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Hardware Installation Guide

PanelMate Power Series 1500



Cutler-Hammer

EATON

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Preface

Welcome to the Cutler-Hammer PanelMate Power Series 1500 Hardware Installation Guide. This chapter describes the contents of this manual and provides information on Cutler-Hammer Support Services.

About This Manual

Purpose

This manual describes hardware installation of the PanelMate Power Series 1500 Operator Station.

What's Inside

This manual is organized as follows:

Preface

Chapter 1 : Introduction

Chapter 2: Hardware Checkout Overview

Chapter 3: Installation In An Industrial Enclosure

Chapter 4: Regular Maintenance

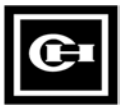
Chapter 5: PanelMate Unit Troubleshooting Guide

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Appendix B: Installation Guidelines

Appendix C: Accessories And Options

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Technical Support **1-800-809-2772**

If you are in the U.S. or Canada, you can take advantage of our toll-free line for technical assistance with hardware and software product selection, system design and installation, and system debugging and diagnostics. Technical support engineers are available for calls during regular business hours (8 am - 5:30 pm EST) by calling 1-800-809-2772. International calls can be made to either the Tech Line at 1-800-809-2772 (toll call) or the Cutler-Hammer main business line at 614-882-3282.

Emergency Technical Support **1-800-809-2772**

Because machines do not run on a nine-to-five schedule, we offer emergency after-hours technical support. A technical support engineer can be paged for emergencies involving plant down situations or safety issues. Emergency support calls are automatically routed directly to our answering service after-hours (5:30 pm - 8 am EST) and weekends. For emergency technical support, call 1-800-809-2772.

- Does not currently include product repairs or shipping outside normal business hours.

Technical Support Fax **614-882-0417**

You can also contact our technical support engineers by faxing your support requests directly to APSC Westerville at 614-882-0417.

Information Fax-Back Service **614-899-5323**

The latest Cutler-Hammer product information, specifications, technical notes and company news is available to you via fax through our direct document request service at 614-899-5323. Using a touch-tone phone, you can select any of the info faxes from our automated product literature and technical document library, punch in a fax number and receive the information immediately.

Bulletin Board Service **614-899-5209**

Parameters: 8 data bits, 1 stop bit, parity none, 9600-28.8K baud.

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Website and E-mail Address **http://www.cutler-hammer.com**
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If you have Internet capabilities, you also have access to technical information via our website at http://www.cutler-hammer.com. The website includes technical notes, frequently asked questions, release notes, and other technical documentation. This direct technical support connection also offers you the ability to request assistance and exchange software files electronically. Technical support messages and files can be sent to CSC@idt.ch.etn.com.

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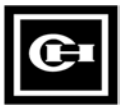
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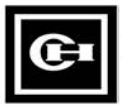
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1. Stock availability, proof of shipment, or to place an order.
2. Expedite an existing order.
3. Product assistance and product price information.
4. Product returns other than warranty returns.

For information on your local distributor or sales office, call the Cutler-Hammer Tech Line at 1-800-809-2772.

Correspondence Address

Cutler-Hammer
173 Heatherdown Drive
Westerville, OH 43081



Introduction

1

This chapter introduces you to the PanelMate Power Series 1500 Hardware Manual.

How to use this Manual

Welcome to the Cutler-Hammer PanelMate Power Series 1500 Hardware Installation Guide. The manual describes assembly, screen configuration, installation, operation, and maintenance.

In this manual, the terms "PanelMate Power Series Unit" or "Operator Station" refers to a PanelMate Power Series 1500 Video Control Panel.

Refer to Appendix C for information on PanelMate Unit options.

This manual is written for system engineers, plant engineers, plant maintenance personnel and Cutler-Hammer personnel; any persons who may be involved in configuring screens, or installing and maintaining an Operator Station. This manual is not written for plant personnel who will be using the Operator Station to control factory operations. The task of informing plant operators how to use the Operator Station in specific situations is left to those who configured the screens.

Hardware Checkout Overview

2

In this chapter, you will learn:

- *How to set-up the PanelMate Power Series 1500 unit for checkout*
- *How to check system health*
- *How to set the real-time clock*
- *Other Offline Operations*

Unpacking

Carefully remove all equipment from the packing cartons and inspect all parts for damage in shipment. Check packing cartons for all items shown on the packing list. Keep the cartons and packing materials for future shipment.

Report any damage to the carrier who delivered the equipment, then contact the organization from which you purchased the equipment. This may be your local distributor or Cutler-Hammer. If you purchased the equipment from Cutler-Hammer, call the Order Processing Department at (614)-882-3282.

The Interstate Commerce Commission has a time limit on reporting concealed damage.

Packing Lists

With the exception of the mounting screws, the packing lists for the Touchscreen version of the PanelMate Power Series 1500 and the Keypad version are identical.

PanelMate Power Series 1500 Touchscreen Version

- 1 Hardware Users Guide
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of 10 ea. #6 mounting nuts and washers
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate Power Series 1500 Keypad Version

Same as Touchscreen version except ...

- 1 Packet of 12 ea. #8 mounting nuts and washers

Optional PLC Cable

If you ordered a **PLC cable** as an accessory, it will be packaged separately:

Optional Serial Transfer Cable

If you ordered a **Serial Transfer cable** as an accessory, it will be packaged separately.

Check System Health

You may wish to test your unit before you install it in your industrial enclosure. This section outlines the steps required to set-up the PanelMate unit on a work surface for check-out before installation. You will be performing this procedure:

1. Connect to DC Power.
2. Power Up the Unit.
3. Execute the System Diagnostics from the Offline Mode menu.

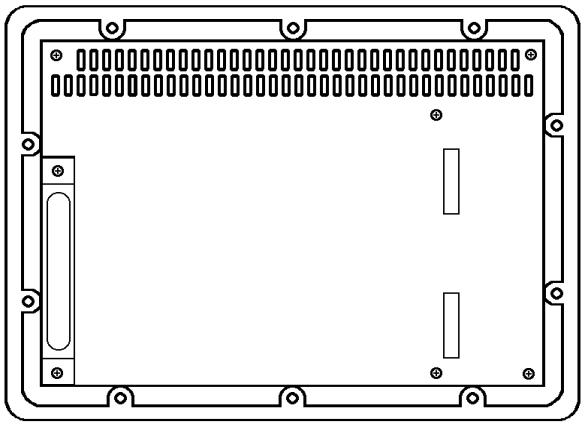


Figure 2-1 PanelMate 1500 Rear View

Connect DC Power

The DC power connector receptacle is located on the bottom of the PanelMate unit. The unit operates at 24 VDC. -15% / +20% @ 12W. The removable connector (Fig. 2-2) is shipped in a plastic bag. Connect your DC power with user-supplied wiring. Typical examples for connection to a DC power supply are shown in Figures 2-3 and 2-4.

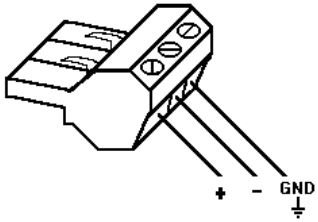


Figure 2- 2 Three-Position DC Power Connector

Caution

A PanelMate unit could be damaged if it is connected to voltages outside the range of 18 to 30 VD.C. The unit is fully protected against polarity reversal - it will not operate if input polarity is reversed.

Note *Power Conditioning may be required when the PanelMate unit is installed in a high noise environment.*

Connection If Power Supply Common (-) Terminal is Grounded

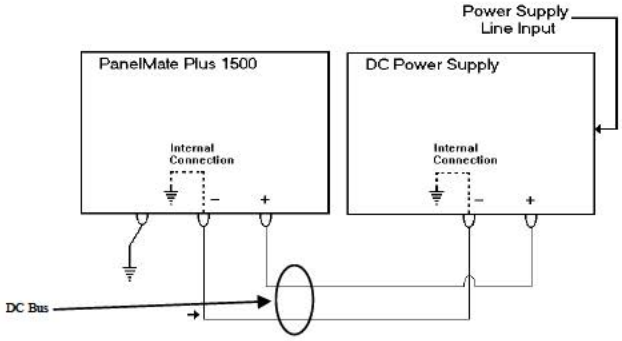


Figure 2-3 Connection With Grounded Power Supply

Connection If Power Supply Common (-) Terminal is Floating

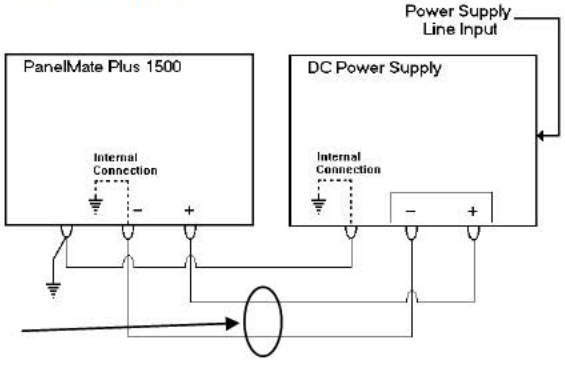


Figure 2-4 Connection With Floating Power Supply

Power Up the Unit

1. Turn the power on by plugging in the DC power connector. If you are restarting from a power interruption, the power may already be on.

   Note *The following steps apply when you are initially powering up the PanelMate unit, or restarting from a power interruption.*

2. The PanelMate unit performs internal diagnostic checks, and displays a listing of the checks as they are executed. In case of failure, see Chapter 5, PanelMate Unit Troubleshooting Guide.

3. Then, the PanelMate unit returns to the state it was in when it was powered off.

   - If the PanelMate Unit was in the Offline Mode, it will return to the Offline Mode and display the menu shown in Figure 2-5.
   - If the PanelMate unit was in the Run Mode, it will return to that mode. The unit will go to the Startup page as defined by the configuration that is loaded in the unit. It will be necessary to put the PanelMate unit into the Offline Mode to perform the diagnostic tests.

To go to the Offline Mode from the Run Mode:

1. Select Get Page from the default control buttons.
2. Select More.
3. Select Setup Page.
4. Select Enter Offline Mode.
5. Press Execute. The screen in Figure 2-5 is displayed.

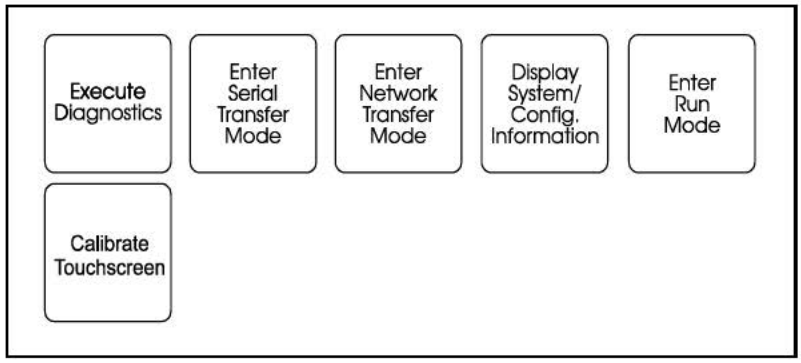


Figure 2-5 Offline Mode Menu

Offline Mode Menu

Figure 2-5 shows the Offline Mode menu. Each of the sections is described below.

Execute Diagnostics

Select the template labeled Execute Diagnostics then press the control button labeled Execute. A new page of choices appears.

By selecting the appropriate template then pressing the Execute control button you can perform these tests:

- Set Date and Time
- Display Tests
- Touchscreen Test
- Keypad Test
- Tone and Battery Test
- System Status

Setting Date and Time

1. Select Set Date and Time and press the control button labeled Execute. A new page will be displayed.
2. Select Set Date and press the control button labeled Execute. The right hand control buttons will change and numeric entry will be enabled. Use the numeric keypads to enter the month, day of the month and the year using the format MM-DD-YY. Be sure to use the minus key between the numeric values. By pressing the control button labeled Enter, the new date will be entered. If the date is already correct, press the <Cancel> key to exit.
3. Select Set Time and press the control button labeled Execute. Use the numeric keys to enter the time as HH-MM-SS with the hours in the 24-hour format. For example, 2:45:11 PM should be entered as 14-45-11. Again be sure to use the minus key between numeric values. Pressing the control button labeled Enter will enter the new time. If the time is already correct, press the <Cancel> key to exit.
4. Press the <Cancel> key and then the bottom control button labeled Exit to proceed.

Perform Display Tests

Select Display Test and press the control button labeled Execute. The new page will display the tests that can be run.

If you have a PanelMate grayscale unit, the tests will be:

- Intensity Check
- Solid No Intensity Screen
- Solid High Intensity Screen
- Dot Pattern.

If you have a PanelMate color unit, the tests will be:

- Color Check
- Solid Black Screen
- Solid White Screen
- Dot Pattern.

Select a test and press the control button labeled Execute. To leave a test, press <Cancel>.

Perform Touchscreen Test

Use this test to verify touchscreen operation. Select Touchscreen Test and press the control button labeled Execute. As the touchscreen is pressed, it is identified on the page display. Test the <Cancel> key last as it exits the test mode.

Perform Keypad Test

Use this test to verify keypad operation. Select Keypad Test and press the control button labeled Execute. As a key is pressed, it is identified on the page display. Test the <Cancel> key last as it exits the test mode.

Test Audio Tone And Battery

Selecting this template cell and pressing the control button labeled Execute displays several new selections for testing the Tone and Real-Time Clock Battery.

System Status

Select System Status and press the control button labeled Execute. The new screen displays the Power Up Diagnostic Results.

Test Completion

This completes the internal System Health Checks which are available for unit check-out. To turn the power off, disconnect the DC power source.

Enter the Serial Transfer Mode

To download, upload, or read system information over a serial port, the online unit must be in the Serial Transfer Mode. The PanelMate unit will remain in the ready state until the Configuration Software has initiated the transfer. Configuration files, drivers, executive firmware, and options can be downloaded to the PanelMate unit. The configuration file loaded in the PanelMate unit can be uploaded to the personal computer.

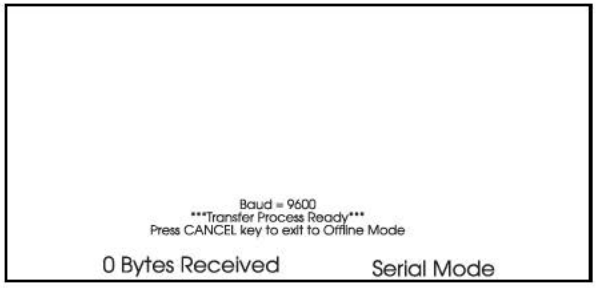


Figure 2-6 Serial Transfer Screen

Note that you may refer to the Display System Configuration Information screen before or after a transfer to verify configuration names, executive firmware versions, options, or drivers currently loaded in the system.

You can change the default communication rate in the PanelMate unit from the Configuration Software. (The default is 9600 baud.) When transferring information, the PanelMate Power Series unit uses port 1.

Enter the Network Transfer Mode

Note *The Network Executive Firmware and the network driver must be downloaded using the Serial Transfer Mode before you can transfer over a network.*

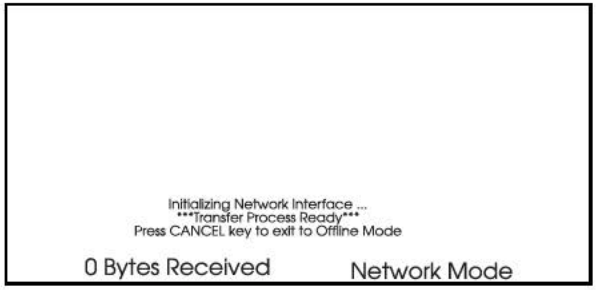


Figure 2-7 Network Transfer Screen

The Online Unit must have the Remote Transfer option installed and be in the Network Transfer mode to:

- Transfer Information
- Remotely place the PanelMate unit into Run Mode
- Read system information over a remote network

The PanelMate unit will remain in the ready state until the Configuration Software has initiated the transfer. Configuration files, drivers, executive firmware, and options can be downloaded to the PanelMate unit. The configuration file loaded in the PanelMate unit can be uploaded to the personal computer.

The PanelMate unit can also be remotely placed into Run Mode. For more information on remotely placing the PanelMate unit in Run Mode, refer to the topic System Info. Tab in the PanelMate Transfer Utility Online Help.

You may refer to the Display System Configuration Information screen before or after a transfer to verify configuration names, executive firmware versions, options, or drivers currently loaded in the system.

Display System Configuration Information

This selection displays current configuration information from the PanelMate Online unit.

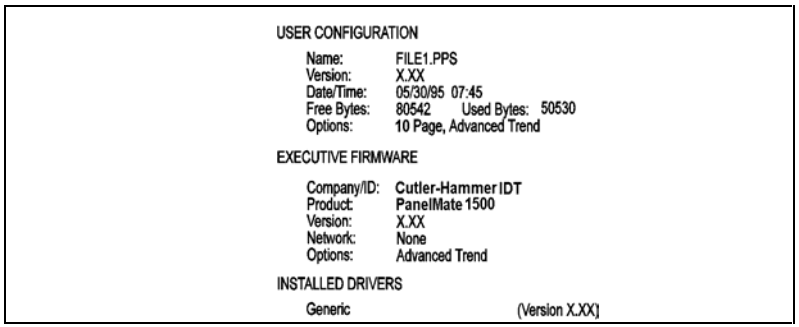


Figure 2-8 System Configuration Screen

Enter Run Mode

The Run Mode allows you to display the configuration downloaded to the PanelMate unit communicating to the PLC of your choice.

If the Remote Transfer option is installed, you can remotely place the PanelMate unit into Run Mode from your personal computer.

Note *If the value in the Remote Mode Change field in the System Parameters table is configured as IMMEDIATE, DEFAULT, or ACCEPT, you may also remotely change the PanelMate unit from Run Mode to the Network Transfer Mode from your personal computer. For more information on remotely placing the PanelMate unit into the Network Transfer Mode, refer to the topic System Info. Tab in the PanelMate Transfer Utility Online Help.*

To go to the Offline mode from the Run Mode:

1. Select Get Page from the default control buttons.
2. Select More.
3. Select Setup Page.
4. Select Enter Offline Mode.
5. Press Execute.

Calibrate Touchscreen

Touchscreen units have a calibration routine which must be performed to determine the boundaries of the video on your touchsceen.

Select the template labeled Calibrate Touchscreen and you see the screen shown in Figure 2-9.

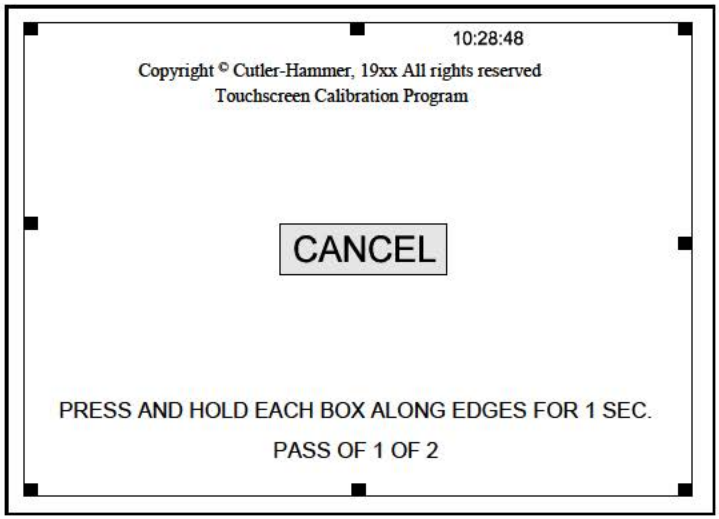


Figure 2-9 Touchscreen Calibration Screen

Press the eight small boxes around the edges of the screen to calibrate. Press the boxes in any order, but all boxes must be pressed to complete the calibration.

Each box turns green (a different shade of gray for grayscale units) when pressed. After the first pass, the boxes turn red (back to the original shade of gray) again to indicate the screen is ready for the second pass. After calibrating, you return to the Offline Mode menu.

Note *Calibration settings are retained when power is removed from the PanelMate unit.*

You can also access Calibrate Touchscreen routine in Run Mode from the Setup Page.

1. Select Get Page from the default control buttons.
2. Select More.
3. Select Setup Page.
4. Select the template labeled Calibrate Touchscreen.
5. Press Execute. You see the Calibrate screen shown above.

In this case, you return to the Setup Page after calibration is complete.

Installation in an Industrial Enclosure

3

In this chapter, you will learn:

- *How to install the PanelMate Power Series 1500 Unit in an industrial enclosure*
- *How to connect DC Power*
- *How to connect to the PanelMate Unit's serial ports*

Safety Considerations

When installed in accordance with the manufacturer's directions, into another enclosure, this equipment is suitable for use as an Enclosure Type 4, 4X, or Type 12.

This equipment is suitable for Class I, Division 2, Groups (A, B, C, D) or non-hazardous locations only.

Warning *Explosion hazard. Substitution of components may impair suitability for class I, Division 2.*

Avertissement *Risque d'explosion La substitution de composants puet rendre ce material inacceptable pour les emplacements de Classe I, Division 2.*

Warning *Explosion hazard. Do not replace components unless power has been switched off or area is known to be non-hazardous.*

Avertissement *Risque d'explosion Couper le courant ou s'assurer que l'emplacement es designe non dangereux avant de replacer le composants.*

Operator Station

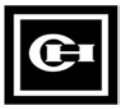
The PanelMate Power Series 1500 unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section describes installing the PanelMate unit, and installing the various available options. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about the accessories before proceeding with installation.

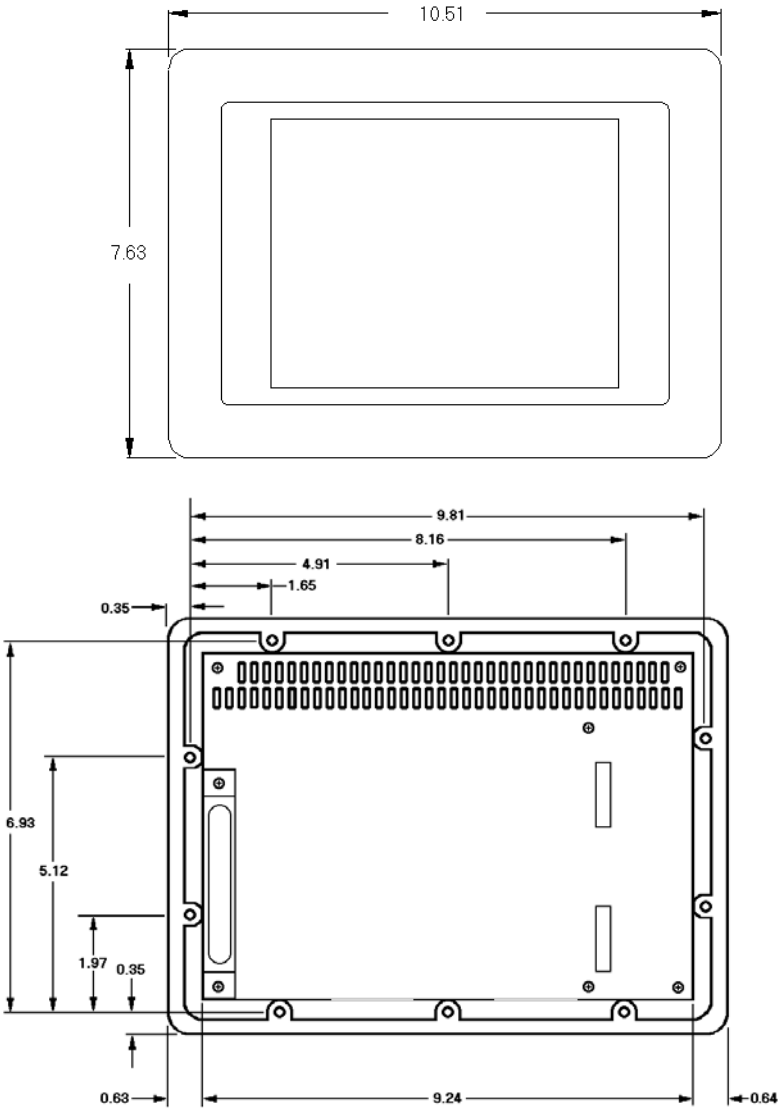
The instructions in this section assume you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate unit Outline drawing and Panel Cutout and Torque drawings on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate Unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix A. Appendix B contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

To ensure proper convection cooling, we recommend a minimum 2-inch clearance above and 2-inch clearance below the unit when installed in an industrial enclosure.



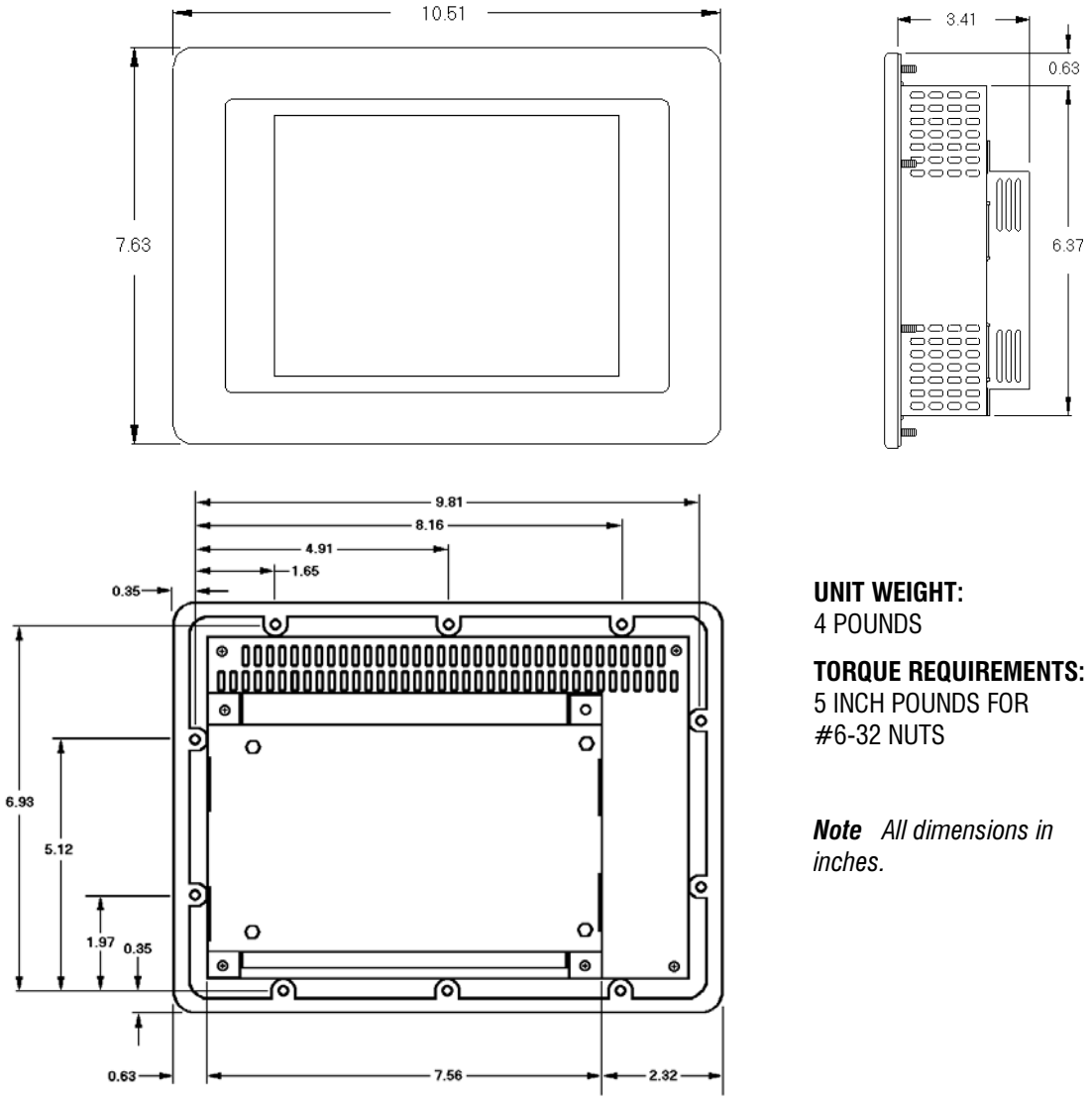


UNIT WEIGHT:
4 POUNDS

TORQUE REQUIREMENTS:
5 INCH POUNDS FOR
#6-32 NUTS

Note *All dimensions in inches*.

Figure 3-1 PanelMate Power Series 1500 (Touchscreen Unit) Outline



UNIT WEIGHT:
4 POUNDS

TORQUE REQUIREMENTS:
5 INCH POUNDS FOR
#6-32 NUTS

Note *All dimensions in inches.*

Figure 3-2 PanelMate Power Series 1500 (Touchscreen Unit) with AcceleratI/On Outline

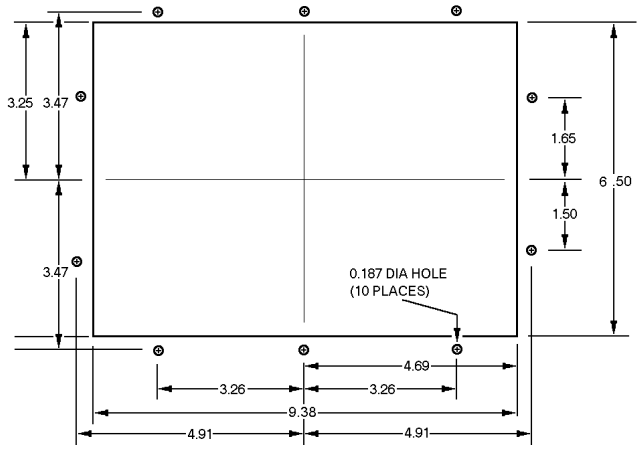


Figure 3-3 (Touchscreen Unit) Cutout And Torque Limits

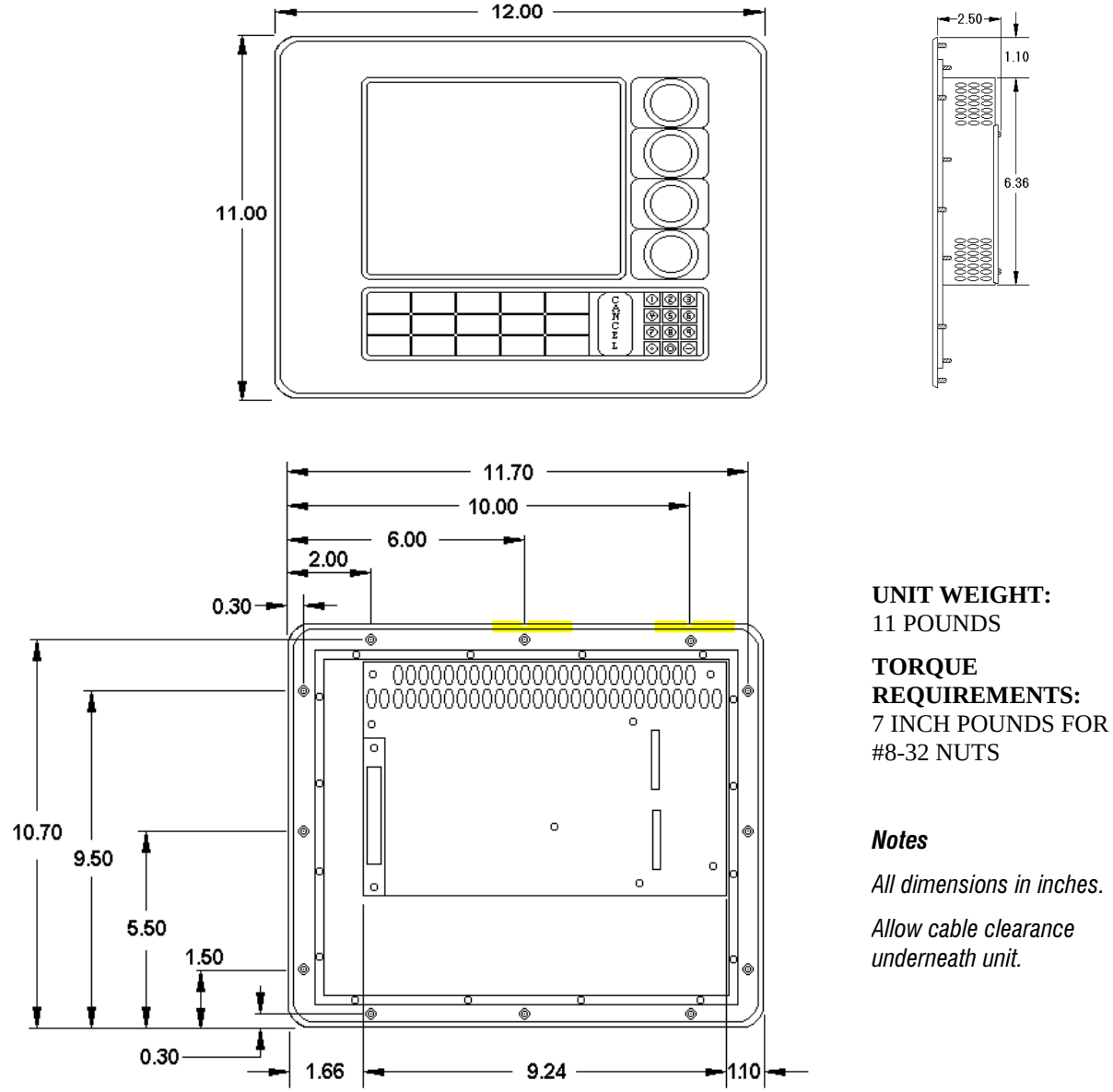
TORQUE REQUIREMENTS

5 INCH POUNDS FOR # 6-32 NUTS

Note *All dimensions in inches.*

Caution

Be careful when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tight enough to strip the threads or damage the gasket.



UNIT WEIGHT:
11 POUNDS

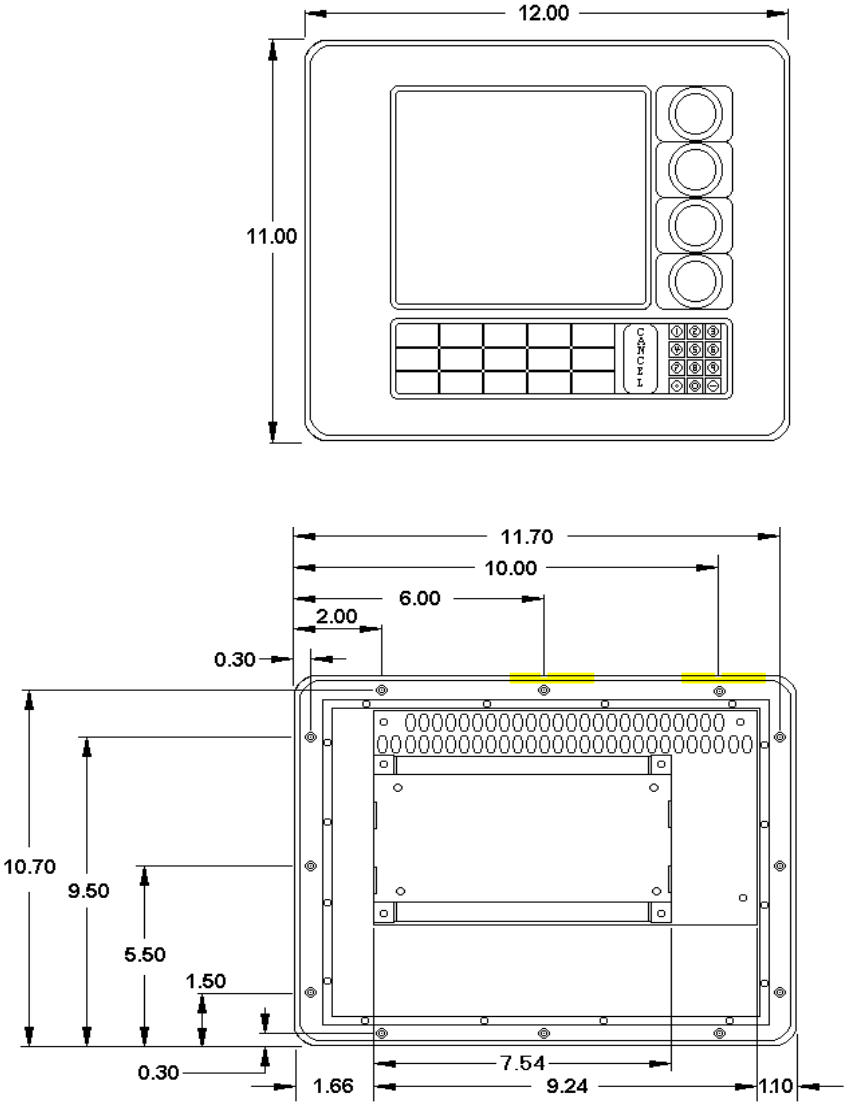
TORQUE REQUIREMENTS:
7 INCH POUNDS FOR #8-32 NUTS

Notes

All dimensions in inches.

Allow cable clearance underneath unit.

Figure 3-4 PanelMate Power Series 1500 (Keypad Unit) Outline



UNIT WEIGHT:
11 POUNDS

TORQUE REQUIREMENTS:
7 INCH POUNDS FOR #8-32 NUTS

Notes

All dimensions in inches.

Allow cable clearance underneath unit.

Figure 3-5 PanelMate Power Series 1500 (Keypad Unit) with AcceleratI/On Outline

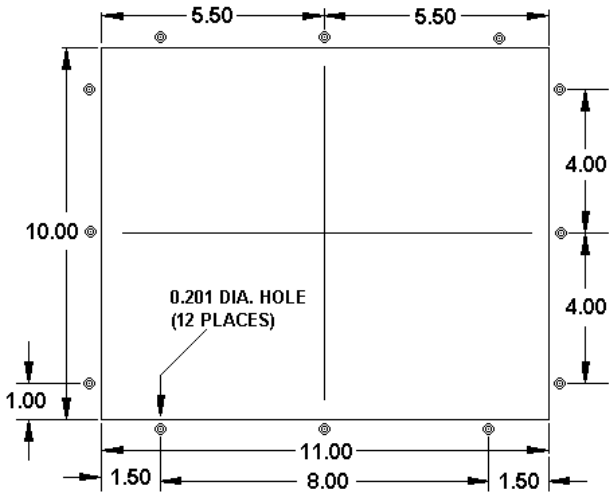


Figure 3-6 (Keypad Unit) Cutout And Torque Limits

TORQUE REQUIREMENTS

5 INCH POUNDS FOR # 6-32 NUTS

Note *All dimensions in inches.*

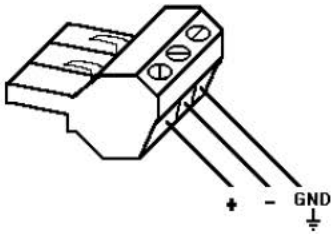
Caution

Be careful when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tight enough to strip the threads or damage the gasket.

Connect DC Power

The DC power connector receptacle is located on the bottom of the PanelMate Power Series Unit. The unit operates at 24 VDC -15% / + 20% @ 12W. The removable connector is shipped in a plastic bag. Connect your DC power with user-supplied wiring.

Note *Power conditioning may be required when the PanelMate unit is installed in areas of poor power quality.*



The DC input common (- terminal) and the chassis GND ⏚ terminal are both internally connected to the PanelMate unit chassis

Figure 3-7 Three-Position DC Power Connector

Connection to Serial Ports

Serial ports can be used for printers, for PLC (Host) communications, or for connection to a personal computer for upload or download.

Serial Port 1 has two connectors. One connector is an RS232 port with an RJ-11 connector, and the other is an RS422/RS485 port with an RJ-45 connector.

Wire the side opposite the clip.

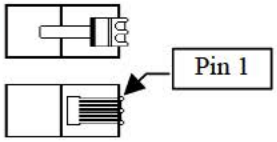
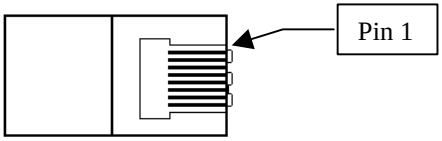


Figure 3-8 RJ-11 Connector

Pin	Description
1	Signal Ground
2	Clear To Send
3	Receive Data
4	Request To Send
5	Transmit Data
6	Do not use

Caution

If you are using Serial Port 1, use only one port (RS232 or RS422/RS485) at a time. If both connections are used simultaneously, communication errors will result which may cause hazardous conditions when communicating with a PLC.



Wire the side opposite the clip.

Figure 3-9 RJ-45 Connector

Pin	Description
1	TX- (Transmit Data)
2	TX+ (Transmit Data)
3	220 Ohm Termination
4	120 Ohm Termination
5	RX- (Receive Data)
6	RX+ (Receive Data)
7	AC (AC Termination)
8	TRM (Termination)
9	SHD (Shield)

Serial Port 2 has one connection, an RS232 port with an RJ-11 connector.

Serial port configuration is done in the Configuration Software. For more information on serial port configuration, refer to the topic PLC Name and Port Table in the PanelMate Configuration Editor Online Help.

Connection to a Personal Computer

The PanelMate Unit connects to a PC for the transfer of information. You can purchase a serial cable from Cutler-Hammer for an RJ-11 to 9-pin cable connection between a PanelMate Unit and a PC. If your personal computer has a 25-pin port, you can construct a cable using the pinouts in Figure 3-7.

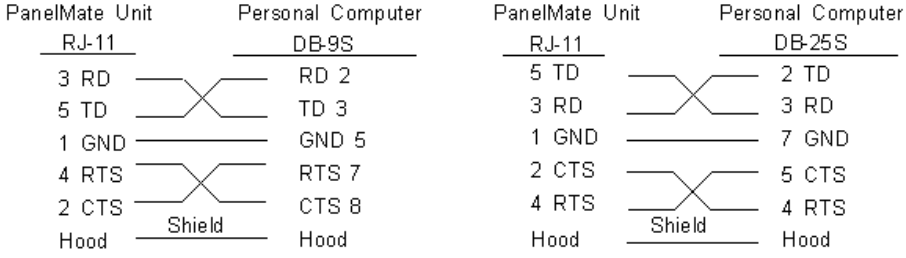


Figure 3-10 Serial Transfer Cable

Network Termination

When you install a PanelMate unit at the end of a network, you may have to terminate the serial port. This can be done by:

- Using the optional Multi-Drop Adapter (See Appendix C).
- Adding jumper wires to the external RJ-45 cable plug. This selects terminating resistors mounted within the PanelMate unit. The table on the following page shows where to place the jumpers.

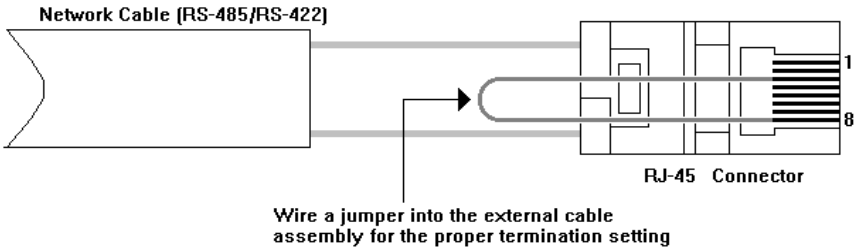


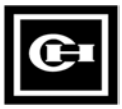
Figure 3-11 RJ-45 Network Termination

Note *The cable jacket must be crimped into the connector for proper strain relief.*

Note *The cable shield wire must contact the connector shield for proper grounding.*

The following table lists the recommended termination for serial communication with the PanelMate Unit. To set the termination of your serial port, add jumpers as shown below.

Communication Protocol	Jumper Position	Termination
RS232	None	None
DH485	8-7	120 Ohm AC coupled
RS422/RS485		Use the PLC manufacturers recommended value:
	8-3	220 Ohm - For a typical installation
	8-4	120 Ohm - For a high noise environment or extreme cable distances
	None	Use this setting for PanelMate units not the end node on a network.



Regular Maintenance

4

In this chapter, you will learn what regular maintenance the PanelMate Power Series 1500 Unit requires.

Regular Maintenance

Very little regular maintenance is required to keep your PanelMate Unit in perfect running condition.

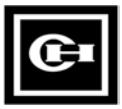
Clean the face of the unit, as needed, with any common, non-abrasive cleaning product.

Every 3 to 6 months, run the system diagnostics described in Chapter 2.

Disconnect DC power before conducting the following procedures...

You should mount the PanelMate Unit in a closed industrial enclosure. However, periodically use forced air to blow off any dust accumulation on the circuit boards if the PanelMate Unit is operating unprotected in a dusty environment (e.g., mounted in a control panel whose door is often left open).

There are no user replaceable fuses or batteries inside the PanelMate Unit.



Troubleshooting Guide

5

This chapter is provided to help you determine if problems you are having with the PanelMate Power Series 1500 Unit:

- *Can be readily solved on your own*
- *Require help from the Cutler-Hammer Customer Service Department*

Please try the recommended solutions to your problem before contacting your local distributor.

Problems with the Display

No characters on the display

Make sure your power source is actually supplying power to the PanelMate Unit.

Problems with the Touchscreen

Touchscreen is not performing reliably

Run the Touchscreen test as described in Chapter 2.

Problems with the TouchPanel

Keyboard does not work

Check the integrity of the cable and connectors.

One or several membrane keys do not work

Use the Keyboard Test to ensure the keys are sending a signal to the PanelMate unit. (Refer to the topic Execute System Diagnostics in Chapter 2).

Problems with the Control Buttons

One or several buttons do not work

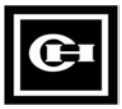
Use the Keyboard Test to ensure the keys are sending a signal to the PanelMate unit. (Refer to the topic Execute System Diagnostics in Chapter 2).

Problems with the Serial Port

Cannot establish communication using the serial port

Check cable integrity to ensure there are no missing pins or broken wires.

Ensure the communication parameters (baud rate, stop bits, parity, etc.) are the same in both the Operator Station and the PLC.



Problems when Transferring Memory

Cannot make a personal computer transfer

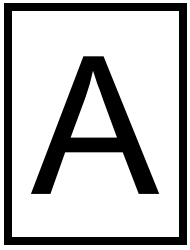
Make sure that the cable connecting the personal computer serial port to the Operator Station serial port is the one supplied by Cutler-Hammer.

Check the integrity of the Operator Station communications port. Do this by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics.

Cannot download from the personal computer

The file you are attempting to load from the personal computer may be corrupted. Re-save the configuration to the personal computer, then try to transfer the configuration again.

Detailed Specifications



This chapter presents specific information about the PanelMate Power Series 1500 Unit.

Specifications

Main Processor

CPU	16 bit microprocessor running at 16 MHz
Memory	1 MB flash memory for program storage, fonts, and messages
	2 MB DRAM (Standard Capacity Units)
	3 MB DRAM (High Capacity Units)
Real-Time Clock	Non-volatile memory. Internal lithium battery has a minimum ten year life

Display

7.4" VGA (640 x 480) grayscale LCD flatpanel

8.0" VGA (640 x 480) dual-scan color LCD flatpanel

8.0” VGA (640x480) TFT color flatpanel

All displays feature a field-replaceable back light and a digital touchscreen.

Environment

Temperature	Operating:	0 to 50ºC (grayscale) 0 to 40ºC (color)
	Storage:	-20 to 60ºC
Humidity Noncondensing		20%-80% (Grayscale) 20%-90% (Color)
NEMA Class		NEMA 4X when properly mounted in a correspondingly rated enclosure.

Environment (Cont.)

When installed in accordance with the manufacturer's directions, into **another enclosure**, this equipment is suitable for use as an Enclosure Type 4, 4X, or Type 12.

This equipment is suitable for Class I, Division 2, Groups (A, B, C, D) or non-hazardous locations only.

Warning *Explosion hazard. Substitution of components may impair suitability for class I, Division 2.*

Avertissement *Risque d'explosion La substitution de composants puet rendre ce material inacceptable pour les emplacements de Classe I, Division 2.*

Warning *Explosion hazard. Do not replace components unless power has been switched off or area is known to be non-hazardous.*

Avertissement *Risque d'explosion Couper le courant ou s'assurer que l'emplacement es designe non dangereux avant de replacer le composants.*

Vibration	Operating:	1g at 10-500 Hz
Shock	Operating:	30g
	Non-operating:	30g
Pollution		Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level

Electrical Requirements

Voltage	24 VDC - 15% / + 20% @ 12W (with AcceleratI/On communications option installed).
Current	0.5A (with AcceleratI/On communications option installed).
Peak Inrush Current	35A (duration less than 15 μs).

Serial Ports

Rate Selectable:	110 to 19,200 baud
Serial Port 1 Configuration	Serial Port 1 has one RJ-11 connection for RS232 communication and one RJ-45 connection for RS422 and 485-2 communication.
Serial Port 2 Configuration	Serial Port 2 has one RJ-11 connection for RS232 communication.

Warning

Use only one Port 1 serial connection at a time. Using two connections simultaneously will cause communications errors which may cause hazardous conditions when communicating with a PLC.

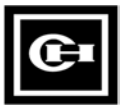
Other

PanelMate Power Series 1500 (Touchscreen Version)

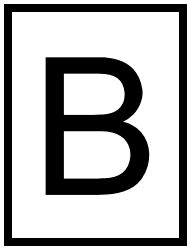
Weight	5 pounds (with AcceleratI/On communications option installed)
Equipment Heat	41 BTU/hr. (12 watts) Output

PanelMate Power Series 1500 (Keypad Version)

Weight	11 pounds (with AcceleratI/On communications option installed)
Equipment Heat	41 BTU/hr. (12 watts) Output



Installation Guidelines



In this chapter, you will learn:

- *Physical Installation Considerations*
- *Environmental Considerations*
- *Wiring Considerations*

Overview

This chapter explains important considerations for installation of the PanelMate Power Series 1500 Unit.

Physical Installation Considerations

Choosing where and how to mount your equipment is the first step in assuring its proper operation and long life.

The installation should protect your system from oil, dust, moisture, corrosive vapors, and other airborne contaminants. PanelMate Power Series Units provide a NEMA 4X rating when mounted in a correspondingly-rated enclosure.

When choosing an enclosure or mounting position, allow a good amount of free space around your unit. Leave at least two inches above and below the unit and one inch on either side. PanelMate Power Series units depend on this room to allow convection cooling of their interiors.

Convection cooling draws a vertical column of air upward over internal circuitry through vents in the unit. This cooling air must not exceed the maximum specified ambient temperature. Placing a PanelMate Unit on a horizontal surface blocks vents on the bottom of the unit, inhibiting convection cooling and causing damage to the unit.

Careful enclosure sizing is important for proper heat dissipation. Since other devices mounted in the same enclosure can also generate heat, consider the heat output of all equipment to be mounted in a given enclosure when choosing its size.

If the inside temperature of the enclosure is above the units recommended range (see tables B-1 and B-2), you can use filtered fans, heat exchangers, air conditioners, or switch to a larger enclosure to lower the temperatures. Keep in mind that your system will be more reliable and have a longer life if it is exposed to environmental conditions within the recommended range.

Since hot air rises to the top of an enclosure, the temperature inside can vary greatly from the bottom to the top. A fan can be used to circulate air within the enclosure and maintain a more uniform temperature top-to-bottom.

Also remember to leave room for easy access to circuit boards, wiring or cabling connections and regular maintenance. Detailed panel cutout drawings are found in Chapter 3, Installation in an Industrial Enclosure, of this installation guide for easy reference.

Your enclosure should be constructed of steel. This will help guard your unit against electromagnetic interference. It also provides good heat dissipation and proper structural support.

If an air-purged enclosure is used, it is recommended that the inside/outside pressure differential not exceed 0.5 PSI (13.8 inches water column).

Use caution when shipping an enclosure with your equipment mounted inside. This may seriously damage the equipment. If possible, units should be shipped in their original packing material, then mounted in an enclosure when it reaches its final destination.

A table has been developed to help in your selection of a free-standing enclosure. It is based on the following assumptions:

- a 14 gauge cold rolled steel enclosure
- 12 watts dissipated by the unit
- no additional methods of cooling
- the enclosure having all sides uninsulated
- at least 2-inches between the unit and the top and bottom of the enclosure

From this chart, you can predict how much the internal temperature will rise with different size enclosures.

This table is offered to you as an aid in the selection of enclosures to be used with our product. Cutler-Hammer offers no guarantee or warranty to the specific applicability of this table as actual conditions may vary and methods of the use of our product are beyond our control.

The ultimate responsibility for the products conformance to published specifications lies with you, the customer. For specific information about enclosure selection and cooling methods, contact your enclosure vendor.

Enclosure Size vs Internal Temperature Rise	
Standard Enclosure Size (Inches)	Internal Temperature Rise
12x12x4	11.4°C
12x12x6	10.8°C
12x14x6	9.8°C

Table B-1 Heat Output Specification (Touchscreen)

Enclosure Size vs Internal Temperature Rise	
Standard Enclosure Size (Inches)	Internal Temperature Rise
16x16x4	6.8°C
16x16x6	6.2°C
20x16x6	5.6°C

Table B-2 Heat Output Specification (Keypad)

Environmental Considerations

Cutler-Hammer equipment is designed and tested to operate over a wide temperature range. Temperatures outside this range can severely shorten the life of your system. High humidity, vibration, shock, or altitude can also adversely affect your systems operation and lifespan.

See the following figures for a list of environmental operating parameters for the PanelMate Power Series 1500 Unit.

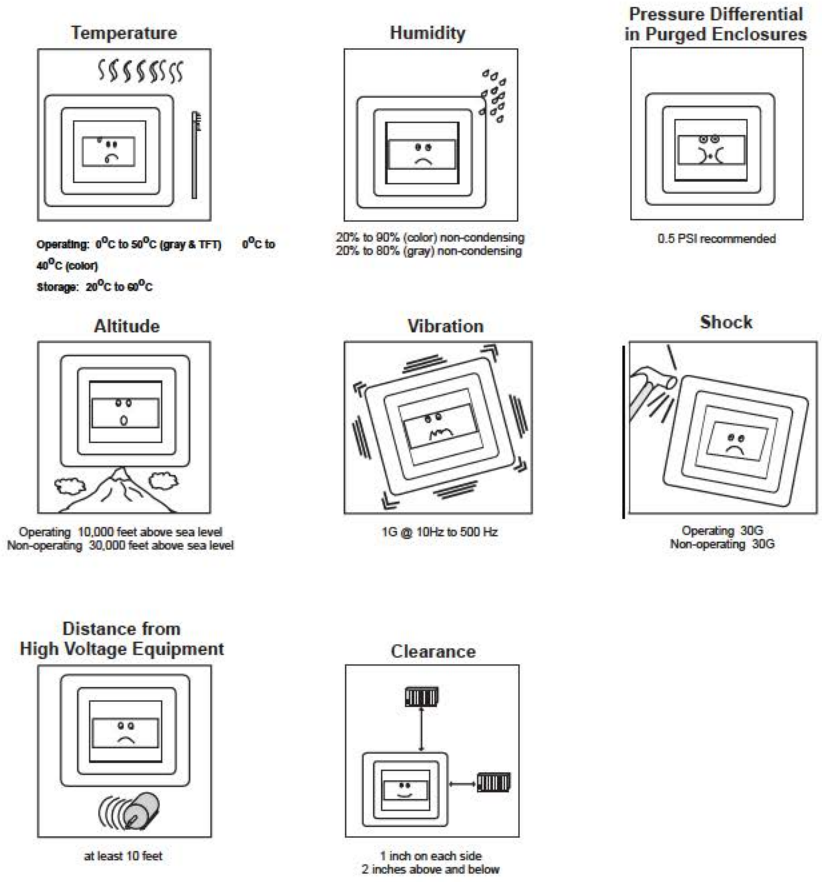


Figure B-1 Environmental Operating Parameters

Locate your system as far as possible from transformers, relays, motor starters, and power or high-voltage (Type A) wiring. Maintain at least ten feet between your system and this type of equipment. This equipment generates interference which can induce noise in electrical wiring.

All equipment should be properly grounded at a ground run separate from that used by high-power devices such as motor starters and arc welders.

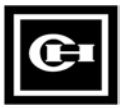
Cutler-Hammer cannot advise nor accept liability regarding placement of our equipment in hazardous environments. If this is a requirement in your application, contact a vendor experienced in placing electronic equipment in hazardous environments.

Wiring Considerations

Another important concern should be the proper installation of wiring or cabling for your unit.

When planning the location and placement of wiring, make sure that high-power lines are not in close proximity to low-level signal or communication cables. High-power conductors (Type A) include AC power lines and high power AC or DC I/O lines, such as those which connect to hard-contact switches, relays, solenoids, motors, generators and arc welders. These generate a large amount of electrical noise which can interfere with the operation of your equipment.

Low-signal-level conductors (Type B) include those carrying serial communication and local area networks such as Ethernet and PLC networks. These have a low tolerance for induced electrical noise. All low level wiring should be shielded and routed in a separate conduit or raceway from high-power wiring. All raceways and conduit must be properly grounded.



Route low-level conductors at least one foot from 120V AC power lines, two feet from 240V AC power lines, and three feet from 480V AC power lines. If a low level conductor must cross high power lines, it should do so at a right angle.

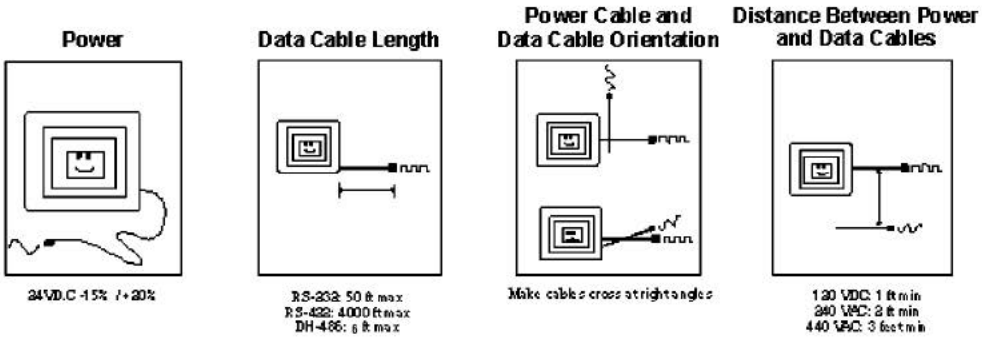
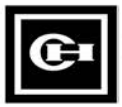


Figure B-2 Power and Wiring Specifications

Most RS232 serial communication cables should be no longer than 50 feet long. Some devices or high-noise environments may require shorter cabling. The effects of electrical noise can be reduced by using cables with twisted-pair conductors. This method uses one conductor of a twisted pair for a data transmit or receive line, and connects the second conductor of that pair to ground. Signal ground is run by paralleling two conductors of a twisted pair and using them as a single conductor. Higher noise immunity and distance can be achieved by using RS422 or 20 mA current loop communication. All communication cables should be shielded, with the shield properly terminated at each end.

If there are significant voltage differences (6 volts) between the grounds of two devices which must be connected, the devices should be electrically isolated from each other. This can be accomplished with optical, fiber optical, or transformer isolators.

Follow manufacturers instructions for installation of local area network and other communication cabling. High frequency communication often requires special conductors and precautions to guard against signal reflections. External high-frequency disturbances may require grounding of cable shields at both ends or at multiple points along the run.



Accessories and Options

C

In this chapter, you will learn about the accessories and options available for the PanelMate Power Series Unit.

For more information about accessories and options for your PanelMate Power Series Unit, contact your local distributor.

Accessories

Transfer Cable

RS232 cable with a DB-9 connector and RJ-11 connector for upload/download between the standard personal computer communication port and the PanelMate Power Series Units serial port 1.



PLC Cables

PLC cables ensure proper communication between your Operator Station and your PLC.



Multi-Drop Adapter

The Multi-Drop Adapter (MDA) consists of a small metal box with cable connectors used to connect the PanelMate Unit to a network via a Tee connection.

The MDA contains internal terminating resistors used to terminate the network if the MDA is the final node (at the end of the network). External terminating resistors can also be used so the PanelMate Unit can be removed without disrupting the termination.

Since the MDA has both RJ-45 connectors and Phoenix type screw connectors, it can convert from the standard 20 or 22 gage network wires to the 26 gage needed for the RJ-45 connections.

Cable-Making Kit

The Cable-Making Kit is used to create your own cables using the wiring diagrams supplied by Cutler-Hammer.

The Cable-Making Kit consists of:

- Wire
- An assortment of connectors
- A crimping tool
- General instructions for making cables

Options

Allen-Bradley DH-485 (SLC-500) Communications (#1525)

This option is a one-time use diskette. Licensed under Allen-Bradley patented technology, this option enables communications to Allen-Bradley SLC 500 PLCs through the DH-485 network in a single target PanelMate Online unit.

The Allen-Bradley 1747-AIC module is only required when simultaneous interface to the PanelMate Unit and to PLC programming equipment is desired.

This option requires Windows Configuration Software Option #0620 or #06AB to configure communications to Allen-Bradley PLCs.

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