force down) **Acceleration:** 40 Gs **Duration:** 11 msec. **Waveform:** Half sine wave **No of impacts:** 10
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes or 512K RAM or Flash, Battery backup
Real-Time Clock:	Standard — +30, -60 sec. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A/485A **Extra Printer** – RS-232C, RS-422A/485A **PLC Port** – RS-232C, RS-422A/485A **Com Port 2** – RS-422A/485A

Note: When the unit is in RS-422/485 mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

10.4" EL Color

Display Type:	10.4" Color EL Model – Amber Electroluminescent (EL) flat panel – 8 colors
Display Size:	8.3 x 6.2" (210.8 x 157.5 mm)
Screen Pixels:	640 x 480
Touchscreen:	192 resistive touch cells (16 x 12)
Service Power:	115/230 VAC/DC or 24 VDC
Power Consumption:	115/230 VAC/DC < 40 VA, Fuse: 1 Amp – 115/230 VAC/DC 24 VDC 1.25 Amps < 40 VA, Fuse: 2 Amps 24 VDC
Enclosure:	NEMA 4X
Operating Temperature:	32 to 140 °F (0 to 60 °C)
Storage Temperature:	-40 to +167 °F (-40 to 75 °C)
Humidity:	10-95% R.H. non-condensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Vibration:	Vertical axis only (normal installation position) **Frequency:** 5 to 500 Hz **Sweep Time:** 11 min. (6 sweeps) **Amplitude:** 1.000 inch **Maximum Acceleration:** 1.5 Gs
Shock:	Vertical axis only (force down) **Acceleration:** 40 Gs **Duration:** 11 msec. **Waveform:** Half sine wave **No of impacts:** 10
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes or 512K RAM or Flash, Battery backup
Real-Time Clock:	Standard — +30, -60 sec. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A/485A **Extra Printer** – RS-232C, RS-422A/485A **PLC Port** – RS-232C, RS-422A/485A **Com Port 2** – RS-422A/485A

Note: When the unit is in RS-422A/485A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

10.4" Active Color

Display Type:	10.4" Color Model – Active Matrix LCD 16 color
Display Size:	8.3 x 6.2" (210.8 x 157.5 mm)
Screen Pixels:	640 x 480
Touchscreen:	192 resistive touch cells (16 x 12)
Service Power:	115/230 VAC/DC or 24 VDC
Power Consumption:	115/230 VAC/DC < 40 VA, Fuse: 1 Amp - 115/230 VAC/DC 24 VDC 1.25 Amps < 40 VA, Fuse: 2 Amp - 24 VDC
Enclosure:	NEMA 4X
Operating Temperature:	32 to 113 °F (0 to 45 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Vibration:	Vertical axis only (normal installation position) **Frequency:** 5 to 500 Hz **Sweep Time:** 11 min. (6 sweeps) **Amplitude:** 1.000 inch **Maximum Acceleration:** 1.5 Gs
Shock:	Vertical axis only (force down) **Acceleration:** 40 Gs **Duration:** 11 msec. **Waveform:** Half sine wave **No of impacts:** 10
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes or 512K RAM or Flash, Battery backup
Real-Time Clock:	Standard — +30, -60 sec. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A/485A **Extra Printer** – RS-232C, RS-422A/485A **PLC Port** – RS-232C, RS-422A/485A **Com Port 2** – RS-422A/485A

Note: When the unit is in RS-422A/485A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

10.4" Passive Color and 10.4" High-Bright Color

Display Type:	10.4" (diagonal) Passive Color Model – 16 colors 10.4" (diagonal) High-Bright Color Model – 16 colors
Display Size:	8.3 x 6.2" (210.8 x 157.5 mm)
Display Brightness:	**Passive Color:** 150 NITS; **High-Bright Color:** 1,500 NITS
Screen Pixels:	640 x 480
Touchscreen:	192 resistive touch cells (16 x 12)
Service Power:	115/230 VAC/DC or 24 VDC
Power Consumption:	**Passive Color:** 115/230 VAC/DC < 40 VA, Fuse: 1 Amp - 115/230 VAC/DC 24 VDC 1.25 Amps < 40 VA, Fuse: 2 Amp - 24 VDC **High-Bright Color:** 115/230 VAC/DC <65 VA, Fuse: 1.5 Amp
Enclosure:	NEMA 4X
Operating Temperature:	32 to 113 °F (0 to 45 °C)
Storage Temperature:	-4 to +140 °F (-20 to +60 °C)
Humidity:	10-95% R.H., noncondensing
Electrical Noise Tolerance:	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test
Vibration:	Vertical axis only (normal installation position) **Frequency:** 5 to 500 Hz **Sweep Time:** 11 min. (6 sweeps) **Amplitude:** 1.000 inch **Maximum Acceleration:** 1.5 Gs
Shock:	Vertical axis only (force down) **Acceleration:** 40 Gs **Duration:** 11 msec. **Waveform:** Half sine wave **No of impacts:** 10
Burn-In:	All UTICOR products are temperature cycled 96 hours and then are fully, functionally tested.
User Memory:	256 KBytes or 512K RAM or Flash, Battery backup
Real-Time Clock:	Standard — +30, -60 sec. per month error maximum
PLC Interface:	Direct Register Access (program port or remote I/O)
Serial Interface:	**Com Port 1** – RS-232C, RS-422A/485A **Extra Printer** – RS-232C, RS-422A/485A **PLC Port** – RS-232C, RS-422A/485A **Com Port 2** – RS-422A/485A

Note: When the unit is in RS-422A/485A mode, the RD (receive data) lines may be terminated by 150 Ohms through the user accessible switch selection.

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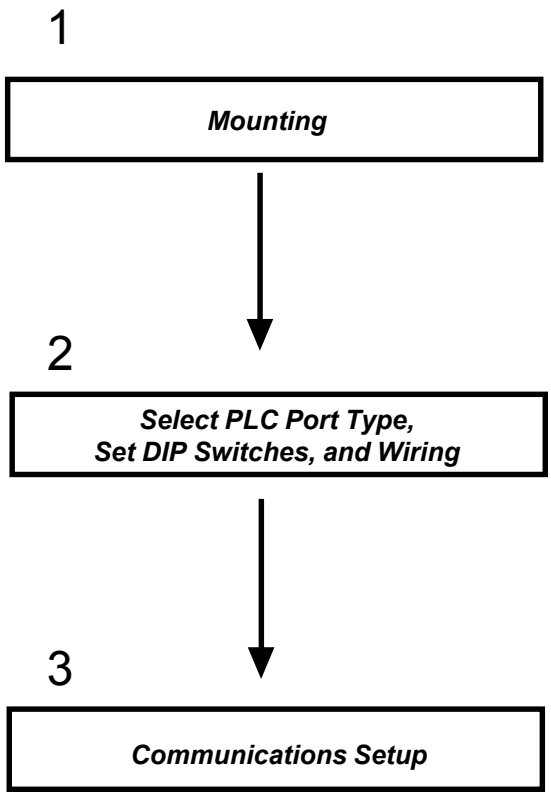
2 Installation

Installing the PowerPanel requires the following three major steps:



The PowerPanel is a front-panel mount unit. Mounting of the unit requires a panel cutout, and drilling holes for the mounting screws. Please see the following section 2.1, page 18, for dimensions.

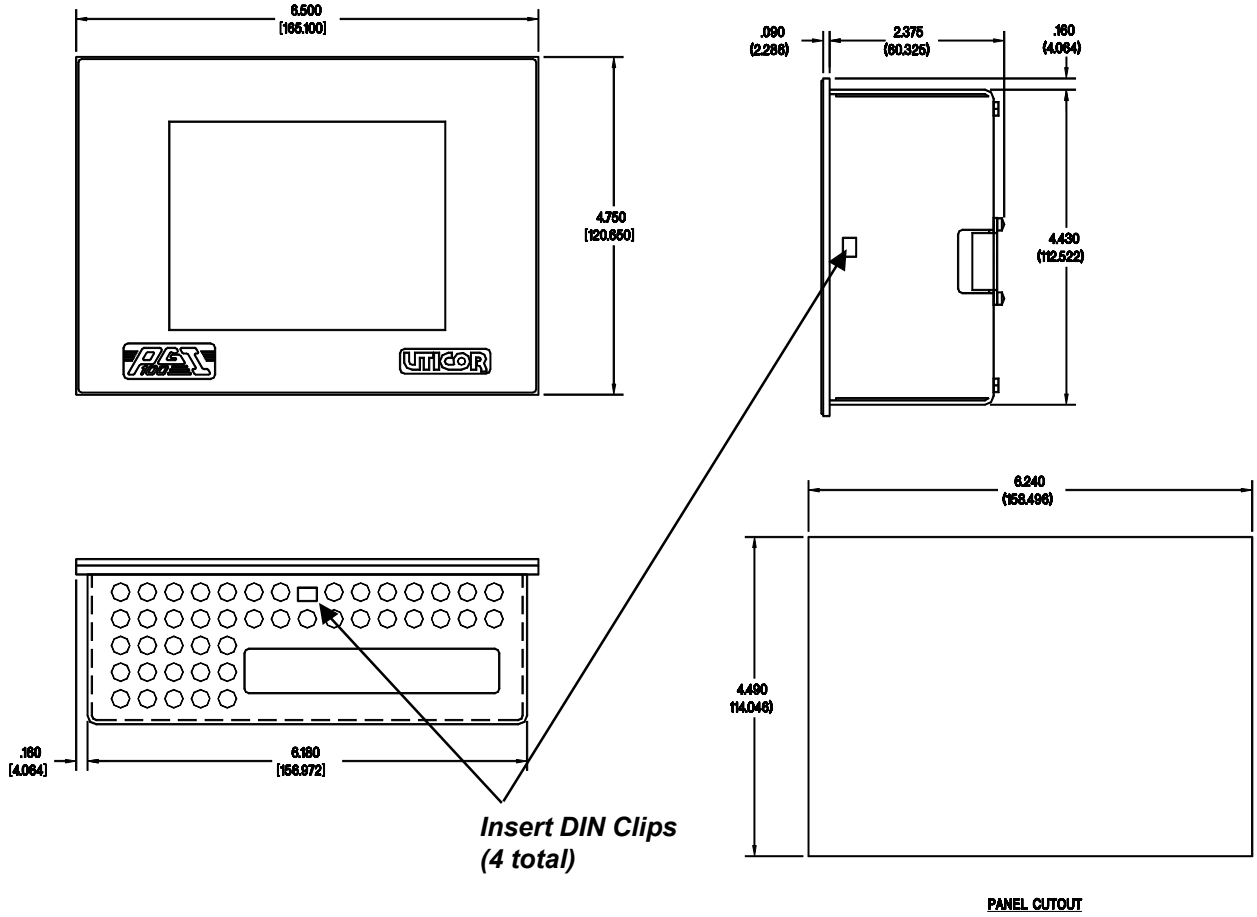
Now that your PowerPanel is mounted, you are ready to select your PLC Port Type, set the DIP switches and wire the unit. The PowerPanel's PLC Port supports RS-232C, RS-422A and RS-485A connections. Based on your PLC's requirements, set DIP Switches on the back of the unit to select appropriate port type. Note whether your type PowerPanel is an AC or DC powered unit. See the following section 2.2, beginning on page 25 for further information.

The PowerPanel has some user-defined parameters, such as, communication settings (Baud Rate, Parity, etc.) The unit is shipped with factory default values for these parameters. Check default settings (provided in section 2.3, page 41, this manual) To change any value, please enter "SET-UP MODE" on power-up and follow the procedures provided in section 2.3, beginning on page 39.

2.1 PowerPanel Mounting

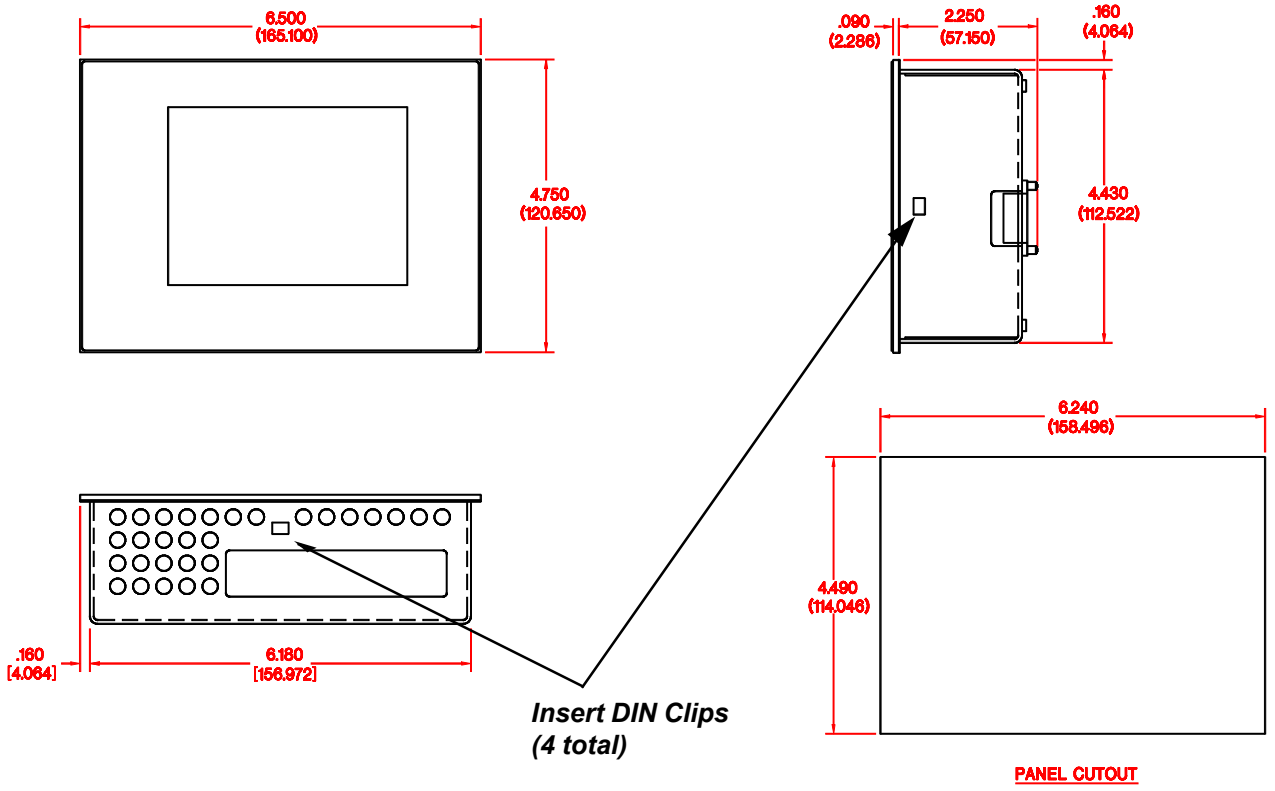
Use the following outline dimensions and cutout to mount the PowerPanel. All the necessary mounting hardware is provided with the unit. The 5" Monochrome units are secured to the mounting surface with the use of 4 DIN clips and screws. See bottom of next page (19) for DIN clip installation.

5" Monochrome LCD Outline Dimensions & Cutout



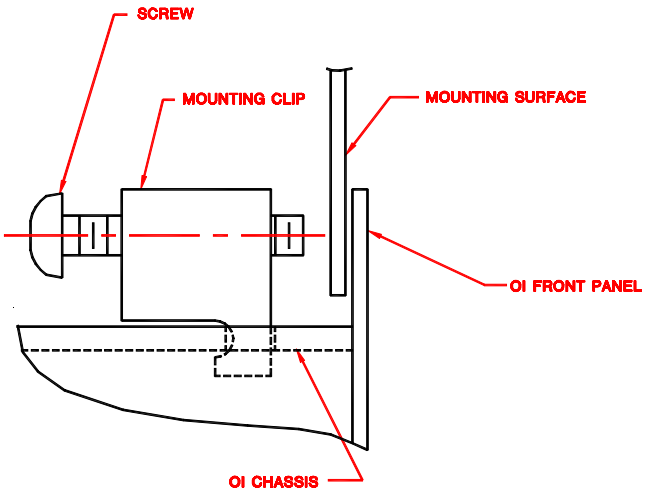
5" Monochrome with Backlight Outline Dimensions & Cutout

The monochrome unit is secured to the mounting surface with the use of 4 DIN clips and screws. See below for DIN clip installation.



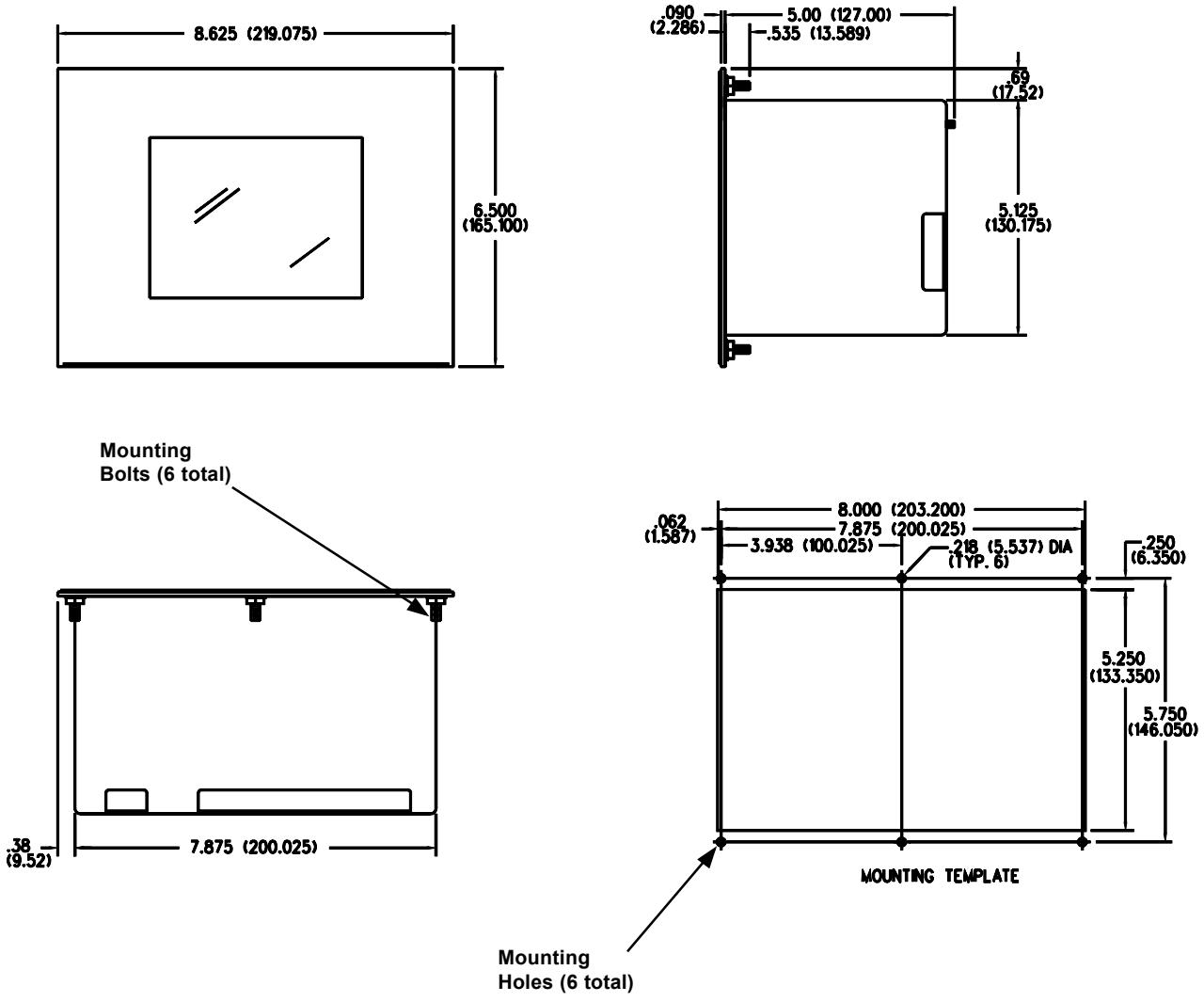
DIN Clip Installation for the 5" Monochrome and 5" Monochrome with Backlight

There are 4 square holes in the 5" Monochrome PowerPanel chassis for DIN clip installation. The figure to the right shows how to install the DIN clips into the chassis and how they are designed to secure the PowerPanel to the mounting surface.



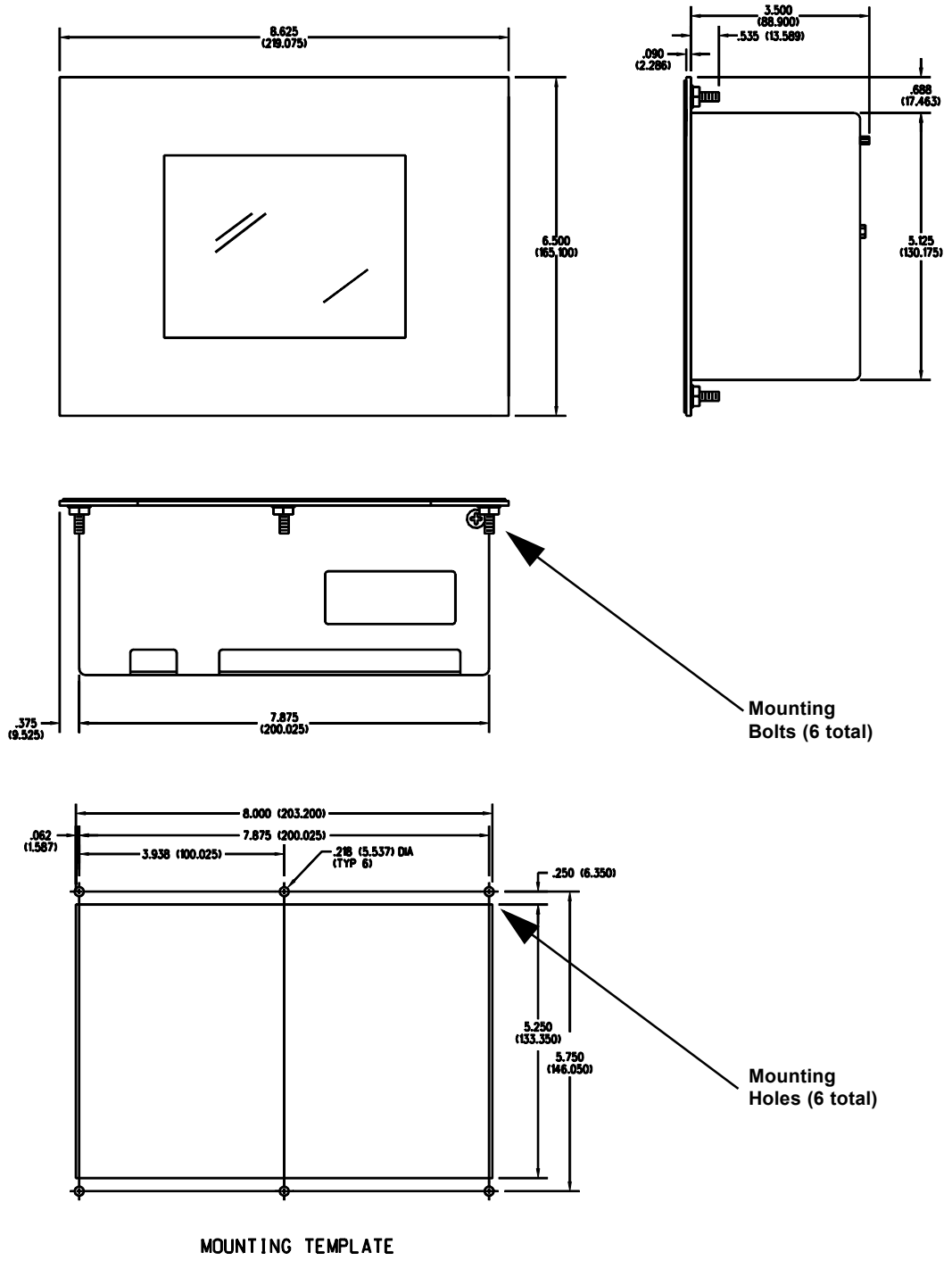
5" Active Color Outline Dimensions & Cutout

Use the 6 studs and 6 nuts with captive washers to secure the unit to the mounting surface.



6" Monochrome LCD Outline Dimensions & Cutout

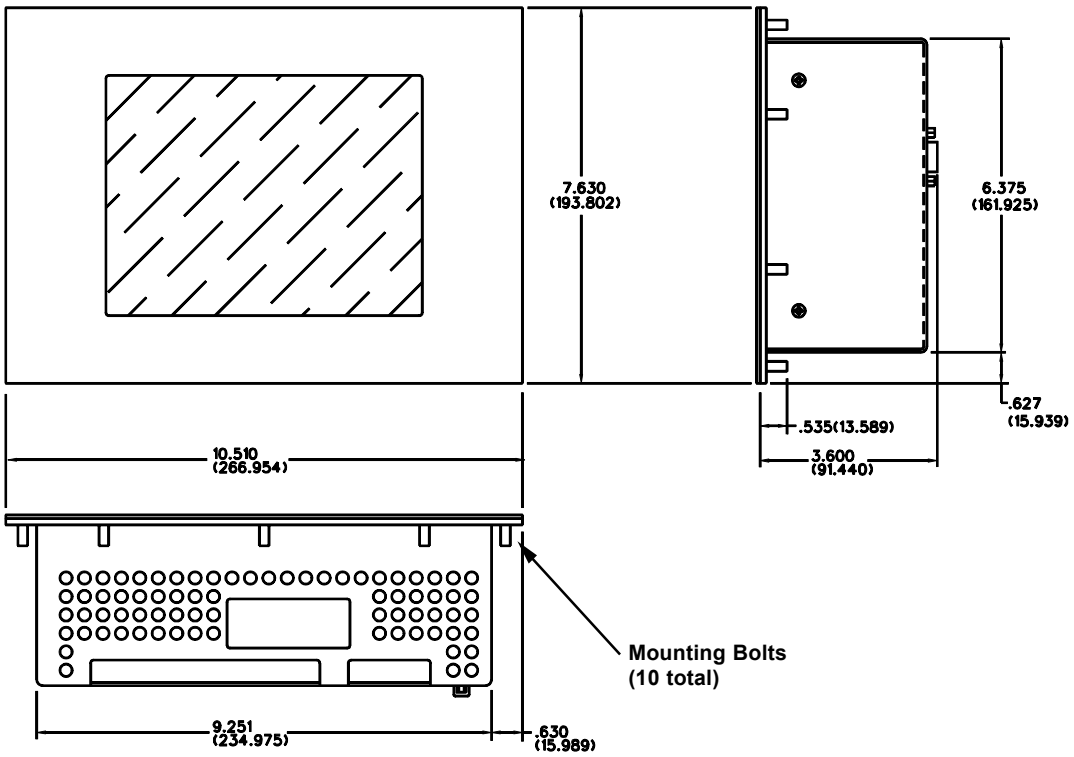
Use the 6 bolts and 6 nuts with captive washers to secure the unit to the mounting surface.

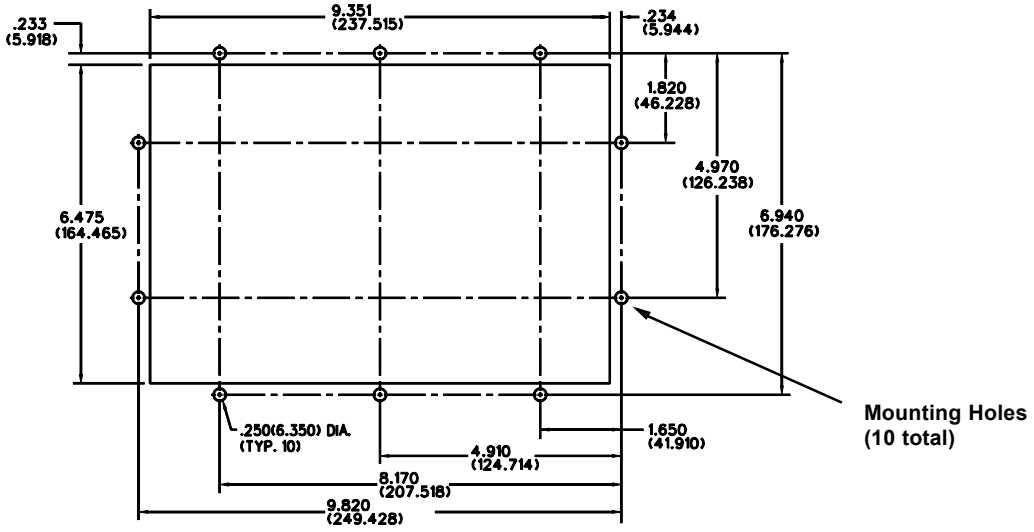


MOUNTING TEMPLATE

8" Color Outline Dimensions & Cutout

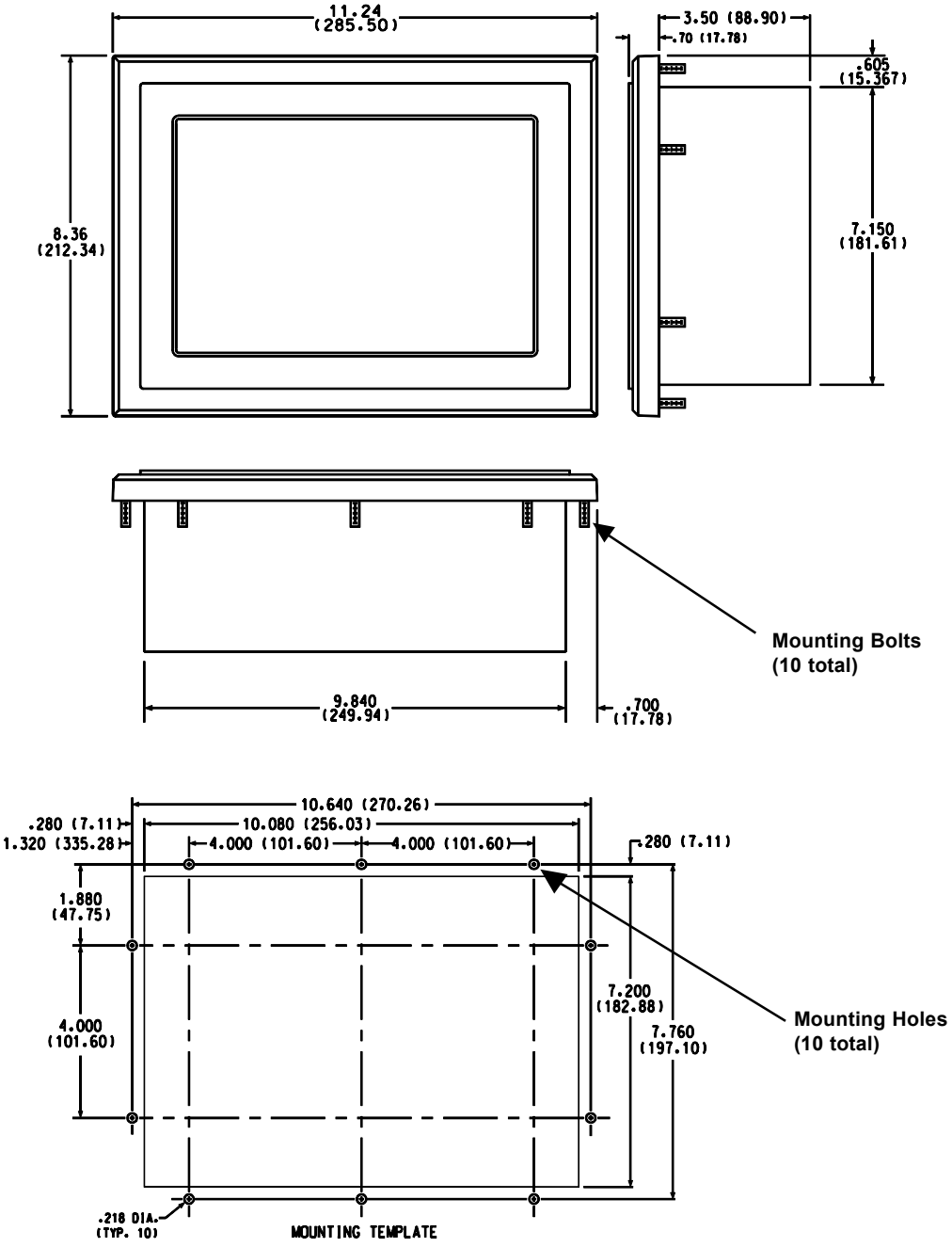
All the necessary mounting hardware is provided with the unit. Use the 10 screws and 10 nuts with captive washers to secure the unit to the mounting surface.





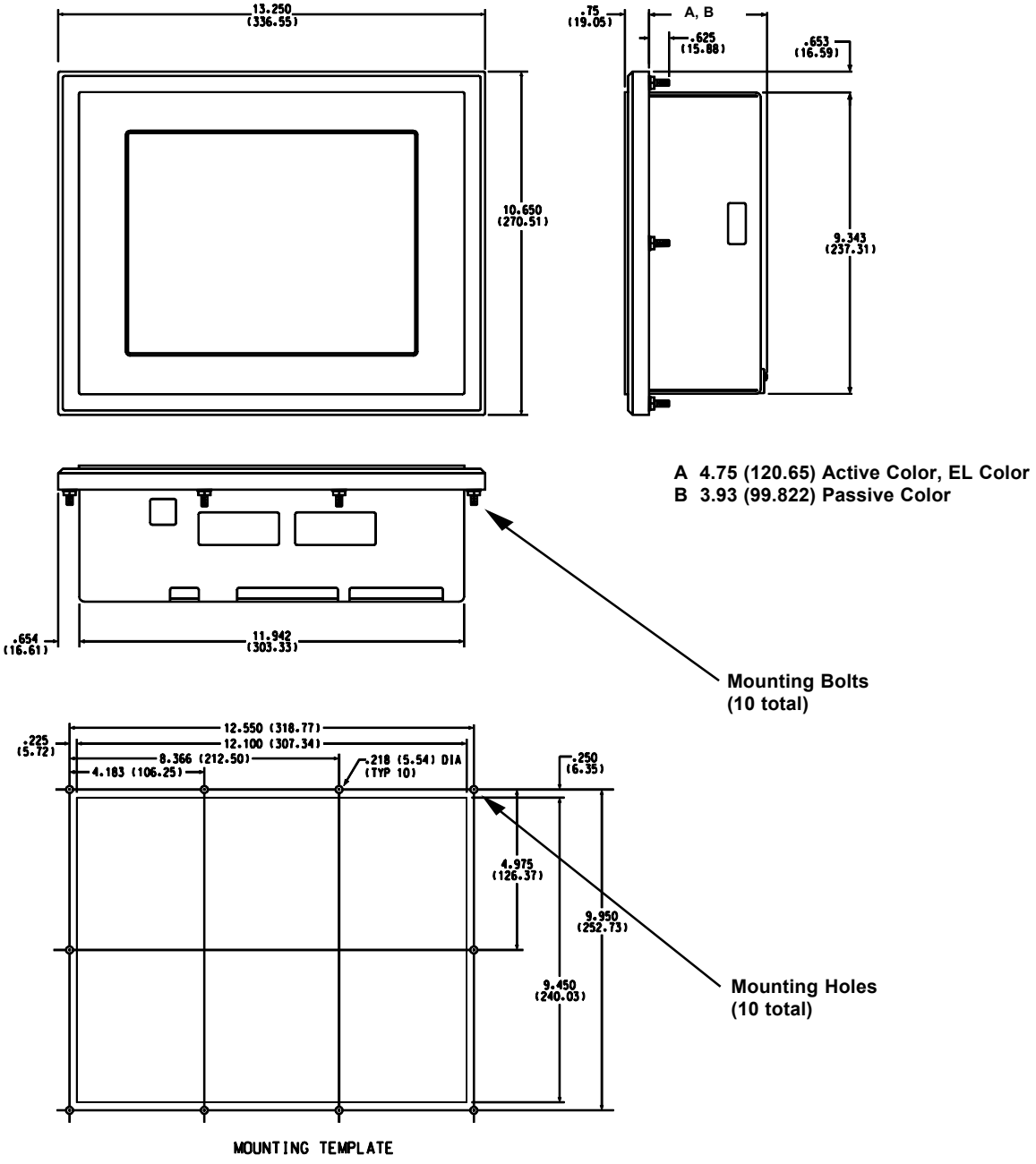
9" Monochrome Outline Dimensions & Cutout

All the necessary mounting hardware is provided with the unit. Use the 10 screws and 10 nuts with captive washers to secure the unit to the mounting surface.



10.4" Active Color, El Color, and Passive Color Outline Dimensions and Cutout

All the necessary mounting hardware is provided with the unit. Use the 10 screws and 10 nuts with captive washers to secure the unit to the mounting surface.

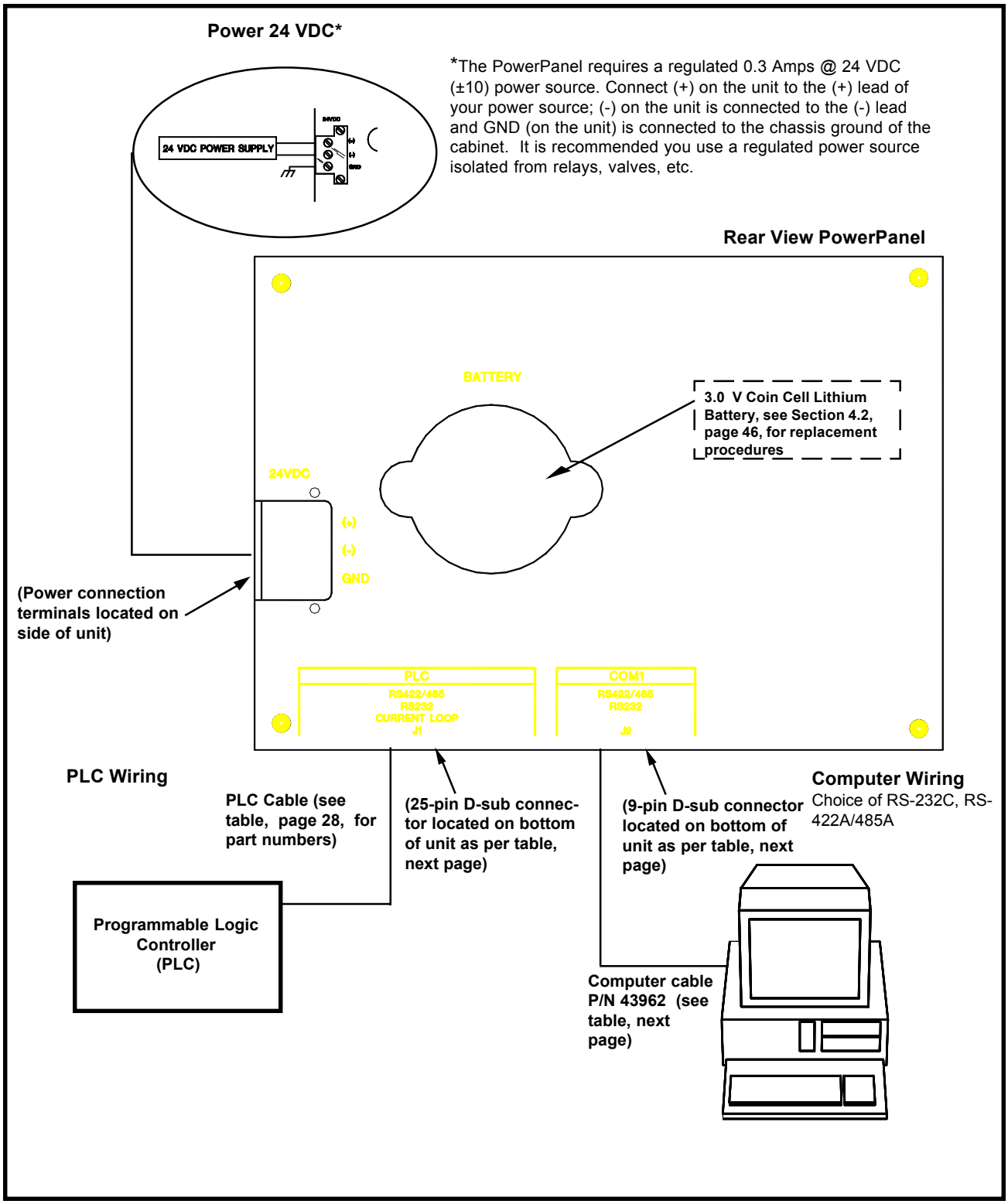


2.2 PowerPanel Wiring

On the following pages the wiring is described for the various display types. The table below will tell you the page number where wiring information for a particular display type is provided.

	Page(s)			
Display Type	**Wiring Diagram**	**DIP Switch Settings/Pin**	**PLC Cable Part Nos.**	**PC and Peripheral Device Connection**
5" Monochrome LCD Model	26	27	28	29
5" Monochrome with Backlight Model	26	27	28	29
5" Active Color Model	30	32-33	37	38
5" Passive Color Model	30	32-33	37	38
6" Monochrome LCD Model	30	32-33	37	38
8" Passive Color Model	31	32-33	37	38
9" Monochrome EL Model	34	35-36	37	38
10.4" EL Color Model	34	35-36	37	38
10.4" Active Color Model	34	35-36	37	38
10.4" Passive Color Model	34	35-36	37	38
10.4" High-Bright Color Model	34	35-36	37	38

5" MONOCHROME AND 5" MONOCHROME WITH BACKLIGHT — WIRING DIAGRAM



5" MONOCHROME MODELS — SELECT PLC PORT TYPE — PIN CONNECTIONS

CAUTION

To keep the PowerPanel's size small, yet provide flexibility in PLC connections, a single 25-pin connector is used to provide RS-232C, RS-422A, and RS-485A signals. The table below describes the pin connections for these signals. Please be careful to connect the correct pins for your PLC interface. DO NOT CONNECT THE PINS LABELED "DO NOT USE" — to do so may cause damage to your equipment.

When connecting to a PLC, see the PowerPanel wiring diagrams in *u*WIN HELP. Wiring diagrams to your particular PLC are only available in *u*WIN HELP. For instructions on on how to access *u*WIN HELP, see Section 6. The PowerPanel supports RS-232C, RS-422A and RS-485A types of ports. Check the type of port required by your PLC, and then use the following table when constructing the cable to make the pin connections for your type PLC. Match PLC signal names with Power Panel signal names when constructing the cable. Use the table, ***PLC Cable Part Numbers***, on page 28, to determine the cable required with your type PLC.

PLC Port PIN Connections Table

<table>
<tr><th>Port</th><th>Pin Number</th><th>RS-232</th><th>RS-422</th><th>RS-485</th></tr>
<tr><td rowspan="25">PLC</td><td>Pin 1</td><td>Safety Ground</td><td>Safety Ground</td><td>Safety Ground</td></tr>
<tr><td>Pin 2</td><td>TxD</td><td>Do not use</td><td rowspan="4">Do not use</td></tr>
<tr><td>Pin 3</td><td>RxD</td><td rowspan="3">Do not use</td></tr>
<tr><td>Pin 4</td><td>RTS</td></tr>
<tr><td>Pin 5</td><td>CTS</td></tr>
<tr><td>Pin 6</td><td>Do not use</td><td>LE</td><td>LE</td></tr>
<tr><td>Pin 7</td><td>GND</td><td>GND</td><td>GND</td></tr>
<tr><td>Pin 8</td><td rowspan="14">Do not use</td><td>Do not use</td><td>Do not use</td></tr>
<tr><td>Pin 9</td><td>RD+</td><td>RD+ (connect to SD+, Pin 11)</td></tr>
<tr><td>Pin 10</td><td>Connect to RD+, Pin 9 to enable 150 ohm termination resistor for RD signal</td><td>Connect to RD+, Pin 9 to enable 150 ohm termination resistor for RD signal</td></tr>
<tr><td>Pin 11</td><td>SD+</td><td>SD+(connect to RD+, Pin 9)</td></tr>
<tr><td>Pin 12</td><td rowspan="2">Do not use</td><td rowspan="2">Do not use</td></tr>
<tr><td>Pin 13</td></tr>
<tr><td>Pin 14</td><td>+5V</td><td>+5V</td></tr>
<tr><td>Pin 15</td><td>SD-</td><td>SD- (connect to RD-, Pin 16)</td></tr>
<tr><td>Pin 16</td><td>RD-</td><td>RD- (connect to SD-, Pin 15)</td></tr>
<tr><td>Pin 17</td><td rowspan="2">Do not use</td><td rowspan="2">Do not use</td></tr>
<tr><td>Pins 18-22</td></tr>
<tr><td>Pin 23</td><td colspan="3">Ext. Beeper GND (Common with Logic GND)</td></tr>
<tr><td>Pin 24</td><td>Do not use</td><td>Do not use</td><td>Do not use</td></tr>
<tr><td>Pin 25</td><td colspan="3">Ext. Beeper (NPN sinking output -- 50mA max. current, 30 max. voltage</td></tr>
</table>

5" MONOCHROME MODELS — PLC CABLE PART NUMBERS

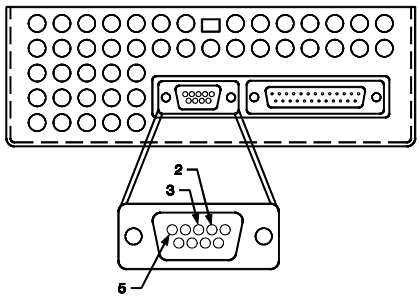
Cable Part #	PLC Manufacturer	PLC Model	PLC Connector Type
44359	Allen-Bradley	SLC500 Programming Port (DH-485A)	8-position phone plug w/shield
44360		SLC500 DF1 (RS-422A)	9-position female d-sub
44361		SLC500 DF1 (RS-232C)	9-position female d-sub
44362		SLC500 DF1 (RS-485A)	9-position female d-sub
44363		PLC5 DF1 (RS-485A)	25-position male d-sub
44364		SLC500 AIC Link Coupler Module (RS-485A)	8-position phone plug w/shield
44393	CTC	CTC 2200/2600 (RS-232C)	6-position modular phone-type plug
44365	General Electric	Series 90-30, 90-70 SNP, SNP-X	15-pin plug d-sub
44377	IDEC	FA2/FA2J/FA3S/FA25M (RS-232C)	25-position male d-sub
44386	Keyence	KV-10R, 10T, 16R, 16T, 24R, 24T, 40R, 40T, 80R, 80T, or 300 (RS-232C)	6-position modular phone-type plug
44373	Klockner-Moeller	PS 306/316 (RS-485A)	DIN 5-pin right-angle plug
44374		PS4 (RS-232C)	DIN 5-pin right-angle plug
44382	Koyo	DL305 Series (DL340/350), or DL405 Series (DL430/440/450) (RS-422A)	25-position male d-sub
44384		DL305 Series (DL330/330P/340/350), or DL405 Series (DL430/440/450)and D3-232-DCU Module (RS-232C)	25-position male d-sub
43151		DL205 Series (DL240/250), or DL405 Series (DL450) (RS-232C)	Phone jack type connector
44392	Mitsubishi	MELSEC FX Series Converter (RS-422A)	25-position male d-sub
44391		MELSEC FX Series Converter (RS-232C)	25-position male d-sub
44366	Modicon	Modbus (RS-232C)	9-position male d-sub
44398		AEG Modicon Micro	9-position male d-sub
44378		AEG Series A120 (RS-232C)	9-position male d-sub
44367	Omron	Host Link (RS-232C)	25-position male d-sub
44375	Reliance	Automate (RS-232C)	25-position male d-sub
44369	Siemens/TI	545 (RS-422A)	9-position male d-sub
44370		545 (RS-232C)	9-position female d-sub
44388		S7 HMI Adaptor (RS-232C)	9-position female d-sub
44368	Square D	SY/MAX (RS-422A)	9-position male d-sub
443171	Toshiba	Prosec T Series (RS-232C)	9-position male d-sub
44379		Prosec T Series (RS-422A)	15-position male d-sub
44371	UTICOR	Director 6001 PLC (RS-422A/485A)	9-position male d-sub
44372		Director 6001 PLC (RS-232C)	9-position male d-sub

5" MONOCHROME MODELS — COM1 PORT COMPUTER CONNECTION

The PowerPanel requires a computer connection for programming only. During normal operation, the computer need not be connected to the PowerPanel. The 5" Monochrome PowerPanel offers the choice of RS-232C, RS-422A or RS-485A for computer connection. Use the port that matches the type of port used in the programming PC to wire the PowerPanel. See the tables below for pin connections as they relate to port type.

There is no pin in this connector for chassis ground. You must connect chassis ground through the shell of the connector.

To make the cable for RS-232C connections, use the table below. Use *only* pins 2 (Receive Data), 3 (Transmit Data) and 5 (Signal GND) to connect RS-232C to your computer, use of other pins ***will*** cause communication problems.



RS-232 Pin Connections Table

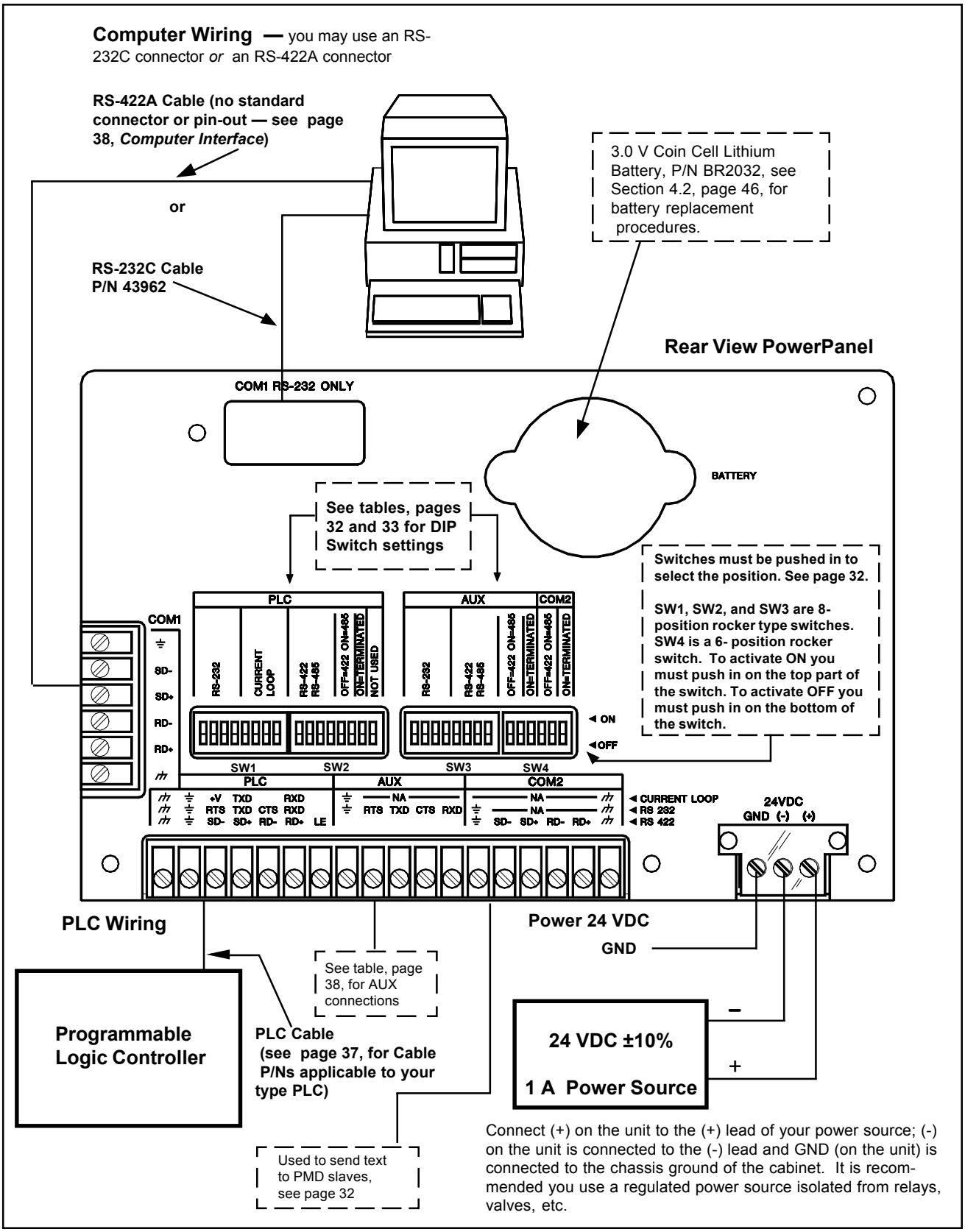
Function	PowerPanel 9-Pin DB	PC 9-Pin DB*	PC 25-Pin DB**	Function
TxD	2	2	3	RxD
RxD	3	3	2	TxD
GND	5	5	7	GND

* Pins 4, 6 and 8 loop the handshake back on the 9-Pin PC cable and should be jumpered.
** Pins 5, 6 and 20 loop the handshake back on the 25-Pin PC cable and should be jumpered.

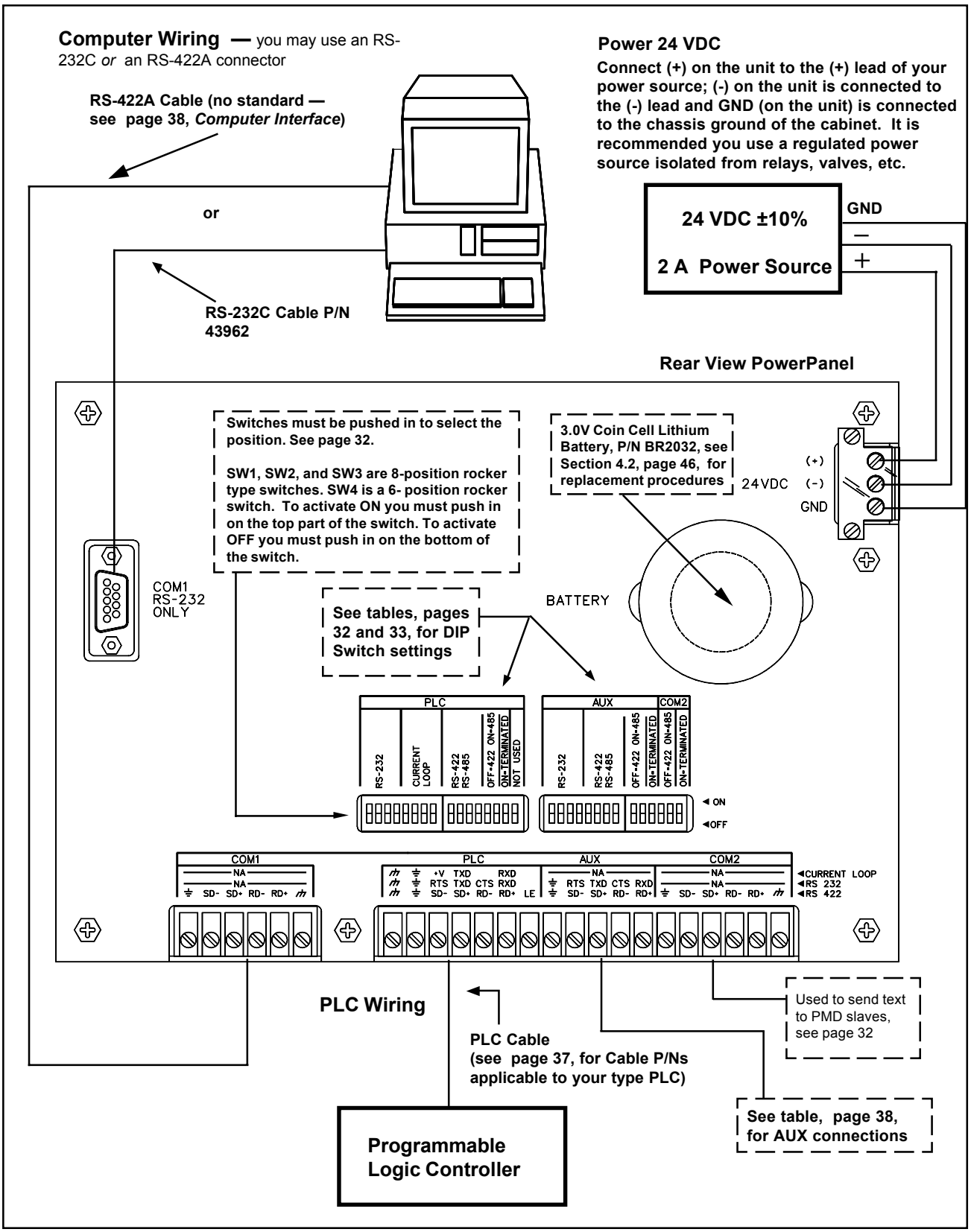
COM1 Port PIN Connections Table

Port	Pin Number	RS-232	RS-422	RS-485
COM1	Pin 1	Do not use	**SD-**	**SD- connect to pin 4 (RS-)**
	Pin 2	**TxD**	Do not use	Do not use
	Pin 3	**RxD**	Do not use	Do not use
	Pin 4	Do not use	**RD-**	**RD- connect to pin 1 (SD-)**
	Pin 5	**GND**	**GND**	**GND**
	Pin 6	Do not use	**SD+**	**SD+ connect to pin 9 (RD+)**
	Pin 7	**CTS**	Do not use	Do not use
	Pin 8	**RTS**	Do not use	Do not use
	Pin 9	Do not use	**RD+**	**RD+ connect to pin 2 (SD+)**

5" COLOR AND 6" MONOCHROME — WIRING DIAGRAM



8" COLOR — WIRING DIAGRAM

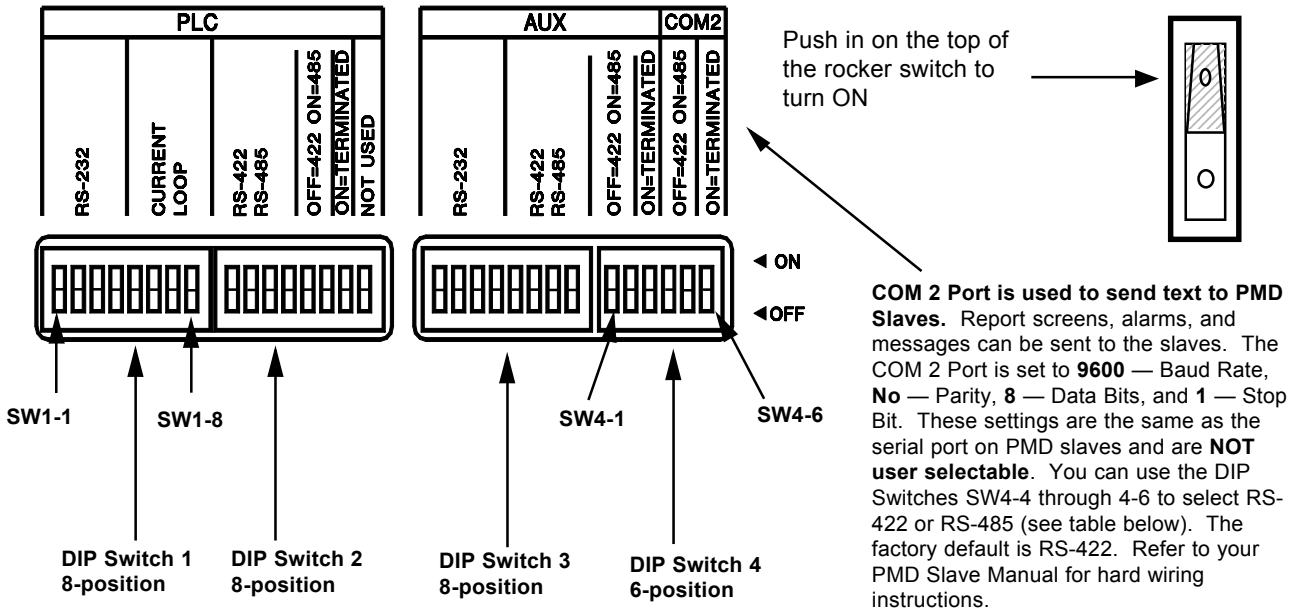


5" COLOR, 6" MONOCHROME, AND 8" COLOR — WIRING — DIP SWITCH SETTINGS

These are the DIP Switches on the rear of the 5" Color, 6" Monochrome and 8" Color PowerPanel. To set the DIP Switches for the type of connection you are using, refer to the tables beginning on the bottom of this page (32) and continuing on page 33.

Switches must be pushed in to select the position.

SW1, SW2, and SW3 are 8-position rocker-type switches. SW4 is a 6-position rocker switch. To activate ON you must push in on the top part of the switch. To activate OFF you must push in on the bottom of the switch.



COM 2 Port is used to send text to PMD Slaves. Report screens, alarms, and messages can be sent to the slaves. The COM 2 Port is set to **9600** — Baud Rate, **No** — Parity, **8** — Data Bits, and **1** — Stop Bit. These settings are the same as the serial port on PMD slaves and are **NOT user selectable**. You can use the DIP Switches SW4-4 through 4-6 to select RS-422 or RS-485 (see table below). The factory default is RS-422. Refer to your PMD Slave Manual for hard wiring instructions.

COM 1 Port

To set COM 1 Port as RS-422A, SW2-8 as "Termination." *
* "Termination," as used above and in the following tables, refers to 120 Ohm termination resistor option for use with RS-422A and RS-485A. Switch to ON to enable resistor.

COM 2 Port

To Set COM 2 (Port D) as:	Set DIP Switches as follows:		
	SW4-4	SW4-5	SW4-6
RS-422A	OFF		Termination
RS-485A	ON		Termination

5" COLOR, 6" MONOCHROME, AND 8" COLOR — WIRING — DIP SWITCH SETTINGS — *continued*

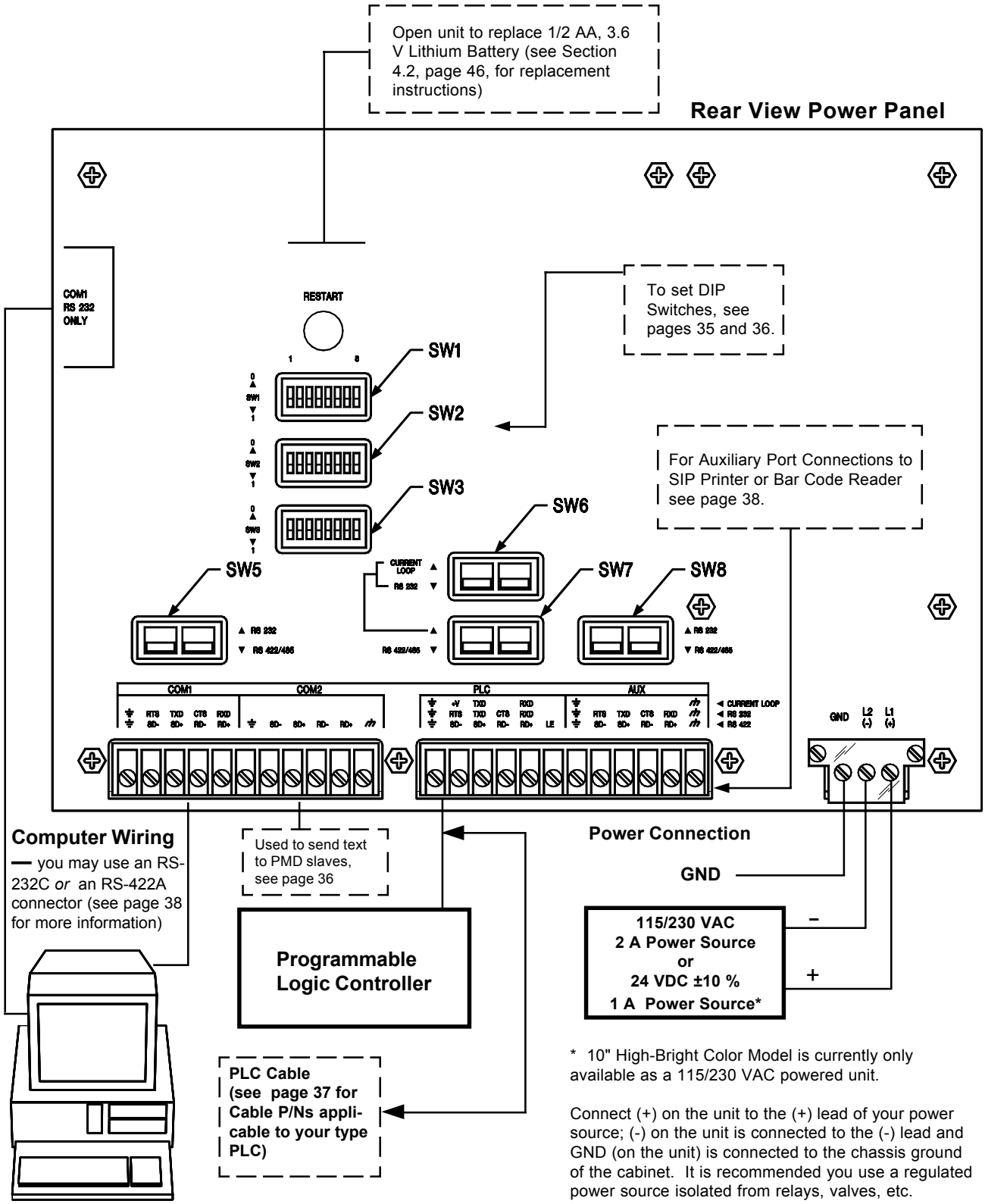
PLC Port

Set DIP Switches as follows:	*To set PLC COM (port C) as:*			
	Current Loop	**RS-232C**	**RS-422A**	**RS-485A**
SW1-1	OFF	ON	OFF	OFF
SW1-2				
SW1-3				
SW1-4				
SW1-5	ON	OFF		
SW1-6				
SW1-7				
SW1-8	OFF	ON	ON	ON
SW2-1	OFF	OFF	ON	ON
SW2-2				
SW2-3				
SW2-4				
SW2-5			OFF	
SW2-6				
SW2-7			Termination	Termination

AUX Port

Set DIP Switches as follows:	*To set AUX (Port B) as:*		
	RS-232C	**RS-422A**	**RS-485A**
SW3-1	ON	OFF	OFF
SW3-2			
SW3-3			
SW3-4			
SW3-5	OFF	ON	ON
SW3-6			
SW3-7			
SW3-8			
SW4-1	OFF	OFF	ON
SW4-2			
SW4-3		Termination	Termination

9" MONOCHROME AND ALL 10.4" COLOR MODELS — WIRING DIAGRAM

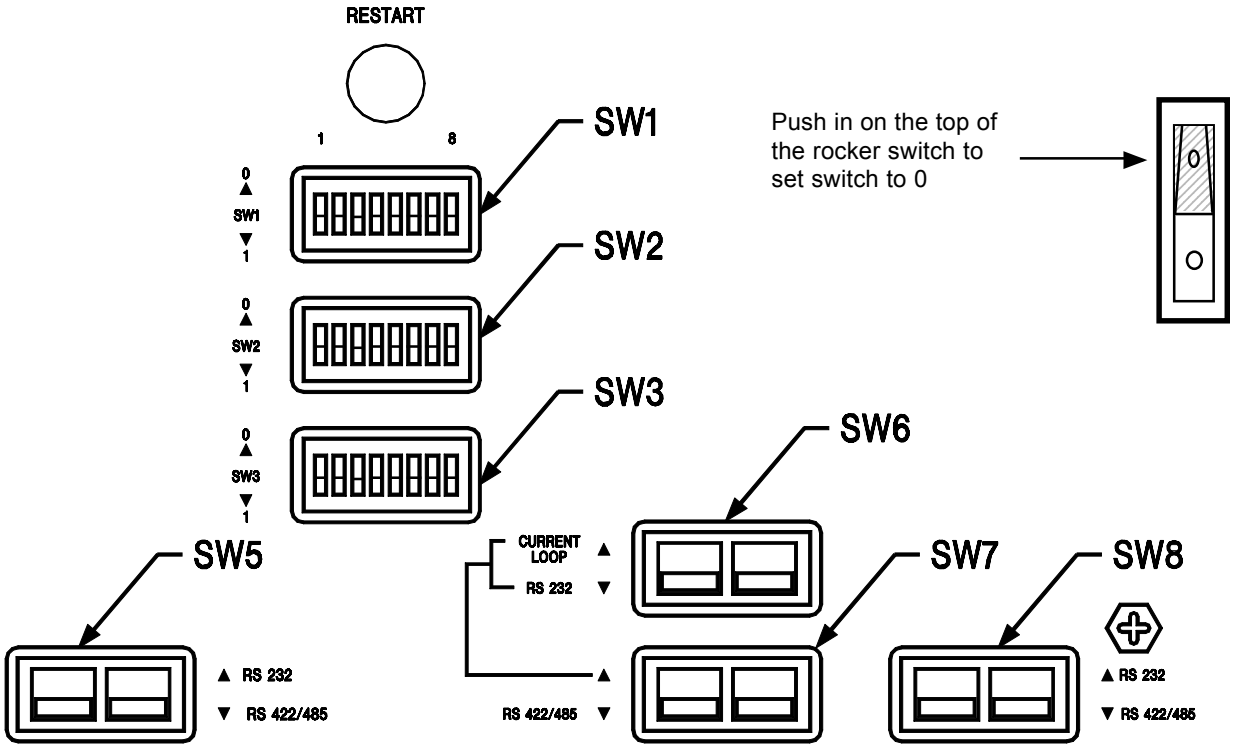


* 10" High-Bright Color Model is currently only available as a 115/230 VAC powered unit.

Connect (+) on the unit to the (+) lead of your power source; (-) on the unit is connected to the (-) lead and GND (on the unit) is connected to the chassis ground of the cabinet. It is recommended you use a regulated power source isolated from relays, valves, etc.

9" MONOCHROME AND ALL 10.4" COLOR MODELS — WIRING — DIP SWITCH SETTINGS

Switches must be pushed in to select the position. It is important to know that DIP switch SW1-1 is used to disable the setup mode on power up. Setup and run modes are enabled if the switch is in the 1 position. If the switch is set to 0 then the pushbuttons are not displayed. The switches are on the rear of the unit, as shown below. Use the table on the next page (36) to set DIP switches as required.



9" MONOCHROME AND ALL 10.4" COLOR MODELS — WIRING — DIP SWITCH SETTINGS — *continued*

For DIP Switch location, see Rear Panel View, page 34.

To set COM 1 Port as:	Set DIP Switches as follows:				
	SW2-1	SW3-1	SW3-2	SW5-1	SW5-2
RS-232C	1			RS-232C	
RS-422A	1			RS-422A/485A	
RS-485A (Not Terminated)	1	0		RS-422A/485A	
RS-485A (Terminated)	0			RS-422A/485A	

To set COM 2 Port as:	Set DIP Switches as follows:		
	SW2-4	SW3-7	SW3-8
RS-422A	1		
RS-485A (Not Terminated)	1	0	
RS-485A (Terminated)	0		

COM 2 Port is used to send text to PMD Slaves. Report screens, alarms, and messages can be sent to the slaves. The COM 2 Port is set to **9600** — Baud Rate, **No** — Parity, **8** — Data Bits, and **1** — Stop Bit. These settings are the same as the serial port on PMD slaves and are NOT user selectable. You can use the DIP Switches SW2-4, SW3-7, and SW3-8 to select RS-422 or RS-485 (see table below). The factory default is RS-422. **Refer to your PMD Slave Manual for hard wiring instructions.**

To set PLC Port as:	Set DIP Switches as follows:							
	SW2-3	SW2-8	SW3-5	SW3-6	SW6-1	SW6-2	SW7-1	SW7-2
RS-232C	1	0	1		RS-232C			
RS-422A	1	0	1		RS-232C		RS-422A	
RS-485A (Not Terminated)	1	0			RS-232C		RS-485A	
RS-485A (Terminated)	0				RS-232C		RS-485A	
Current Loop	1				Current Loop		RS-232C	

To set AUX Port as:	Set DIP Switches as follows:				
	SW2-2	SW3-3	SW3-4	SW8-1	SW8-2
RS-232C	1			RS-232C	
RS-422A	1			RS-422A	
RS-485A (Not Terminated)	1	0		RS-485A	
RS-485A (Terminated)	0			RS-485A	

PLEASE NOTE: For wiring diagram specific to your type PLC, consult μWIN Software HELP.

ALL POWERPANELS (EXCEPT 5" MONO) — PLC CABLE PART NUMBERS

Cable Part #	PLC Manufacturer	PLC Model	PLC Connector Type
43933	Allen-Bradley	SLC 500 Programming Port (DH-485A)	8-position phone plug w/shield
43976		SLC 500 DF1 (RS-422A)	9-position female d-sub
44314		SLC 500 DF1 (RS-232C)	9-position female d-sub
43978		SLC 500 DF1 (RS-485A)	9-position female d-sub
44313		PLC5 DF1 (RS-485A)	25-position male d-sub
43983		SLC500 AIC Link Coupler Module(RS-485A)	8-position phone plug w/shield
44394	CTC	CTC 2200/2600 (RS-232C)	6-position modular phone-type plug
43939	General Electric	Series 90-30, 90-70 SNP, SNP-X	15-pin plug d-sub
44315	IDEC	FA2/FA2J/FA3S/FA25M (RS-232C)	25-position male d-sub
44385	Keyence	KV-10R, 10T, 16R, 16T, 24R, 24T, 40R, 40T, 80R, 80T, or 300 (RS-232C)	6-position modular phone-type plug
43947	Klockner-Moeller	PS 306/316 (RS-485A)	DIN 5-pin right-angle plug
44307		PS4 (RS-232C)	DIN 5-pin right-angle plug
44381	Koyo	DL305 Series (DL340/350), or DL405 Series (DL430/440/450) (RS-422A)	25-position male d-sub
44383		DL305 Series (DL330/330P/340/350), or DL405 Series (DL430/440/450) D3-232-DCU Module (RS-232C)	25-position male d-sub
43150		DL205 Series (DL240/250), or DL 405 Series (DL450) (RS-232C)	6-position phone jack type connector
44390	Mitsubishi	MELSEC FX Series Converter (RS-422A)	25-position male d-sub
44389		MELSEC FX Series Converter (RS-232C)	25-position male d-sub
44312	Modicon	Modbus (RS-232C)	9-position male d-sub
44399		AEG Modicon Micro	9-position male d-sub
44318		AEG Series A120 (RS-232C)	9-position male d-sub
44311	Omron	Host Link (RS-232C)	25-position male d-sub
44309	Reliance	Automate (RS-232C)	25-position male d-sub
43970	Siemens/TI	545 (RS-422A)	9-position male d-sub
44310		545 (RS-232C)	9-position female d-sub
44387		S7 HMI Adaptor (RS-232C)	9-position female d-sub
43934	Square D	SY/MAX (RS-422A)	9-position male d-sub
44317	Toshiba	Prosec T Series (RS-232C)	9-position male d-sub
44316		Prosec T Series (RS-422A)	15-pin plug d-sub
44226	UTICOR	Director 6001 PLC (RS-422A/485A)	9-position male d-sub
44227		Director 6001 PLC (RS-232C)	9-position male d-sub

ALL POWERPANELS (EXCEPT THE 5" MONO) — WIRING — COMPUTER INTERFACE AND PERIPHERAL DEVICES

Computer Interface

The PowerPanel requires a computer connection for programming only. During normal operation, the computer need not be connected to the PowerPanel. The PowerPanels offer the choice of RS-232C and RS-422A for computer connection. Use the port that matches the type of port used in the programming PC to wire thePowerPanel. These models are equipped with a female RS-232C 9-pin d-subconnector (labeled COM1 RS-232 ONLY) on the rear(or side), upper-left corner, of the unit and screw terminal RS-422A (COM1) port located on the rear (orside), bottom-left corner, of the unit. The RS-232C 9-Pin Cable part number is 43962.

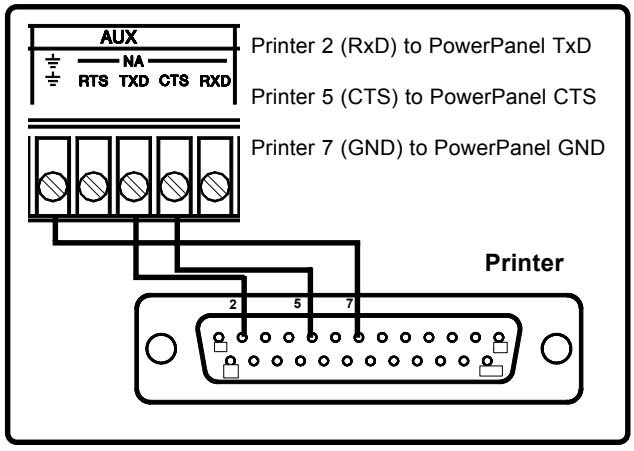
If you are using an RS-422A connector, use screw terminal connections (SD-, SD+, RD-, RD+). ***Because RS-422A has no standard connector defined, a cable will have to be constructed based on pinouts and the PC connector.***

Use *only* PowerPanel pins 2 (Receive Data), 3 (Transmit Data) and 5 (Signal GND) to connect RS-232C to your computer, use of other pins may cause communication problems. See table below.

Function	PowerPanel 9-Pin DB	PC 9-Pin DB*	PC 25-Pin DB**	Function
TxD	2	2	3	RxD
RxD	3	3	2	TxD
GND	5	5	7	GND

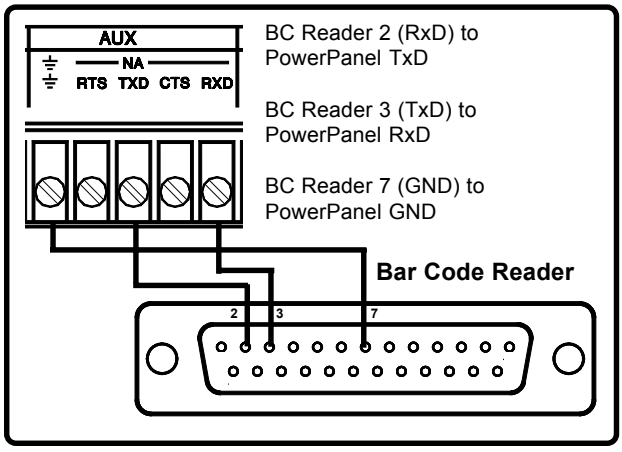
* Pins 4, 6 and 8 loop the handshake back on the 9-Pin PC cable and should be jumpered.
** Pins 5, 6 and 20 loop the handshake back on the 25-Pin PC cable and should be jumpered.

SIP Printer Connections



Bar Code Reader Connections

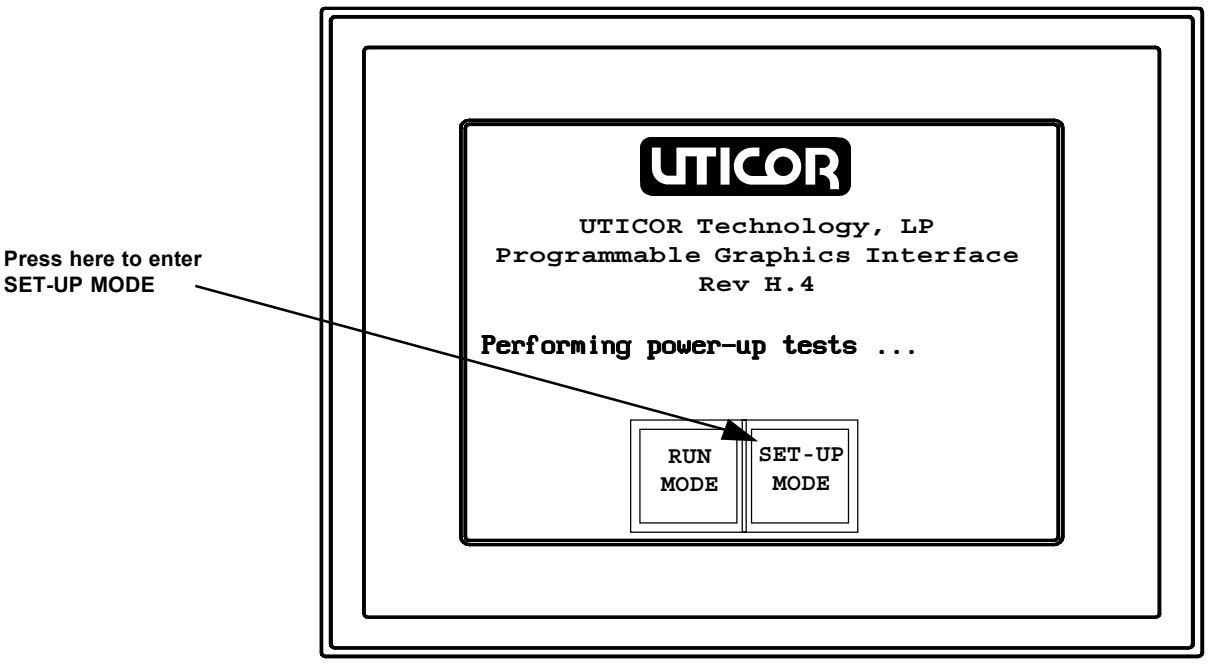
(PSC® Data Logic Scanner Model 5312-2002)



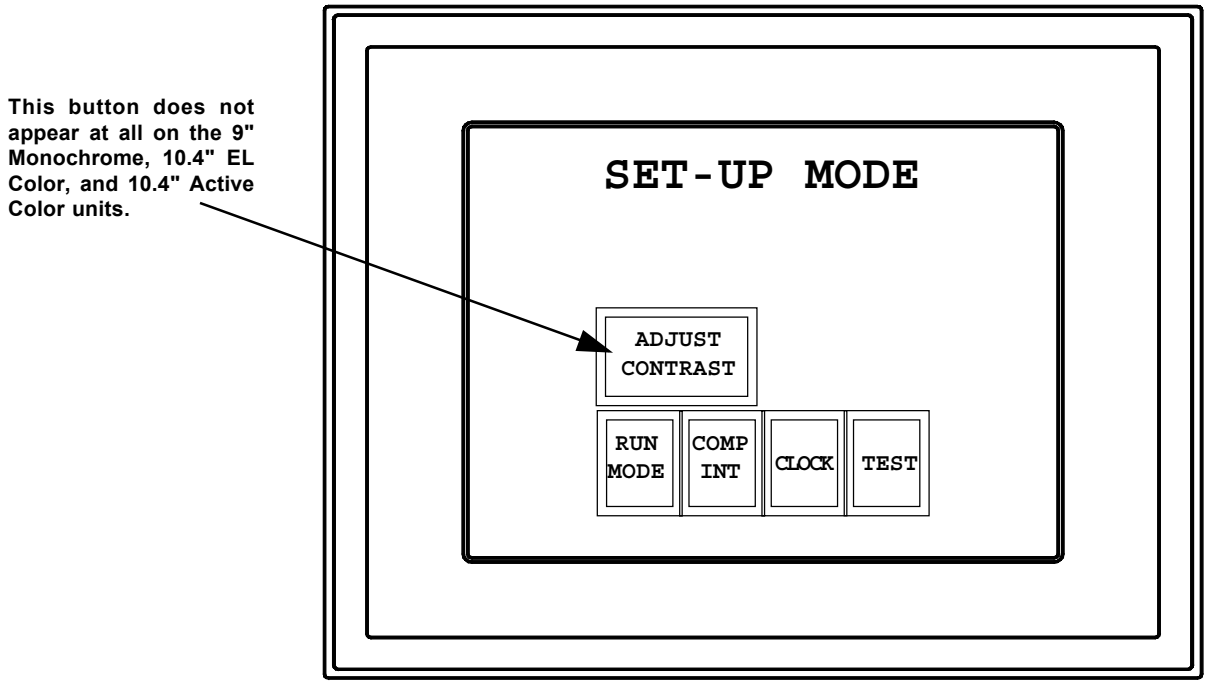
You will need to install uWIN Programming Software to set the PowerPanel Auxiliary Port parameters for the SIP Printer or Bar Code Reader. See Section 6.5 or refer to the uWIN Software User's Manual (P/N 79769) for instructions on how to load the uWIN Software and establish communications between the printer/bar code reader and the PowerPanel. The Auxiliary Port (AUX) CANNOT be used for printing if a Bar Code Reader is connected.

2.3 Communications Setup Mode

After power up, press the pushbutton icon "**SET-UP MODE**" on the screen (as shown below.) This will display the SET-UP MODE screen. You only have a few seconds to press "**SET-UP MODE**" before the unit will automatically enter "**RUN MODE.**"



There are four or five button icons (depending upon your PowerPanel Display type) that reside here: **ADJUST CONTRAST (OR ADJUST BACKLIGHT), RUN MODE, COMP INT, CLOCK,** and **TEST**.



ADJUST CONTRAST/ADJUST BACKLIGHT — (This is not an option on the 9" Monochrome, 10.4" EL and 10.4" Active Color units.) The backlight (brightness) adjustment or contrast adjustment feature (depending upon your unit type) allows you to optimally adjust the backlight for your environment. Ideally, it should be set at the installation site after it has reached operating temperature. Press the **UP** or **DOWN** pushbuttons to adjust the display brightness or contrast.

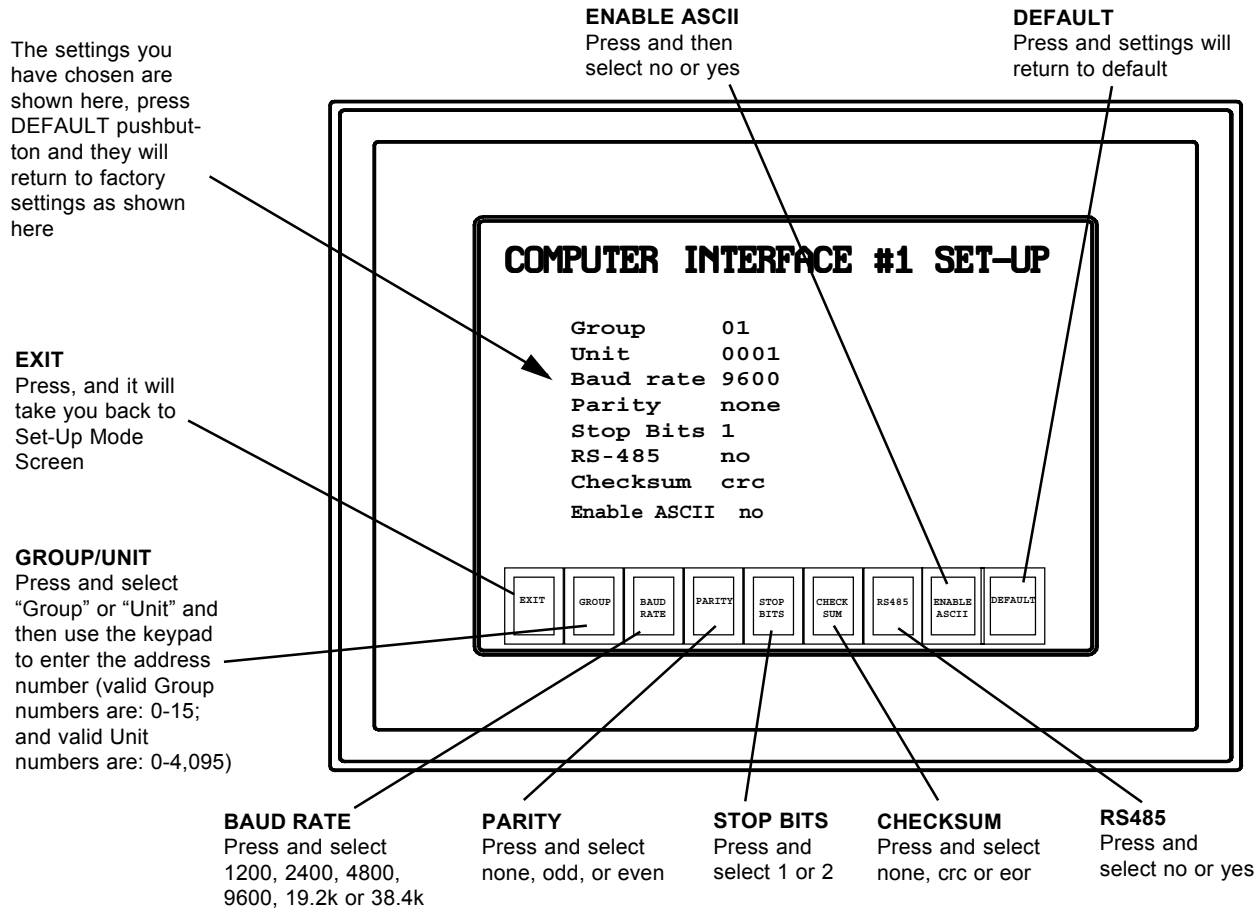
RUN MODE — This allows the PowerPanel to enter its normal operating mode. When the PowerPanel is in the RUN MODE the initial base screen specified in the system attributes will be displayed. In addition, the Unit monitors the interfaces for new input values. The Unit will be in the RUN MODE if communicating. The only way to exit from the RUN MODE is to restart the Unit. Press the **INTRODUCTION, PUSHBUTTON, NUMERIC ENTRY, APPLICATIONS, README, BAR GRAPHS, ALARMS** or **OTHER** pushbuttons for more information about that topic.

☞PLEASE NOTE

Computer interface commands are supported while in the main setup mode screen.

COMP INT — This pushbutton allows you to set the Unit's address and computer port parameters. ***The programming PC running μWIN must have identical communication parameters to communicate properly.*** The following screen will appear.

This is the computer interface set-up screen for the 8" Color unit, your unit type screen may appear different, but it has the same basic set-up functions.



☞PLEASE NOTE

Valid Group and Unit numbers are as follows:
Groups: 0–15
Units: 0– 4,095

- ***Group and Unit Number*** — Each PowerPanel is assigned a Unit Address, and is selected through the Group/Unit pushbutton on the screen. Each Unit Address consists of two identifiers which represent the Group and Unit Numbers. The Unit Addresses are divided into the Group and Unit Numbers to allow the PC to address the specific PowerPanel networked to it.

  Group and unit number possibilities:

  - Group 00, Unit 0000 — addresses all Units in all Groups.
  - Group XX, Unit 0000 — addresses all Units in Group XX.
  - Group XX, Unit XXXX — addresses the specific Unit indicated.

- ***Selection of Remaining Parameters*** — The Baud Rate, Parity, Stop Bits, RS-485A*, Checksum and Enable ASCII are all selected using the touchscreen, basically in the same manner. For example, when the Baud Rate is selected, a screen displaying the available Baud Rates appears. To change the Unit's Baud Rate, simply touch the pushbutton with the Baud Rate you want.

  This simple method is used to set the rest of the Unit's parameters. Simply press the pushbutton icon for the parameter you wish to change.

  Finally, the Unit is equipped with a Default button. Pressing the Default pushbutton adjusts the Unit's parameters to the factory presets.

  * Selecting RS-485 here tells the PowerPanel ***software*** that you have this type of connection to your computer. You still must set the DIP switches as RS-485 (in accordance with the table on page 9) to tell the PowerPanel ***hardware*** the type of connection.

Factory Parameter Presets (Default):

Group	**01**
Unit	**0001**
Baud Rate	**9600**
Parity	**none**
Stop Bits	**1**
RS-485	**no**
Checksum	**CRC**
Enable ASCII	**no**

Y2K

Information

CLOCK — Press the **CLOCK** button to access the screen that allows you to set the unit time and date. Press the **12 HOUR** or **24 HOUR** button to select and then press the **DEC** and **INC** (decrement and increment) buttons next to **Hour, Minute** and **Second** or **Day, Month,** and **Year** to adjust the settings.

PowerPanel is ***Y2K Compliant***, and its programming will not be confused by the year 2000.

TEST — Press the **TEST** button to go the the **TEST MENU** screen. Listed on this screen are the results of four system tests that are automatically performed when **TEST** is pressed — **SYSTEM RAM, VIDEO CHIP, VIDEO RAM,** and **BATTERY**. From this screen you may also run unit diagnostics for **TOUCH PAD, DISPLAY, PLC INT** (PLC interface test), **USER MEMORY,** and **SERIAL PORT** by pressing the applicable button. Follow the on-screen instructions to run the diagnostic for that unit feature.

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3 ASCII Commands for Computer Interface

The PowerPanel is normally used with a PLC. The PowerPanel screens are programmed using uWIN Software.

You may also use the PowerPanel to display messages sent from an ASCII terminal, or a PC running a terminal emulation program (or from a program that sends appropriate codes.) To enable ASCII, you must select "Yes" in SET-UP MODE, COMP. INT. (see previous section 2.3). Listed below are the ASCII codes supported by the PowerPanel.

^Agguuuu
Select unit — gg is group number, uuuu is unit number. A unit must be selected before any ASCII commands will be accepted.

Example: ^A030001 selects group 3, unit 1

^Knnnnn
Display base screen — nnnnn is base screen number 00000–00999. The first two leading n positions must be zero.

Example: ^K00010 displays base screen 10

^Mrrrrvvvvv
New register value — where rrrr is the internal register 0001–1024, and vvvvv is the value 00000–65535.

Example: ^M0050999 writes 999 to OI•Panel register 5

^Pxxx,yyyt^Z
Display text — where xxx is the starting horizontal pixel, yy is the starting vertical pixel, t is a ^Q option and up to 40 characters of text, and ^Z ends the text and displays the text on the screen.

^Qnn
Select text attribute — This command is used only with the ^P command. If an attribute is not specified then the default is used. Where nn is:

01ss select text size where ss is:
00=1x1 (default), 01=1x2, 02=1x4, 03=1x8, 04=2x1, 05=2x2, 06=2x4, 07=2x8, 08=4x1, 09=4x2, 10=4x4, 11=4x8, 12=8x1, 13=8x2, 14=8x4, 15=8x8.

02cc select color (0–15) were cc default is 03

03ff select character set where ff is 00 = ASCII (default and the only character set at this time)

04d select direction where d is:
0=horizontal, 1=vertical

An example of ^P and ^Q commands: ^P010,040^Q0105^Q0202Test^Z — This will display "Test" at 10, 40 using 2x2 character size and color 2. The default attributes ASCII character set and horizontal direction will be used.

^Urrrr
Read register value. Where rrrr is the internal register number 0001–1024. The reply is in the form of ^Uvvvvv^Z where vvvvv is the value 00000–65535.

Example: ^U0100 reads value of register 100

Displaying text on the PowerPanel with QBasic®

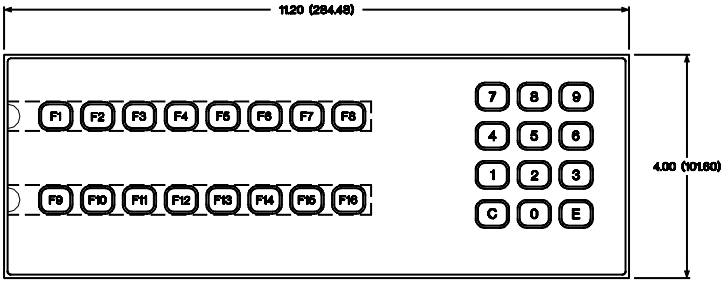
```
OPEN “com1:9600,n,8,1” for RANDOM AS#1 ‘sets computer serial port CLS
PRINT #1, “^A010001”
PRINT #1, “^P010,040^Q0105^Q0202TEST^Z”
```

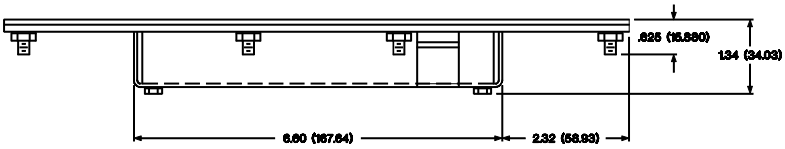
4 Accessories/Replacement Parts/Maintenance

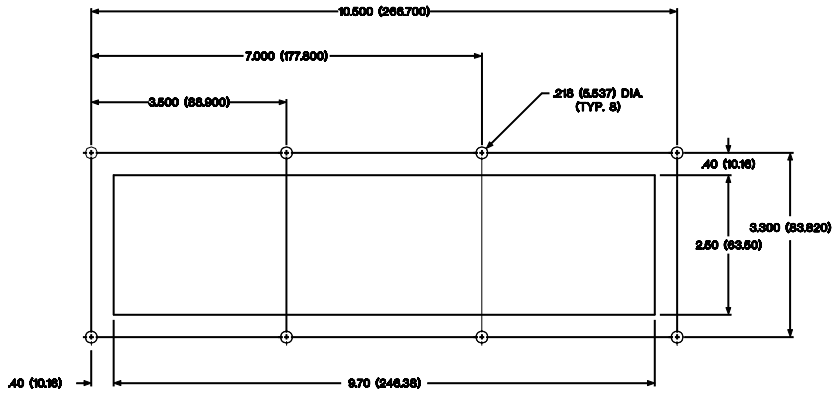
4.1 Accessories

External (Add-On) Keyboard

The 9" Monochrome and 10.4" Color models can be ordered with an optional keyboard that plugs into a modular plug on the bottom of the unit







4.2 Replacement Parts

There are three PowerPanel parts that will need to be replaced as part of routine maintenance: the battery, the fuse and the flourescent backlight. There may be differences between PowerPanel display types, so find the replacement procedures in the following paragraphs that pertain to your display type.

Lithium Battery Replacement Procedures:

CAUTION

You may replace the backup battery without disconnecting the power source, however, if you must disconnect the unit from its power source, YOU WILL LOSE THE USER PROGRAM.

Before disconnecting power, connect the PowerPanel to a computer, install *u*WIN Programming Software, and follow the instructions in the *u*WIN Software User's Manual to Upload your user program to the computer. Save it on disk to Download your saved user program when power is reconnected. It is always a good idea to keep a copy of your user program on disk!

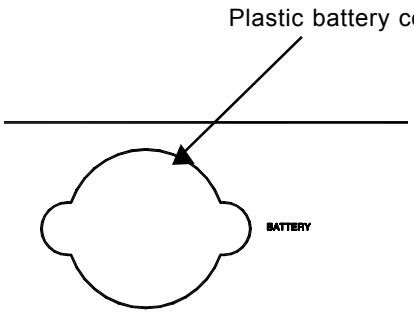
5" Monochrome, 5" STN Color, 5" Active Color, 6" Monochrome, and 8" Color

Battery life is expected to be at least 1 year.

a. Remove plastic battery cover on back of unit (see figure below) to access the coin cell battery.

b. Lift up on edge of battery to release and then slide it out from under the retaining clip. Remove from unit.

c. When installing a new **3.0 V Coin Cell Lithium Battery, P/N 28417 (Generic P/N BR2032)**, ensure that the positive (+) side is facing up.



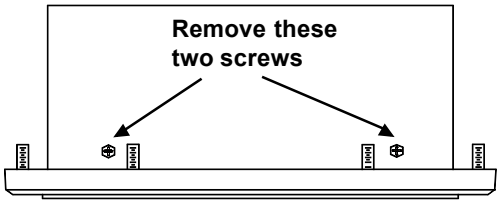
9" Monochrome

Battery Life is expected to be at least 1 year.

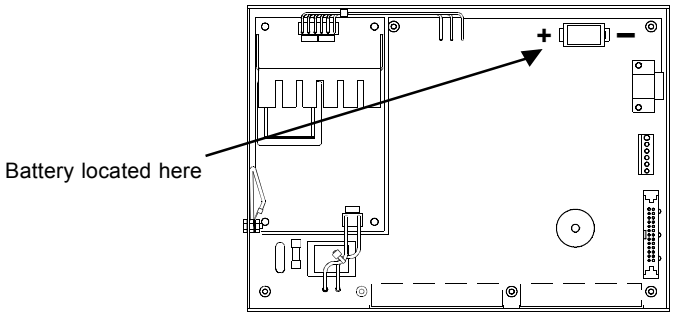
a. Connect PowerPanel to a computer and following instructions in uWIN Software User's Manual, upload the user program from the PowerPanel to the computer. Save the user program to disk.

b. Disconnect power source.

c. Remove four screws (two per side, as shown in figure below) and lift back plate from unit.



d. With the PowerPanel top pointed away from you, the battery location is in the upper-right as shown in figure below. Remove old battery and replace with a **1/2 AA, 3.6 V Lithium Battery, P/N 28421**.



e. Replace back plate and secure with screws.

f. Reconnect power source, connect to PC, run uWINSoftware and follow instructions to download the user program previously saved to disk.

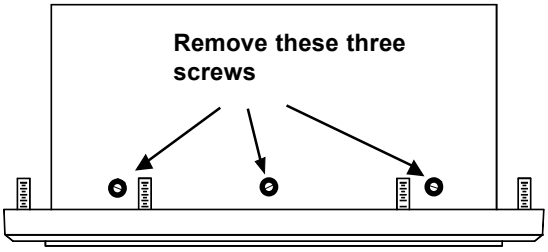
10.4" Color Models

Battery life is expected to be at least 1 year.

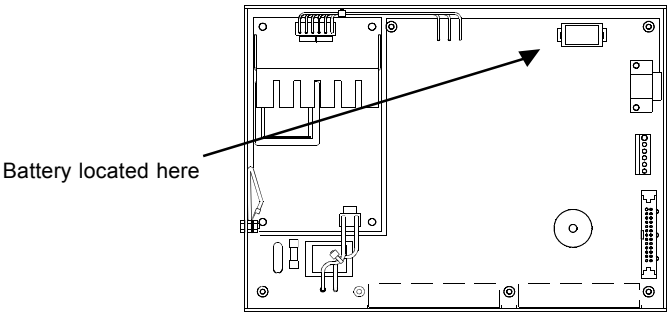
a. Connect PowerPanel to a computer and following instructions in uWINSoftware User's Manual, upload the user program from the PowerPanel to the computer. Save the user program to disk.

b. Disconnect power source.

c. Remove six screws (three per side, as shown in figure below) and lift back plate from unit to access the battery.



d. With the PowerPanel pointed away from you, the battery location is in the upper-right-hand corner as shown in the figure below. Remove old battery and replace with a new **1/2 AA, 3.6 V Lithium Battery, P/N 28421**.



e. Replace back plate and secure with screws.

f. Reconnect power source, connect to PC, run uWIN Software and follow instructions to download the user program previously saved to disk.

Fuse Replacement Procedures:

The fuse may need to be replaced. Reference the paragraphs below for your particular display type.

5" Monochrome without Backlight
Use a **0.5 AMP 250 V 2AG Slo-Blo** fuse.

5" Monochrome with Backlight
Use a **0.75 AMP 250 V 2AG Slo-Blo** fuse.

5" Color Models and 8" Color Model
Use a **1.5 AMP 250 V 2AG Slo-Blo** fuse.

6" Monochrome
Use a **0.75 AMP 250 V Slo-Blo** fuse. (When you have the unit open to replace the fuse, the silkscreen on the board might say 1.5 Amp. Disregard this and use a .75 Amp fuse.)

9" Monochrome
Use a **1 AMP 250 V 2AG Slo-Blo** fuse for the AC powered 9" Mono PowerPanel, or use a **2 AMP 250 V 2AG Slo-Blo** fuse for the DC powered unit.

10.4" Color Models
Use a **1.0 AMP 250 V 2AG Slo-Blo** fuse for the AC powered 10.4" Color PowerPanel Models, or use a **2 AMP 250 V 2AG Slo-Blo** fuse for the DC powered 10.4" Color Models. The 10.4" High-Bright Color PowerPanel uses a **1.5 AMP 250 V 2AG Slo-Blo** fuse for AC power.

Fluorescent Backlight/Bulb Replacement:

A replacement kit is available for the fluorescent backlight bulb used in the PowerPanel. Call technical support (below) to determine your display type and part number of bulb used.

Technical Support

Although most questions can be answered with μWIN HELP or the manuals, if you are still having difficulty with a particular aspect of installation or screen design, technical support is available, call us at **1-800-TEC-ENGR (843-3647)** or FAX us at **1-630-688-4676)**. Visit our website at ***www.AVG.net.***

4.3 Maintenance

To ensure the longevity and effectiveness of the PowerPanel please take note of the following precautions:

- Do not press sharp objects against the screen.
- Do not strike the panel with hard objects.
- Do not press the screen with excessive force.
- If the panel is mounted horizontally, do not place any objects over the touchscreen. This will result in heat buildup and may damage the unit.

The touchscreen has a polycarbonate surface. For a list of general compatibility between chemicals (that may be present in your work environment) and the polycarbonate surface of the touchscreen, contact the factory.

The PowerPanel touchscreen has a scratch resistant coating. This adds a slight chemical barrier to the screen, but the coating's primary purpose is to protect the screen from abrasion. The PowerPanel touchscreen should be cleaned daily with warm, soapy water.

5 Troubleshooting Table

Problem	*Remedy*
Slow response time when changing screens	**1)** Replace toolboxes with triggers and included library screens. **2)** Eliminate 3-D images. **3)** Reduce the quantity of fill points on the screen. **4)** Reduce the number of objects on the screen.
Communication Errors: Time Out Unknown Communication Error	**1)** In uWIN, Options Menu - check Communications Port Setup. **2**) In PowerPanel, Setup Mode, Comp. Int. #1 ensure attributes match port setup in uWIN. **3)** Check DIP Switch settings. **4)** Check cable.
PLC Communication Errors	***Please note that PLC error messages that appear on the screen are unique to the particular PLC -- in uWIN HELP, each PLC lists the errors and explanations that are appropriate for each driver.*** ***To get Help and a list of the Driver Errors, perform the following steps:*** ***a. Install uWIN in accordance with the uWIN manual.*** ***b. Open your user program.*** ***c. Click on Help > Index.*** ***d. Click on Selecting a PLC in the Table of Contents.*** ***e. Click on List of PLC Interface Drivers.*** ***f. Click on (select) the type PLC you are using.*** ***g. Click on Driver Errors.*** ***or*** ***a. Peform steps a. and b. , above, then click on File > Project Setup > PLC > Attributes.*** ***b. Click on HELP button at the bottom of PLC Attributes dialog box.*** ***c. Scroll (if necessary) to "Related Topics" and click on Driver Errors.*** **1)** Check cable wiring between units (see uWIN HELP particular to your PLC for the wiring diagram) **2)** In uWIN, Project Setup > PLC >Attributes, check settings for PLC Communications, verify that they match settings in the PLC. **3)** Check PowerPanel DIP Switch settings. **4)** Check any available switch settings on the PLC. **5)** If connected on a network, isolate PowerPanel to localize the area where the problem exists. **6)** Verify that the PowerPanel registers are mapped correctly: a. does the PowerPanel register exist in the PLC? b. is the register read only? c. is the register write only?

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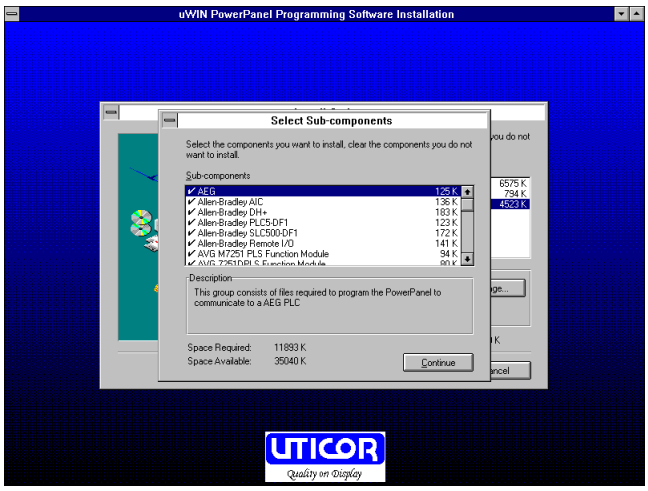
6 *u*WIN Software Programming

Whether you need to modify existing screens or create new screens, you must install the *u*WIN Programming Software included with the unit. We'll briefly describe the installation procedure and provide an example project. Refer to the *u*WIN Software User's Manual, part number 79769, for more information.

*u*WIN enables you to select the PLC driver you need and set the parameters. Also, you use *u*WIN to set any peripheral device parameters (such as a bar code reader or printer), and to set the password protection level.



6.1 Install *u*WIN

a. Connect a PC to your PowerPanel as shown on page 38 of this manual.

b. Load the PowerPanel *u*WIN Software on your PC by placing the first of four 3.5" program Disks into your system's external drive.

c. From the Windows File Menu, select RUN. Type: **A:\install**

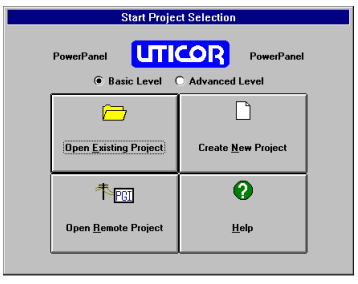
d. Follow the prompts and select only the PLC drivers you need. (Selecting all the PLC drivers will take up about 4 Meg of hard drive space.) Refer to the *u*WIN's Software User's Manual (P/N 79769) for additional information.

6.2 Run *u*WIN

Once the program has been installed, you will have a new Program Group listed in your Windows Program Manager. To run the programming software, use the mouse to double CLICK on the *u*WIN Software icon. Once the software has been launched, you will see the Start Project Selection screen. Here you choose the Programming Level you wish to work at:

- **Basic**
- **Advanced**

To have access to all the programming screens and functions, select Advanced.



From the Start Project Selection screen, CLICK on "Open Existing Project" to work offline, or CLICK on "Open Remote Project" to work online.

6.3 Online or Offline?

You may upload and then modify the an existing PowerPanel Program on your PC by working offline (not connected to a PowerPanel.) You may also work online with the PowerPanel unit to make changes to an existing Program.

Working offline you may use *u*WIN to redesign your PowerPanel screens in your office or home—or even while on travel. Your project becomes as portable as your laptop, and your PowerPanel is not "down" while you are redesigning or making modifications as your unique application needs grow or change.

Working online allows you to make quick fixes or design changes to an installed PowerPanel and its existing programming. You can eliminate a step or two and save time by downloading these changes directly to your PowerPanel. Now you can see the effect of the screen design changes you have made immediately, eliminating the traditional "edit-compile-download" cycle. Most of you will employ both methods at one time or another, but whether working offline or online—you will certainly appreciate the versatility provided by the PowerPanel and its easy-to-use *u*WIN Software.

If working offline, your project may be uploaded to the PowerPanel at any time. The upload function allows you to select a project to be loaded to the PowerPanel. From *u*WIN's Main Menu Bar, select File>Remote Transfer> Upload File to Unit. When "Upload File to Unit" is selected, a dialog box similar to the Open File dialog is shown. The file to upload is selected from that dialog box.

If working online you may download a project file to your PC. The download function ("Download File from Unit") allows you to load a project from the PowerPanel to your PC. From *u*WIN's Main Menu Bar, select File>Remote Transfer>Download File from Unit. Select the file to be downloaded and simply click OK. The internal register map, file protection and passwords, PLC attributes, system attributes, the initial values of the internal registers and image screens are saved to disk.

The "how to's" are explained in greater detail in the *u*WIN Software Manual. Consult the manual or *u*WIN Help for more information.

6.4 Example:

Below is a simple tutorial showing you how to program a **PUSHBUTTON** to toggle a bit **OFF** and **ON**. In a real world application this feature can be used to **START/ STOP** a motor or pump, or **OPEN/CLOSE** a valve. Refer to the figure on the next page.

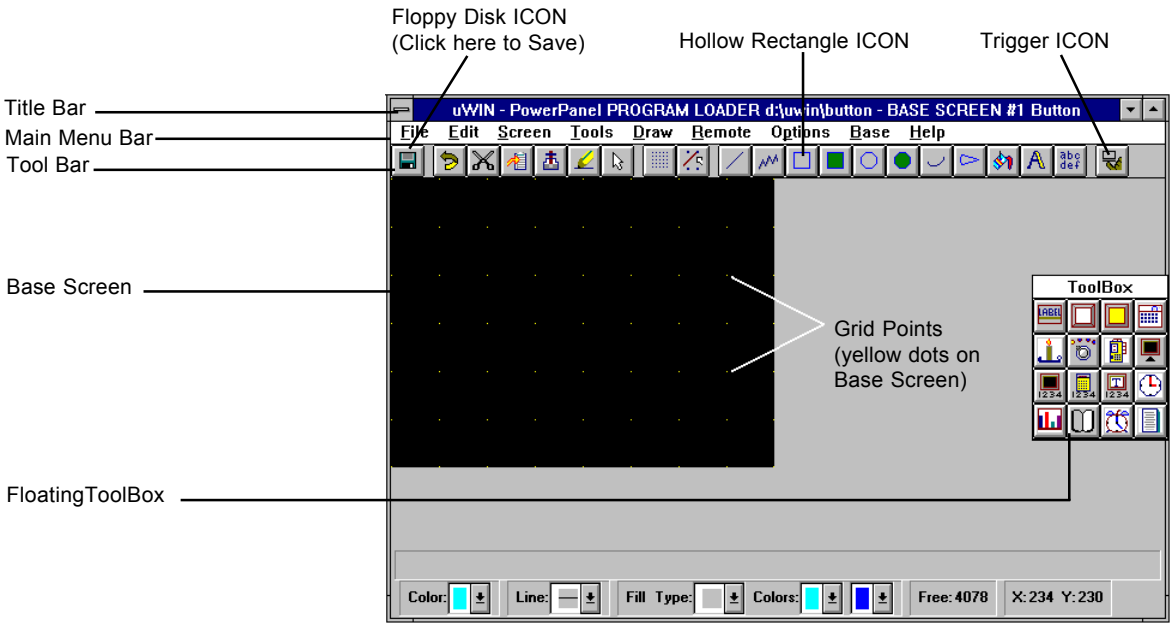
With *u*WIN running on your PC, **begin with step a, below:**

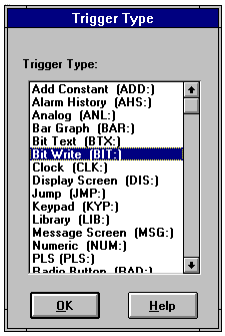
a. From the Main Menu Bar, CLICK on Screen > Select > Base to go to the **SELECT BASE SCREEN** dialog box.

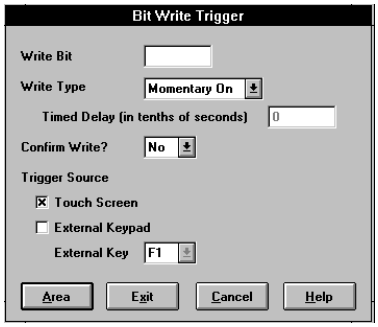
b. Type "1" for Screen **Number** and "Button" for Screen **Title**. CLICK on Select to choose it. A new **BASE** Screen with this number and title will appear.

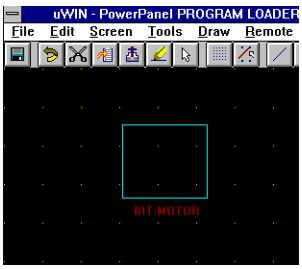
c. From the Main Menu Bar, CLICK on Draw > Rectangle > Hollow, or CLICK on the Hollow Rectangle Icon from the Toolbar.

   Position the crosshair cursor on a **Grid Point** close to the middle of the screen programming field. A Grid Point is a mark to show you a **Touch Cell** area when the **Grid Size** is set to 40 x 40.









Now CLICK (but DO NOT HOLD) the left mouse button and drag the mouse down and right to the next **Grid Point**.

d. Now we need to create a **Trigger** that will turn **ON** a **Register Bit**. The **Trigger** will be placed OVER the **Pushbutton** that you just created using the Draw > Rectangle > Hollow command. To do this, CLICK on Draw > Trigger on the Main Menu Bar or CLICK on the **Trigger Icon** on the far right of the ToolBar.

e. The **Trigger Name** dialog box will appear. Type in the Trigger Name "MOTOR", and CLICK on the **Edit Button**. A list of **Trigger Types** will appear, select **Bit Write Trigger (BIT:)** from the list.

f. The **Bit Write Trigger** dialog box will appear. The PowerPanel needs to know which one of its 1,024 **Internal Registers** and which one of its 16 **Bits** you want to use.

For this example, use PowerPanel register number 1 and bit 0 (bits are numbered 0–15). In the box to the right of **Write Bit,** type "1/0". (The "/" is the Register/Bit separator.)

CLICK on the down arrow next to the **Write Type** field (box). Select the**Toggle** option from the drop down list. Leave all other selections at **Default** and CLICK on the **Area Button**.

g. You will notice that your cursor becomes a crosshair and the name of the **Trigger** appears next to it as "**BIT:MOTOR**." You must place the **Trigger Name** somewhere on the screen (typically near the area where you plan to place the trigger). CLICK the left mouse button to position the Trigger Name. ***The Trigger Name is displayed only on the computer monitor, not on the PowerPanel screen, and is solely for the programmer's (your) benefit.***

h. The **Trigger Area** now needs to be defined. Place the crosshair cursor at one of the corners of the pre-drawn Pushbutton and CLICK, but DO NOT HOLD, the left mouse button. Drag the mouse to the opposite corner of the Pushbutton and CLICK. Your Trigger is now set.

i. CLICK on the floppy disk icon on the **ToolBar** to Save the screen.

6.5 Auxiliary Port Setup

This port (not available in the 5" Monochrome Models) can be used for connecting peripheral devices to the PowerPanel. In this section we have outlined two common peripherals: a small desktop printer and a bar code reader. You may only use the Auxiliary Port for one or the other. You cannot have a printer and a bar code reader connected at the same time.

UTICOR SIP Printer

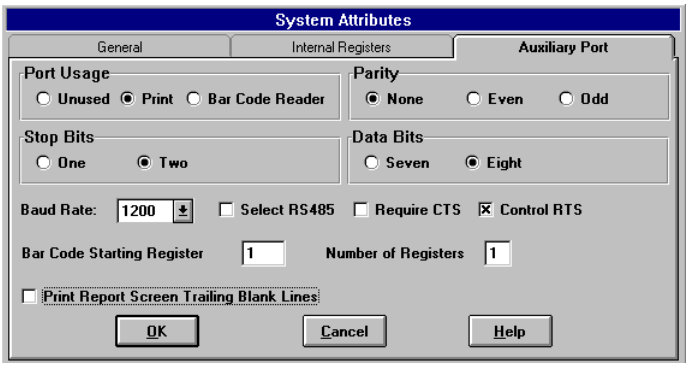
UTICOR offers a 40-line desktop line printer that can be connected to your Power-Panel. When using the UTICOR SIP 100 printer the following parameters must be met:

a. You must be connected to a printer (see page 38) and online to program these parameters.

b. From the Main Menu Bar, CLICK on File > Project Setup > System Attributes.

c. CLICK on the **Auxiliary Port** tab.

d. Make the selections shown in the figure below. This will enable you to print alarm screens and report screens.



Bar Code Reader

The first step in connecting the bar code reader is to wire it to the PowerPanel auxiliary port.

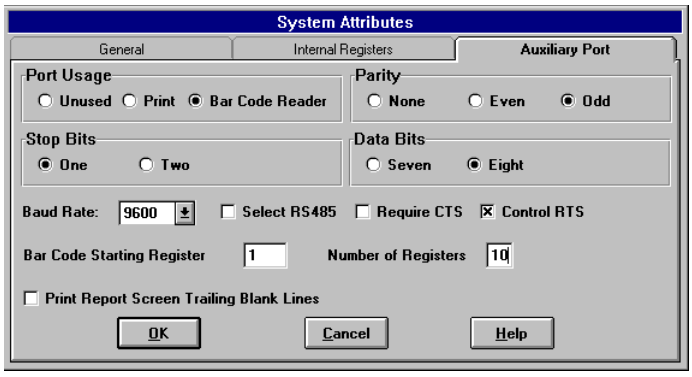
Follow the wiring schematics provided on page 38 to connect the PowerPanel to the scanner. We used a PSC® Data Logic Bar Code Reader (model 5312-2002).

In order to set the PowerPanel's system attributes to match the scanner (bar code reader):

a. Open or create a file using the PowerPanel's *u*WIN Software. Name it **"Scanner Test."**

b. From the Main Menu Bar, CLICK on File > Project Setup > System Attributes.

c. CLICK onto the **Auxiliary Port** tab.



d. From the three options listed under **Port Usage**, CLICK onto **Bar Code Reader**.

e. Select **9600** for the **Baud Rate;**

f. Select **Odd** for **Parity**.

g. CLICK onto the option to select **Eight** for **Data Bits**.

h. Select **One** for **Stop Bits**.

i. Select **NO** (leave unchecked) for the options **RS-485**, **Control RTS**, and **Control CTS**.

j. Next to **Bar Code Starting Register**, enter a number that will be the starting register for the bar code. For this example, we chose to start at register one.

k. Select the **Number of Registers** to use for the bar code data. For this example, we selected **10** registers to use.

Now we will be placing information in 10 registers, starting at the location of register one. Once all the parameters are set in the PowerPanel, save the settings by CLICKING OK.

With the Bar Code Scanner:

a. Connect the scanner to its power source.

b. Find the location in the Scanner Manual for selecting the **Baud Rate** and scan the bar code for **9600 Baud Rate**.

c. Find the location in the Scanner Manual for selecting the **Parity** and Scan the bar code indicating **Odd Parity**.

Important NOTE:

The scanner uses bar codes in the manufacturer's user manual to set its parameters. To enter the scanner's parameters turn to the appropriate page in the manual and scan the data.

Entering Bar Code Parameters

a. Locate the section of the manual for determining **Data Bts** and scan the bar code for **Eight Data Bits**.

b. Locate the section of the manual for determining **Control RTS** and scan the bar code indicating **NO RTS**.

c. Locate the section of the manual for determining **CTS** and scan the bar code indicating **NO CTS**.

d. Locate the bar code for indicating **no protocol** and scan it.

e. Scan the bar code setting the **Prefix** equal to **STX.**

f. Scan the bar code setting the **Suffix** equal to **ETX.**

In addition, PowerPanel protocol requires you to set the **Preamble** and **Postamble** to **None**. Find the section enabling you to set these.

g. Scan the bar code setting **Preamble** to **None**.

h. Scan the bar code setting **Postamble** to **None**.

Once the scanner's attributes are set to match the PowerPanel, you must determine the type (symbology) of data you will be scanning. Some examples of symbology include:

Code 39
UPC (A and E)
EAN/JAN
Code 2 of 5
Interleaved
Standard
MSI/Plessey
Code 11

Consult your scanner's manual for further information regarding symbology and data type.

Viewing the Scanned Data

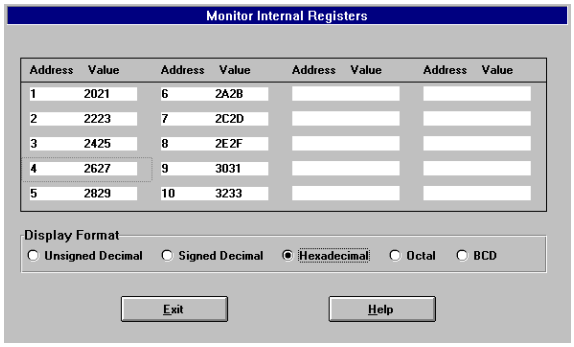
To view data that the scanner is sending to the PowerPanel, you can monitor the registers online.

a. CLICK on File >Open Remote to access your PowerPanel.

b. Once the unit is online with your PC, CLICK Remote > Monitor Registers.

c. The **Monitor Internal Registers** Screen will appear. CLICK first data field and enter the register **Address**. Press the Enter key. CLICK second data field, enter data, press Enter key and continue until finished.

d. Once all of the registers have been entered, select the **Display Format** (data type) from the options listed. The data will be displayed in the format you choose.



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7 How to Order

Model Part Number	Description

PowerPanels:

100G - 5A 1R — **5" Active Matrix Color, NEMA4X**
24VDC Input, 256K RAM

100G - 5S 1R x
1 — **5" Color LCD, 16 Colors, NEMA4**
24 VDC Input, 256K RAM

100G - 5L 1R x
1 — ..... **6" Monochrome LCD, 3 Levels of Grey, NEMA4**
24VDC Input, 256K RAM

100G - 8S 1R x
1 — **8" Color LCD, 16 Colors, NEMA4**
24VDC Input, 256K RAM

1: PLC Interface Type: Substitute for x from the following option list:*

0 ..... Basic Unit, software driver for PLC interface
1 ..... Allen-Bradley (Remote I/O, Data Highway +)
4 ..... Modbus Plus
8 ..... Profibus Interface

100 x - x M xx x
1 2 3 4 — **9" EL Monochrome (Amber), NEMA4**

1: Bezel: Substitute for x from the following option list:

G ..... Standard Bezel
S ..... Stainless Steel Bezel

2: Input Voltage: Substitute for x from the following option list:

1 ..... 115/230 V AC/DC
2 ..... 24 VDC Input

3: Memory: Substitute for xx from the following option list:

1R ..... 256K RAM
2R ..... 512K RAM
1F ..... 256K FLASH
2F ..... 512K FLASH

4: PLC Interface Type: Substitute for x from the following option list:*

0 ..... Basic Unit, software driver for PLC interface
1 ..... Allen-Bradley (Remote I/O, Data Highway +)
4 ..... Modbus Plus
6 ..... GE Genius I/O
7 ..... Magnetek
8 ..... Profibus Interface

100 x - x S xx x
1 2 3 4 — **10.4" Color LCD Model, 16 Color, NEMA4X**

1: Bezel: Substitute for x from the following option list:

G ..... Standard Bezel
S ..... Stainless Steel Bezel

2: Input Voltage: Substitute for x from the following option list:

1 ..... 115/230 V AC/DC
2 ..... 24 VDC Input

* If you don't see your PLC type listed here, call our Applications HOTLINE at 1-800-TEC-ENGR (832-3647)

Model Part Number	Description

3: Memory: Substitute for xx from the following option list:

1R ..... 256K RAM
2R ..... 512K RAM
1F ..... 256K FLASH
2F ..... 512K FLASH

4: PLC Interface Type: Substitute for x from the following option list:*

0 ..... Basic Unit, software driver for PLC interface
1 ..... Allen-Bradley (Remote I/O, Data Highway +)
4 ..... Modbus Plus
6 ..... GE Genius I/O
7 ..... Magnetek
8 ..... Profibus Interface

100 x - x C xx x
1 2 3 4

10.4" Active Matrix Color LCD Model, 16 Colors, NEMA 4X

1: Bezel: Substitute for x from the following option list:

G ..... Standard Bezel
S ..... Stainless Steel Bezel

2: Input Voltage: Substitute for x from the following option list:

1 ..... 115/230 V AC/DC
2 ..... 24 VDC Input

3: Memory: Substitute for xx from the following option list:

1R ..... 256K RAM
2R ..... 512K RAM
1F ..... 256K FLASH
2F ..... 512K FLASH

4: PLC Interface Type: Substitute for x from the following option list:*

0 ..... Basic Unit, software driver for PLC interface
1 ..... Allen-Bradley (Remote I/O, Data Highway +)
4 ..... Modbus Plus
6 ..... GE Genius I/O
7 ..... Magnetek
8 ..... Profibus Interface

100 x - x E xx x
1 2 3 4

10.4" EL Color Model, 8 Colors, NEMA 4X

1: Bezel: Substitute for x from the following option list:

G ..... Standard Bezel
S ..... Stainless Steel Bezel

2: Input Voltage: Substitute for x from the following option list:

1 ..... 115/230 V AC/DC
2 ..... 24 VDC Input

3: Memory: Substitute for xx from the following option list:

1R ..... 256K RAM
2R ..... 512K RAM
1F ..... 256K FLASH
2F ..... 512K FLASH

* If you don't see your PLC type listed here, call our Applications HOTLINE at 1-800-TEC-ENGR (832-3647)

Model Part Number	Description
	4: PLC Interface Type: Substitute for x from the following option list:* 0 ..... Basic Unit, software driver for PLC interface 1 ..... Allen-Bradley (Remote I/O, Data Highway +) 4 ..... Modbus Plus 6 ..... GE Genius I/O 7 ..... Magnetek 8 ..... Profibus Interface
100 x - 1 H xx x **1** **2** **3**	**10.4" High-Bright Color Model, 16 Colors, NEMA4X, 115/230 V AC/DC** **1**: Bezel: Substitute for x from the following option list: G ..... Standard Bezel S ..... Stainless Steel Bezel **2**: Memory: Substitute for xx from the following option list: 1R ..... 256K RAM 2R ..... 512K RAM 1F ..... 256K FLASH 2F ..... 512K FLASH **3**: PLC Interface Type: Substitute for x from the following option list:* 0 ..... Basic Unit, software driver for PLC interface 1 ..... Allen-Bradley (Remote I/O, Data Highway +) 4 ..... Modbus Plus 6 ..... GE Genius I/O 7 ..... Magnetek 8 ..... Profibus Interface

ACCESSORIES

Computer Interface Cable:

43962	3 meters long, Computer Interface Cable, RS-232C (9 Pin D connectors on both ends)

* If you don't see your PLC type listed here, call our Applications HOTLINE at 1-800-TEC-ENGR (832-3647)

PLC Cable Part Numbers		Item Description	
5" Mono	All Others*	Mfr	Model
PLC Interface Cable:		*(each cable is 3 meters long and appropriately terminated)*	
44359	43933	**Allen-Bradley**	SLC500 Programming Port (DH-485)
44364	43983		SLC500 AIC Link Coupler Module (RS-485A)
44360	43976		SLC500 DF1 (RS-422A)
44361	44314		SLC500 DF1 (RS-232C)
44362	43978		SLC500 DF1 (RS-485A)
44363	44313		PLC5 DF1 (RS-485A)
44393	44394	**CTC**	CTC2200/2600 (RS-232C)
44365	43939	**General Electric**	Series 90-30, 90-70 SNP, SNP-X
44377	44315	**IDEC**	FA2/FA2J/FA3S/FA25M (RS-232C)
44386	44385	**Keyence**	(RS-232C) *Models:* KV-10R, 10T, 16R, 16T, 24R, 24T, 40R, 40T, 80R, 80T, or 300
44373	43947	**Klockner-Moeller**	PS 306/316 (RS-485A)
44374	44307		PS4 (RS-232C)
44382	44381	**Koyo**	(RS-422A) *Models:* DL305 Series (DL340/350), or DL405 Series (DL430/440/450)
44384	44383		(RS-232C) *Models:* DL305 Series (DL330/330P/340/350), or DL405 Series (DL430/440/450) and D3-232-DCU Module
43151	43150		(RS-232C) *Models:* DL205 Series (DL240/250), or DL305 Series (DL340/350), or DL 405 Series (DL450)
44391	44389	**Mitsubishi**	MELSEC FX Series (RS-232C)
44392	44390		MELSEC FX Series (RS-422A)
44378	44318	**Modicon**	AEG Series A120 (RS-232C)
44398	44399		AEG Modicon Micro
44366	44312		Modbus (RS-232C)
44367	44311	**Omron**	Host Link (RS-232C)
44375	44309	**Reliance**	Automate (RS-232C)
44369	43970	**Siemens/TI**	545 (RS-422A)
44370	44310		545 (RS-232C)
44388	44387		S7 HMI Adaptor (RS-232C)
44368	43934	**Square D**	SY/MAX (RS-422A)
44379	44316	**Toshiba**	Prosec T Series (RS-422A)
443171	44317		Prosec T Series (RS-232C)
44371	44226	**UTICOR**	Director 6001 PLC (RS-422A/485A)
44372	44227		Director 6001 PLC (RS-232C)

**This column includes PowerPanel models: 5" Color (all color models), 6" Monochrome, 8" Color, 9" Monochrome EL, and 10.4" Color (all color models)*

Part Number	Item
Fuses:	
28105	Fuse sub mini 1.5 A, 250 V Slo-Blo (24 VDC operation) for: ..... 5" Color, 8" Color, and 10.4" High-Bright Color Models
28106	Fuse sub mini 1.0 A, 250 V Slo-Blo **(115/230 V AC/DC operation)** for: ..... **9" Monochrome and 10.4" EL, Active, and PassiveColor Models**
28107	Fuse sub mini 0.5 A, 250 V Slo-Blo (24 VDC operation) for: ..... 5" Monochrome with No Backlight Model
28109	Fuse sub mini 0.75 A, 250 V Slo-Blo (24 VDC operation) for: ..... 5" Monochrome with Backlight and 6" Monochrome Models
28113	Fuse sub mini 2 A, 250 V **(24 VDC operation)** for: ..... **9" Monochrome, and 10.4" EL, Active, and PassiveColor Models**
Batteries:	
28417	Battery, Lithium, Coin Cell, 3.0 Volt for: ..... 5” Color, 6" Monochrome and 8" Color Models
28421	Battery, Lithium, 1/2 AA, 3.6 Volt for: ..... 9" Monochrome and 10.4" Color Models
Miscellaneous:	
72459	24 Volt DC Power Supply* (for 5", 6" & 8" Models only) **You may use any 24 VDC, 1 A Regulated Power Supply)*
343117	25-Pin D Connector (Male), mating connector for 5" Monochrome Model
76845	External Keypad Module, 16 function keys and numeric keypad
58457	Protective Screen Overlay, monochrome models
58461	Protective Screen Overlay, color models
10F64	μWIN Programming Software (WIndows version)
79769	μWIN Programming Software User’s Manual
*	Fluorescent Bulb/Backlight Replacements * Call AVG Technical Support at 1-800-TEC-ENGR (832-3647)

Notes:

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