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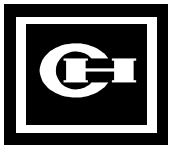
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Hardware Installation Guide

PanelMate Power Series



Cutler-Hammer

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Preface

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

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About This Manual

Purpose

This manual describes hardware installation of the PanelMate Power Series 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

Appendix A: Detailed Specifications

Appendix B: Installation Guidelines

Appendix C: Accessories And Options

Index



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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.

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If you have Internet capabilities, you also have access to technical information via our website at http://www.cutler-hammer.eaton.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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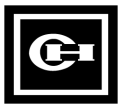
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Introduction

1

In this chapter, you will learn:

- *How to use this manual*
- *Customer Support And Services*

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How to use this Manual

Welcome to the Cutler-Hammer PanelMate Power Series Hardware Manual. This manual contains everything you need to know about the assembly, installation, operation, and maintenance of a PanelMate unit

PanelMate units can have up to 15 pages and 500 messages, or 100 pages and 5000 messages, depending on your unit. Appendix C gives details of available options.

The terms PanelMate Power Series and PanelMate unit will be used to describe features common to the PanelMate Power Series: 2000, 3000, 4000, and 5000. Features unique to a particular PanelMate Power Series model will be noted as such.

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

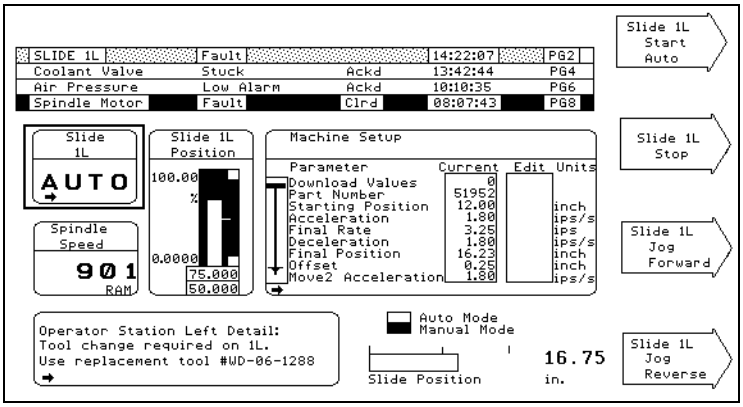


Figure 1-1 Example Page

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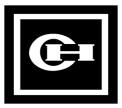
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2. Expedite an existing order.
3. Product assistance and product price information.
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Hardware Checkout Overview

2

In this chapter, you will learn:

- *How to set-up the PanelMate unit for checkout*
- *How to attach the Audio Feedback Kit*
- *How to attach the optional Security Keyswitch*
- *How to check system health*
- *How to set the real-time clock*

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Unpacking

Carefully remove all equipment from the packing cartons and inspect all parts for damage in shipment. Check the 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 and immediately call the company 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.

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

On the following pages are checklists for these PanelMate unit models.

- PanelMate 2000 Grayscale Keypad Unit
- PanelMate 2000 Color Keypad Unit
- PanelMate 3000 Keypad Unit
- PanelMate 4000 (Split Architecture) Keypad Unit
- PanelMate 4000 Keypad Unit
- PanelMate 5000 (Split Architecture) Keypad Unit
- PanelMate 5000 Keypad Unit
- PanelMate 3000 Touchscreen Unit
- PanelMate 4000 Touchscreen Unit
- PanelMate 5000 Touchscreen Unit

Please check to ensure all items are present for your PanelMate unit.



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Checklists

PanelMate 2000 Grayscale Keypad Unit

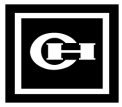
- 1 PanelMate Series 2000 Grayscale Keypad Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #8 nuts, 16 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 2000 Color Keypad Unit

- 1 PanelMate 2000 Color Keypad Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #8 nuts, 16 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 3000 Keypad Unit

- 1 PanelMate 3000 Keypad Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #8 nuts, 16 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing



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PanelMate 4000 (Split Architecture) Unit

- 1 PanelMate 4000 Keypad Unit with Cable
- 1 TouchPanel
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #10 nuts, 16 #10 washers, 12 #8 nuts, 12 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 4000 Keypad Unit

- 1 PanelMate 4000 Keypad Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 18 #10 nuts, 18 #10 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 5000 (Split Architecture) Keypad Unit

- 1 PanelMate 5000 Keypad Unit with cable
- 1 TouchPanel
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #10 nuts, 16 #10 washers, 12 #8 nuts, 12 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing



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PanelMate 5000 Keypad Unit

- 1 PanelMate 5000 Keypad Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
- 1 Packet of mounting nuts and washers - 18 #10 nuts, 18 #10 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 3000 Touchscreen Unit

- 1 PanelMate 3000 Touchscreen Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 16 #8 nuts, 16 #8 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

PanelMate 4000 Touchscreen Unit

- 1 PanelMate 4000 Touchscreen Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers - 18 #10 nuts, 18 #10 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing



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PanelMate 5000 Touchscreen Uni

- 1 PanelMate 5000 Touchscreen Unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
  - 1 Packet of mounting nuts and washers 18 #10 nuts, 18 #10 washers
  - 2 two-terminal connectors
  - 1 three-terminal connector
  - 1 Cutout/torque drawing

If you ordered a **Mounting Collar Kit** as an accessory for a PanelMate 2000 Keypad uni, it will be packaged separately:

- 1 Mounting Collar
- Packeted mounting hardware - 16 #8 nuts, 16 #8 washers
- 1 Cutout/torque drawing
- 1 Gasket

If you ordered a **Mounting Collar Kit** as an accessory for a PanelMate 4000 (Split Architecture) Keypad Unit, it will be packaged separately:

- 2 Mounting Collars
- Packeted mounting hardware - 14 #10 nuts, 14 #10 washers - 12 #8 nuts, 12 #8 washers
- 1 Cutout/torque drawing
- 2 Gaskets

If you ordered a **Mounting Collar Kit** as an accessory for a PanelMate 4000 Keypad Unitt, it will be packaged separately:

- 1 Mounting Collar
- Packeted mounting hardware - 22 #8 nuts, 22 #8 washers
- 1 Cutout/torque drawing
- 1 Gasket



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If you ordered a **Support Kit** as an accessory for a PanelMate unit, it will be packaged separately:

- 1 Transfer Utility with manual
- 1 Packet of mounting nuts and washers containing - 18 #8 nuts, 18 #8 washers, 18 #10 nuts, 18 #10 washers
- 1 Packet of connectors - 2 two-terminal connectors - 1 three-terminal connector
- 1 Packet with a three-terminal connector
- 8 Cutout/torque drawings
- 1 22.5 mm security keyswitch (with 2 keys)

If you ordered an **Audio Feedback Kit** as an accessory, it will be packaged separately:

- 1 Speaker with 24-foot connecting cable attached

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

- 1 PLC cable

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

- 1 Serial Transfer cable



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Attaching the Keypad Unit Keyboard: PanelMate Split Architecture

Note This procedure is for Split Architecture units only.

To attach the keyboard to the Keypad Unit and ensure proper grounding, follow this procedure.

1. Plug the keyboard cable into the keypad.
2. Ensure that the keyboard metal clamp is over the braided shield area of the cable.
3. Place the star washer between the keypad standoff and the keyboard cable metal clamp.
4. Place the flat washer next to the keyboard cable metal clamp.
5. Tighten the screw to secure the keyboard cable.

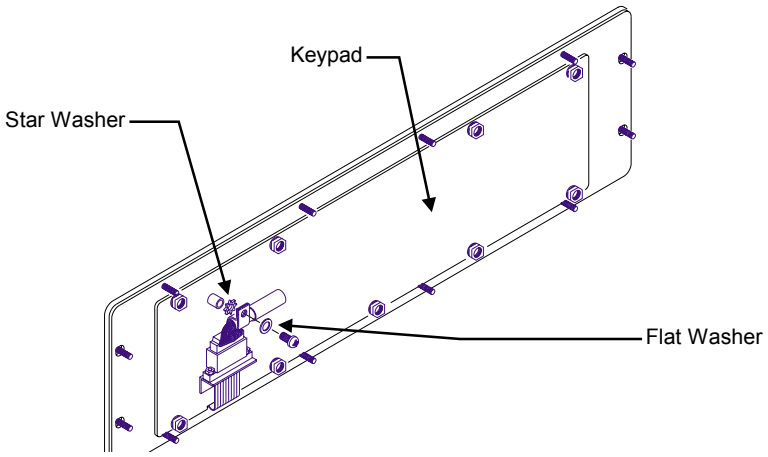


Figure 2-1 PanelMate 4000 & 5000 Keypad Unit Keyboard

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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 the following procedure:

1. Connect to AC Power.
2. Attach the optional Audio Feedback Kit.
3. Attach the optional Security Keyswitch.
4. Power Up the Unit.
5. Execute the System Diagnostics:
   - Set Date and Time
   - Perform Display Tests
   - Perform Keypad Test
   - Check Audio Output, Fault Relay, and Test Battery

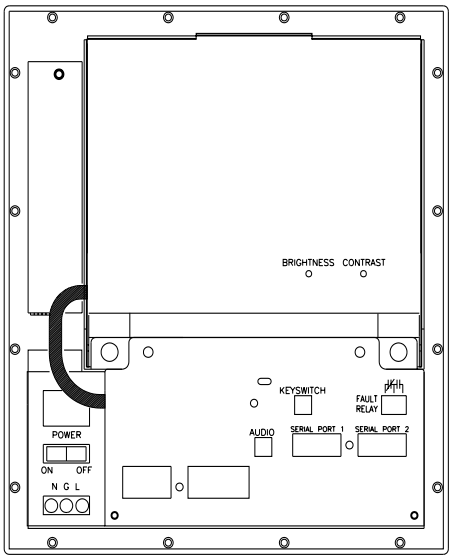


Figure 2-2 PanelMate 2000 Grayscale Keypad Unit Rear View

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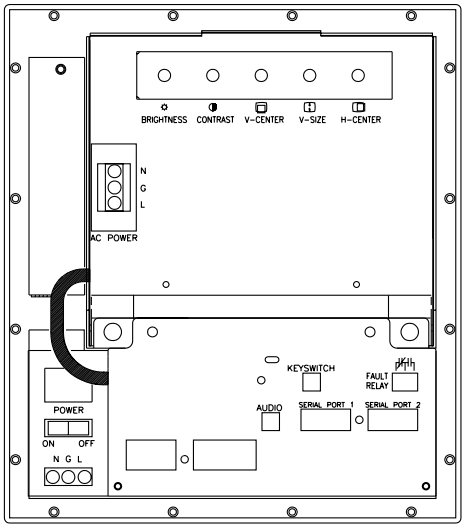


Figure 2-3 PanelMate 2000 Color Keypad Unit Rear View

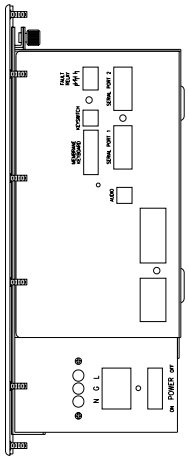


Figure 2-4 PanelMate 3000 Keypad Unit Side View

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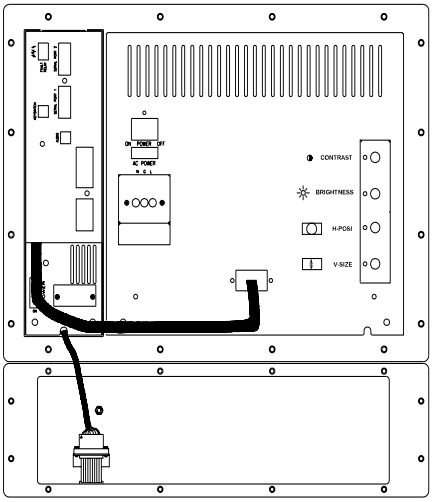


Figure 2-5 PanelMate 4000Keypad Unit Rear View

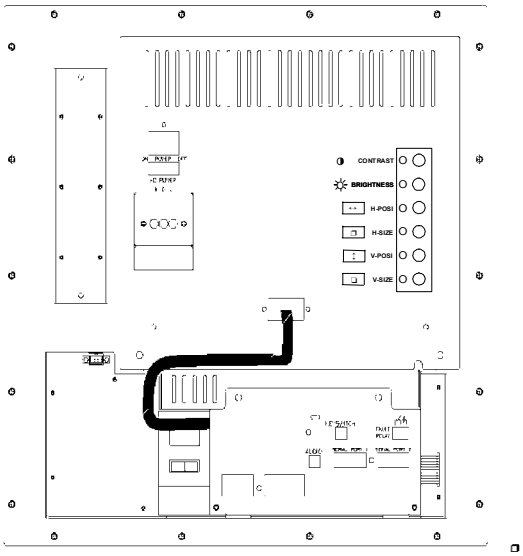


Figure 2-6 PanelMate 4000 Keypad Unit Rear View

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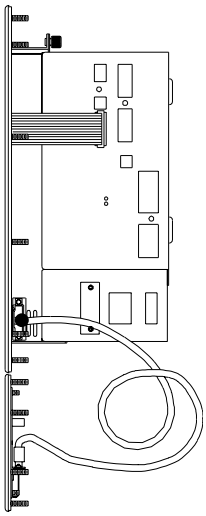


Figure 2-7 PanelMate 5000 Keypad Unit Side View

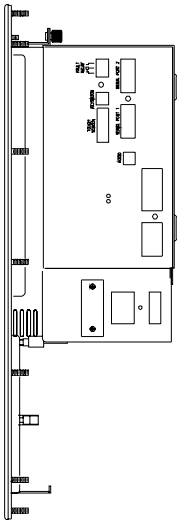


Figure 2-8 PanelMate 5000 Keypad Unit Side View

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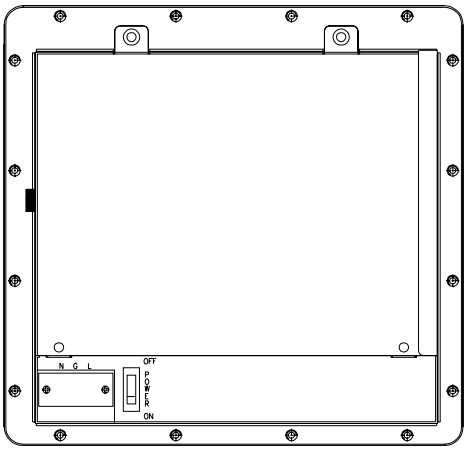


Figure 2-9 PanelMate 3000 Touchscreen Unit Rear View

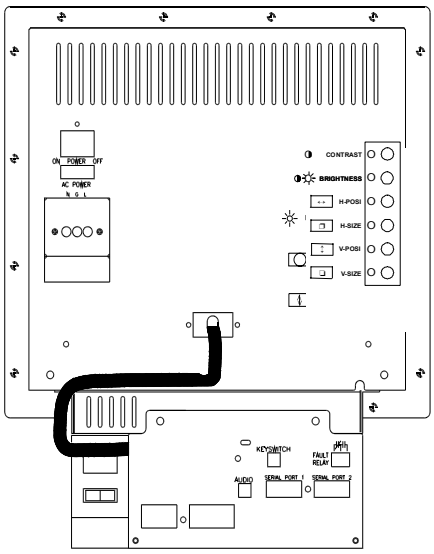


Figure 2-10 PanelMate 4000 Touchscreen Unit Rear View

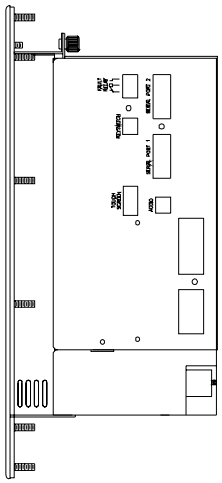


Figure 2-11 PanelMate 5000 Touchscreen Unit Side View

Connect AC Power

The AC power terminals and switch are on the back of the PanelMate 2000 and 4000, and on the side of the PanelMate 3000 and PanelMate 5000.

Ensure the rocker switch is **OFF**. Remove the protective cover. Connect your AC power with user-supplied wiring.

Note For PanelMate 2000 Color and PanelMate 4000 units, the monitor and Electronics Module require individual power connection.

The PanelMate unit is auto-sensing and automatically adjusts to operate at either 120V AC or 230V AC. Replace the protective cover over the AC wiring.

Note Power Conditioning may be required when the PanelMate unit is installed in areas where the power quality is poor.

N = Neutral - White Wire (typical)
G = Ground - Green/Yellow Wire (typical)
L = Line (Hot) - Black Wire (typical)

Recommended minimum wire size is 0.82mm^2 (18 AWG).

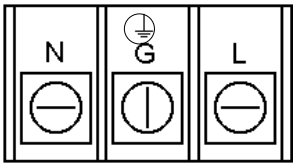


Figure 2-11 Terminal Block

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Attach Audio Feedback Kit

The Audio Feedback Kit is an optional accessory to the PanelMate unit.

To attach the speaker to the unit, remove it from the shipping box and connect the cable to the two-terminal connector which plugs into the terminals labeled "AUDIO". The connector is shipped in a small plastic bag with the unit.

Attach Security Keyswitch

The Security Keyswitch, an optional accessory to the PanelMate unit, is included in the Hardware Support Kit.

To attach the Security Keyswitch to the unit, unpack it and connect it with user-supplied wiring to the two-terminal connector which plugs into the terminals labeled "KEYSWITCH". Note that this is a contact closure and voltage should not be applied. The connector is shipped in a small plastic bag with the unit.

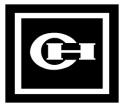
Power Up the Unit

To power up the unit, follow the steps below:

1. Switch the power on. For PanelMate 2000 Color and PanelMate 4000, power up both the monitor and the Electronics Module.

Note This sequence occurs at initial power-up, or when the unit is recovering from a power interruption.

2. The PanelMate unit performs internal diagnostic checks, and the screen displays a listing of the diagnostic checks as they are executed. With PanelMate 2000 or PanelMate 4000 units, you may also hear a monitor “crackle”. This is normal. If there is a failure, see the troubleshooting guide in Chapter 5.
3. The PanelMate unit returns to the state it was in when powered off.
   - If the PanelMate unit was in the Offline Mode, it will return to the Offline Mode and display the Offline Mode menu.
   - If the PanelMate unit was in the Run Mode, it will return to the Run Mode and go to the Startup Page defined by the configuration loaded into the unit. The unit must be in the Offline Mode to run the diagnostic checks.



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Go To Offline Mode

To enter the Offline Mode from the Run Mode, follow these steps:

1. Select the **Get Page** control button from the default control buttons.
2. Select the **More** control button.
3. Select the Enter Offline Mode template.
4. Press the **Execute** control button to display the Offline Mode menu.

After the PanelMate unit completes the diagnostics, proceed to the next section.

Offline Mode Menu

The offline Mode menu displays six selections which are described below.

Note: Keypad units do not display the Calibrate Touchscreen selection.

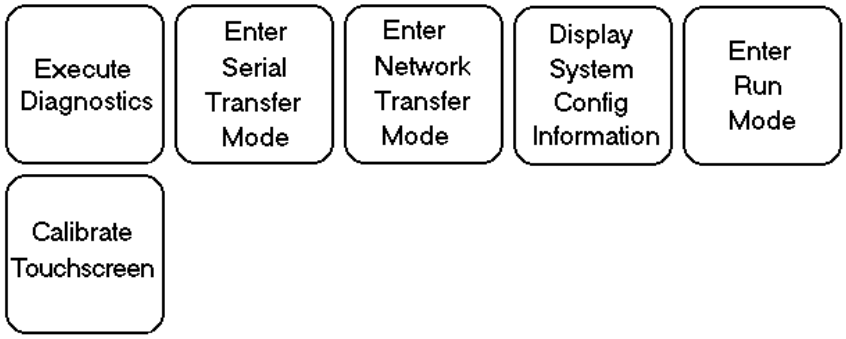


Figure 2-12 Offline Mode Menu

Note After the diagnostics are complete, you can force a keypad unit into Offline Mode by pressing the lower two control buttons simultaneously. To force a touchscreen unit into the Offline Mode, press the lower right control button.

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Execute Diagnostics

Select the template labeled "Execute Diagnostics" or use the TouchPanel mounted below the CRT on keypad units. Then press the control button labeled "Execute" to display a new page of choices.

Perform these tests by selecting the appropriate template then pressing the **Execute** control button:

- Set Date and Time
- Display
- Keypad
- Touchscreen
- Tone, Relay, 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, enter 2:45:11 PM as 14-45-11. Be sure to use the minus key between numeric values. Pressing the control button labeled "Enter" enters the new time.
   If the time is already correct, press the <Cancel> key to exit.
4. Press the <Cancel> key then the bottom control button labeled "Exit" to proceed.



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Perform Display Tests

Select Display Test and press the Execute control button. The new page displays four display tests you can run.

For PanelMate Grayscale units, the tests are:

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

For PanelMate units, the tests are:

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

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

Perform Keypad Test

Note This test only appears on keypad units.

Use this test to verify keyboard 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 because it exits the test mode.

Perform Touchscreen Test

Note This test only appears on touchscreen units.

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 because it exits the test mode.



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Check the Tone and Fault Relay, and Test the Battery

Select this template and press the control button labeled "Execute" to display six new test selections. If you have the optional Audio Feedback Kit, follow the onscreen instructions to test the Low, Medium, and High Audio Tones. You can also call screens to test the Fault Relay 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. Before removing your wiring, turn the power switch OFF, then disconnect the AC 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 remains in the ready state until the Configuration Software initiates the transfer. Configuration files, drivers, executive firmware, and options can be downloaded to the PanelMate unit. The PanelMate unit configuration file can be uploaded to a personal computer.

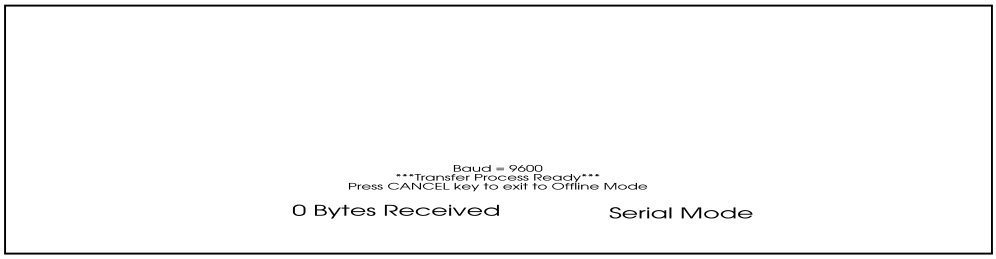


Figure 2-13 Serial Transfer Screen

Note that you can 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.

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PanelMate units are modular, so you can remove the electronics module and take it to your personal computer to transfer files. Serial Transfer Mode is the default state of the electronics module when the **front panel is removed** and **power is applied**.

Use the configuration software to change the default communication rate (9600 baud) in the PanelMate unit. The PanelMate unit uses port 1 for transferring information.

Enter the Network Transfer Mode

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

To download, upload, remotely place the PanelMate unit into Run Mode, or read system information over a remote network, the online unit must have the Remote Transfer option installed and be in the Network 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 a 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 Place VCP Unit in Run Mode topic in the Configuration Software Online Help.



Figure 2-14 Network Transfer Screen

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.

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Display System Configuration Information

This selection displays the PanelMate online unit's current configuration info.

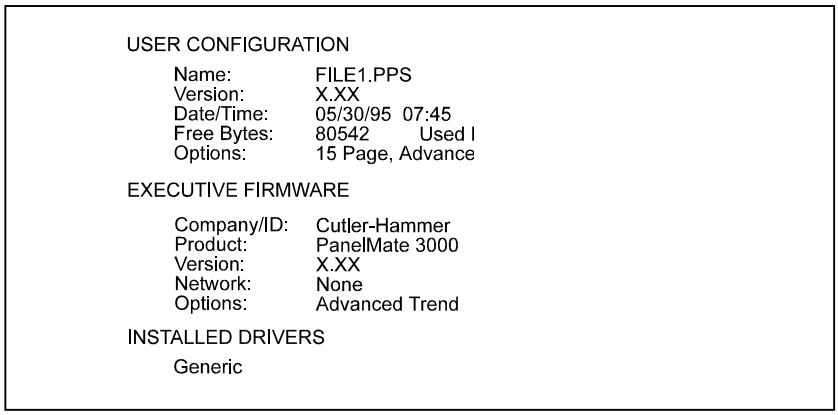


Figure 2-15 System Configuration Display

Enter Run Mode

Use this mode to display the configuration in the PanelMate unit communicating with the PLC of your choice. If the Remote Transfer option is installed, you can remotely place the PanelMate unit into Run Mode from a 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 can also remotely place the PanelMate unit into 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 Place VCP Unit in Transfer Mode topic in the Configuration Software Online Help.

Exit Run Mode

To exit the Run Mode:

1. Select "More" from the default control buttons
2. Select "Setup Page"
3. Select “Enter Offline Mode” from the Setup Page.

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Calibrate Touchscreen

Note This selection lets you calibrate your touchscreen in the Offline Mode. You can also calibrate in Run Mode. See *Calibrate Touchscreen* in Chapter 4. This template only appears on PanelMate touchscreen units.

PanelMate touchscreen units have a calibration routine that must be performed to determine the boundaries of the video on your touchscreen. When you select the Calibrate Touchscreen template and press the Execute control button, this screen appears.

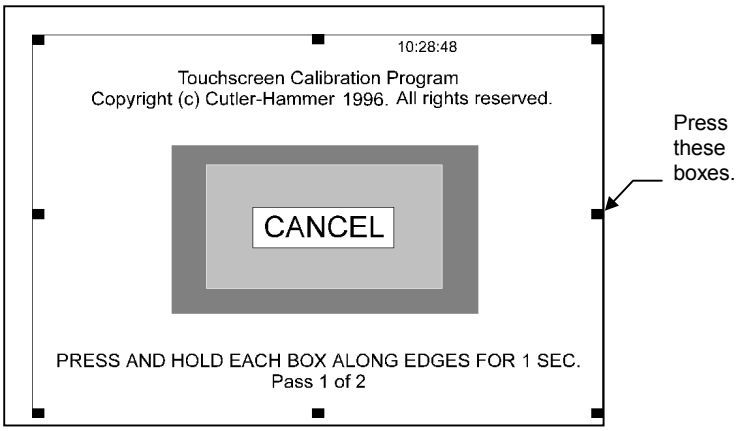


Figure 2-16 Calibration Screen

To calibrate, press each of the boxes around the outside of the page (Fig. 2-16) You may press the boxes in any order but all boxes must be pressed to complete the calibration.

Each box turns green (or different shade of gray) when pressed. After the first pass, the boxes turn red (the original shade) to indicate that the screen is ready for the second pass. After calibrating, you return to the Setup Page. Calibration settings are retained when power is removed from the PanelMate unit.

Calibrating In Run Mode

See *Calibrate Touchscreen* in Chapter 4 for more information.

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Installation in an Industrial Enclosure

3

In this chapter, you will learn:

- *How to install the PanelMate Unit in an industrial enclosure*
- *How to install the two-inch Mounting Collar*
- *How to connect AC Power*
- *How to connect a Printer to the PanelMate Unit*
- *How to connect to the Fault Relay*
- *How to connect to the Audio Output*
- *How to connect to the Security Keyswitch*



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PanelMate 2000 Grayscale Keypad Unit

The PanelMate 2000 Grayscale Keypad Unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate 2000 Grayscale Keypad Unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate 2000 Grayscale Keypad Unit Outline and the PanelMate 2000 Grayscale Keypad Unit Panel Cutout and Torque drawings shown 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

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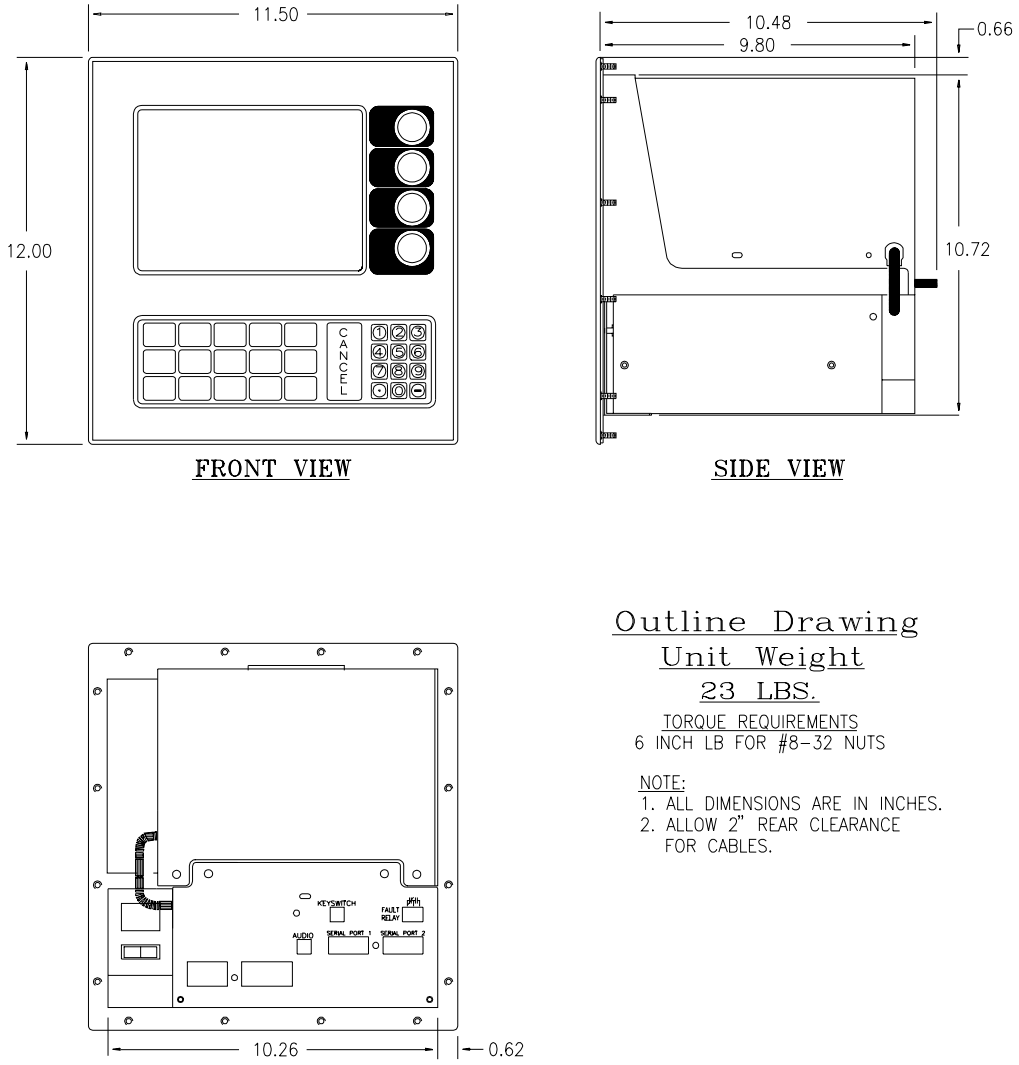
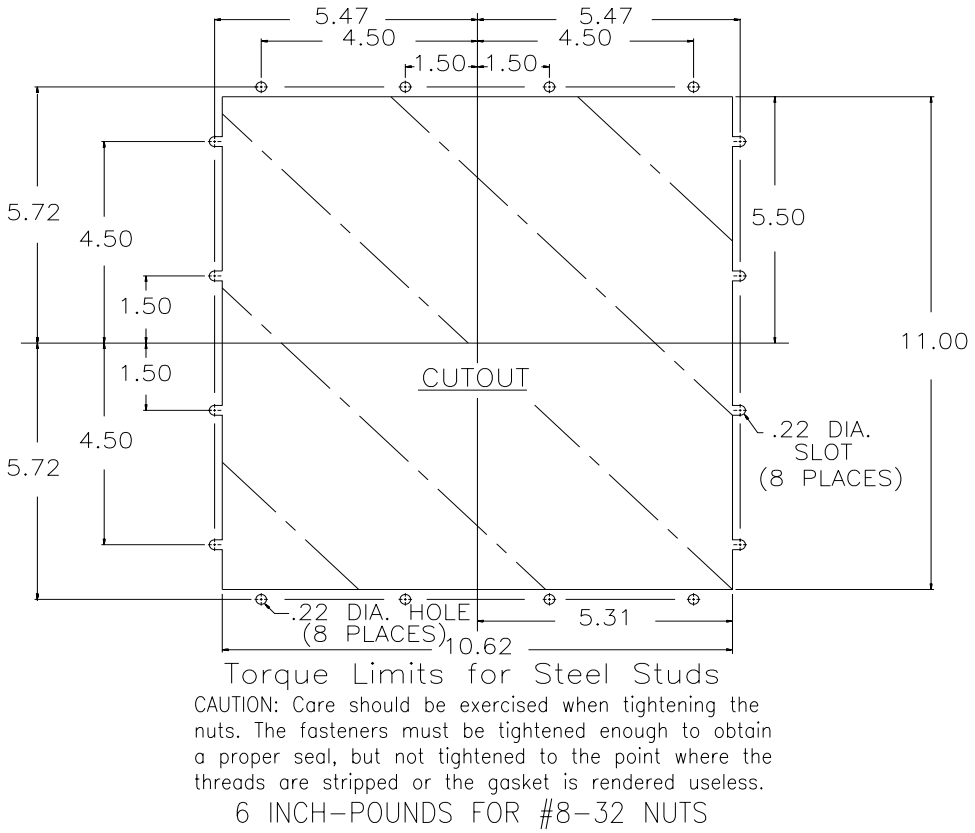


Figure 3-1 PanelMate 2000 Grayscale Keypad Unit Outline

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Note All units are in inches.

Figure 3-2 PanelMate 2000 Grayscale Keypad Unit Cutout and Torque Limits

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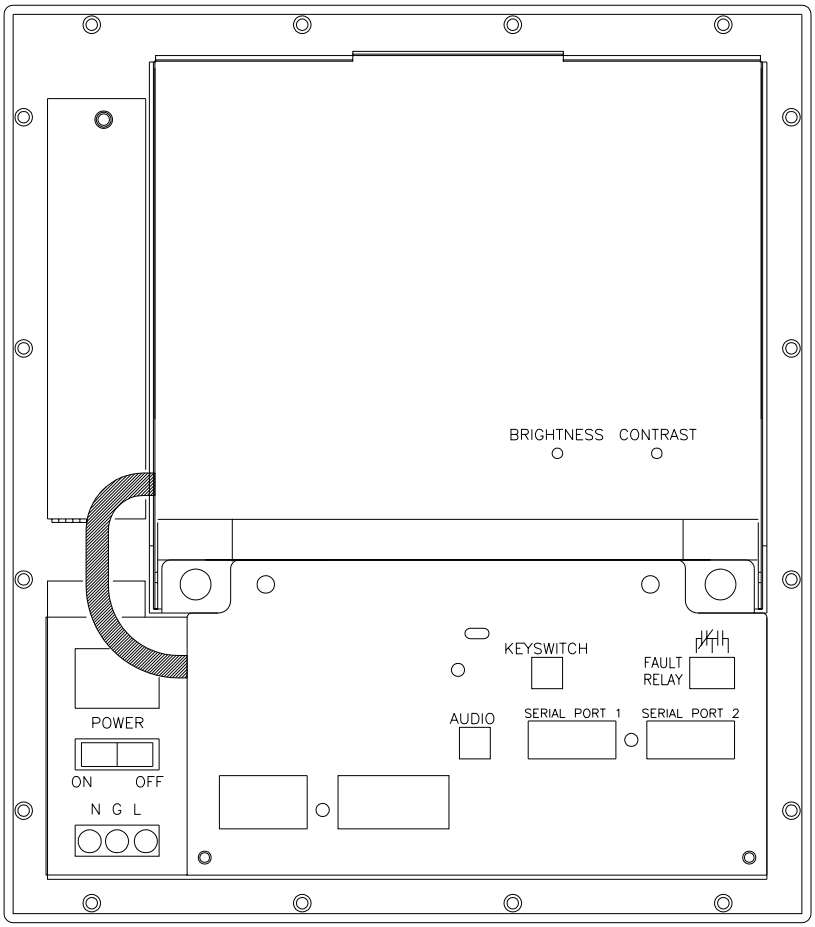


Figure 3-3 PanelMate 2000 Grayscale Keypad Unit Rear View

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Install in an Enclosure

Make cutouts in the enclosure as show in figure 3-2. Disassemble the PanelMate Unit using the following procedure:

1. Go to the back of the unit. Remove AC power and disconnect any other cables.
2. Unplug the Monitor Module video/power cable from the Electronics Module. This cable disconnects power and the video signal to the monitor.
3. Remove the Monitor Module. Do this by turning the quarter-turn fasteners counter-clockwise. The Monitor Module is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module. Do this by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to dis-engage the front panel keypad connector. Then pivot the assembly down to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

   Caution Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.
6. Re-attach the Electronics Module. Do this by engaging the front slots of the Electronics Module on the mounting flange on the Front Panel. Bring the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Module. Slide the Monitor Module into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video/power cable from the Monitor Module to the Electronics Module.
8. You may now re-connect AC power and cables to the Monitor and Electronics Modules.



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Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate 2000 Grayscale Keypad Unit and allows mounting a unit into a 10-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 3-6. Check to see if the mounting collar will fit, then remove. Attach the PanelMate Unit to the mounting collar with the 16 nuts and washers provided with the PanelMate 2000 Grayscale Keypad Unit Mounting Collar Kit.

Caution *Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 8 inch-pounds.*

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 16 nuts and washers. Mount the PanelMate Unit's front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Module and Electronics Module.

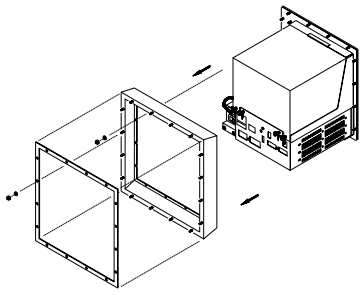


Figure 3-4 PanelMate 2000 Grayscale Keypad Unit (Model 2600) Mounting Collar Assembly

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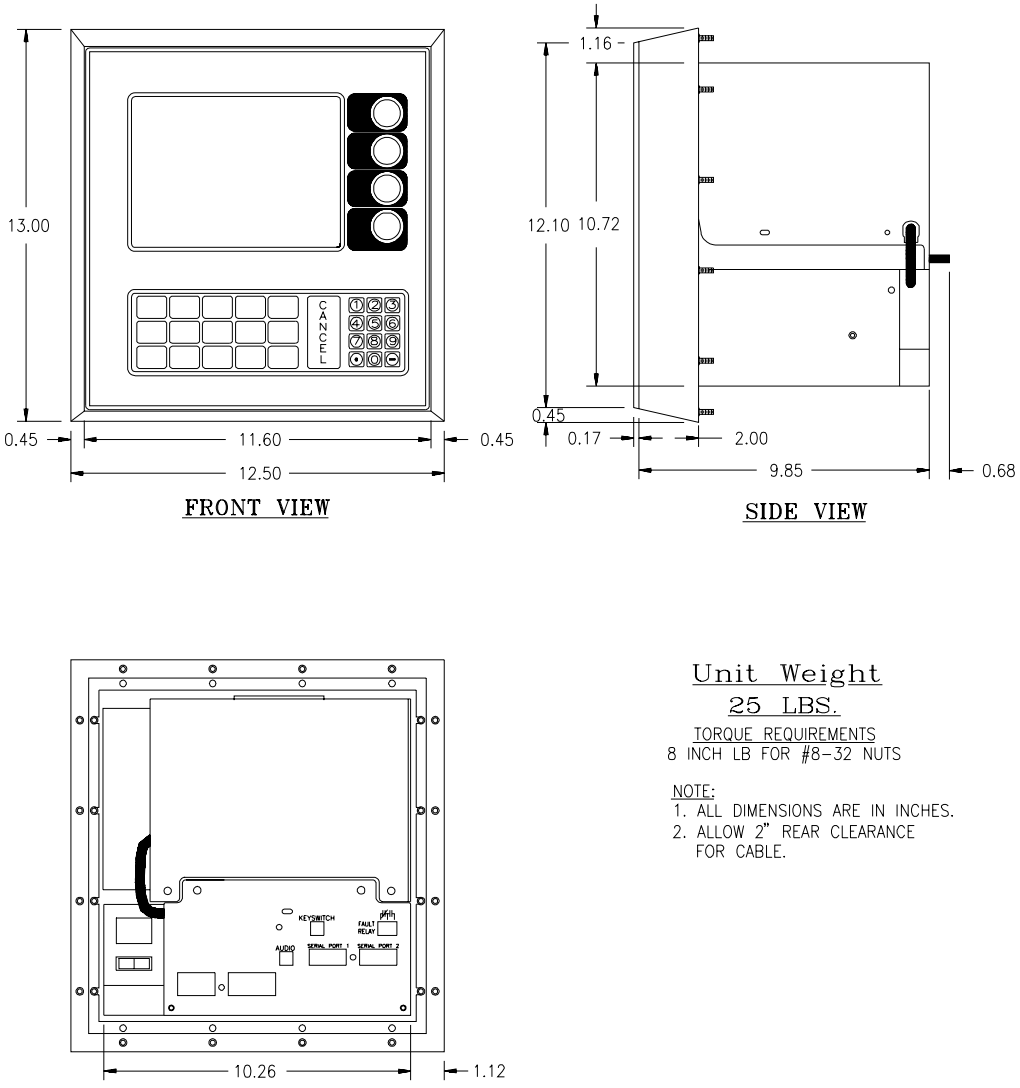
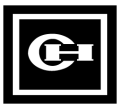
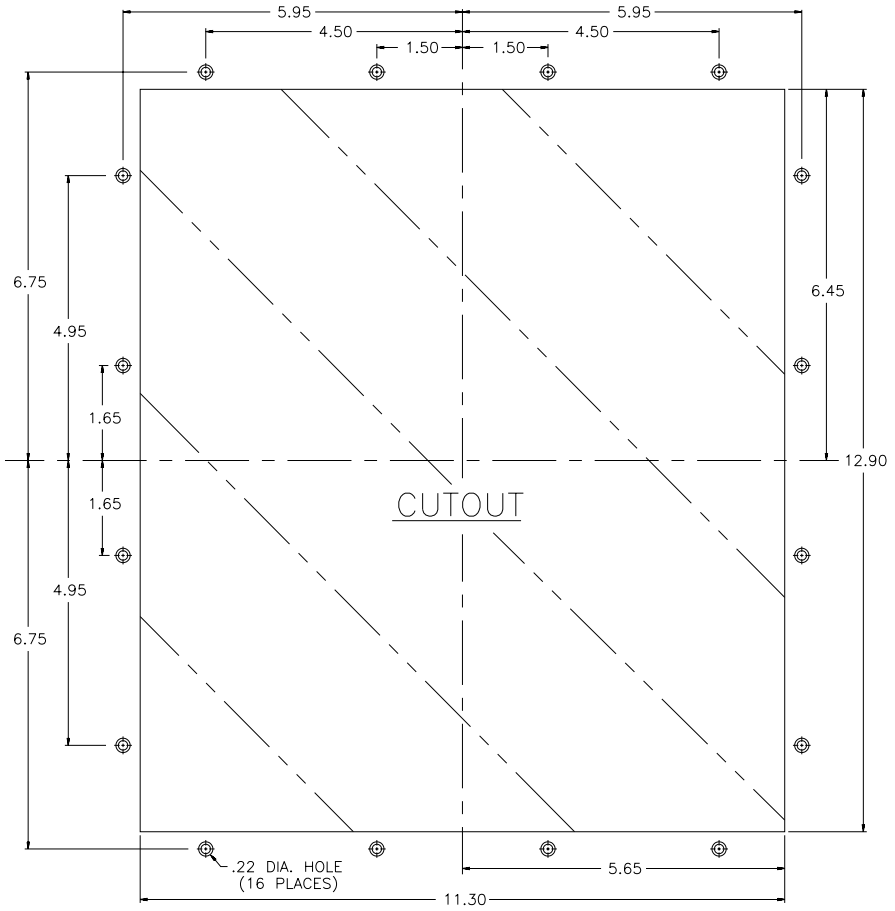


Figure 3-5 PanelMate 2000 Grayscale Keypad Unit (Model 2600) With Collar Outline

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CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

8 INCH-POUNDS FOR #8-32 NUTS

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Figure 3-6 PanelMate 2000 Grayscale Keypad Unit (Model 2600) Panel Mount Collar

PanelMate 2000 Color Keypad Unit (Model 2700)

The PanelMate 2000 Color Keypad Unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate 2000 Color Keypad Unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate 2000 Color Keypad Unit Outline and the PanelMate 2000 Color Keypad Unit Panel Cutout and Torque drawings shown 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

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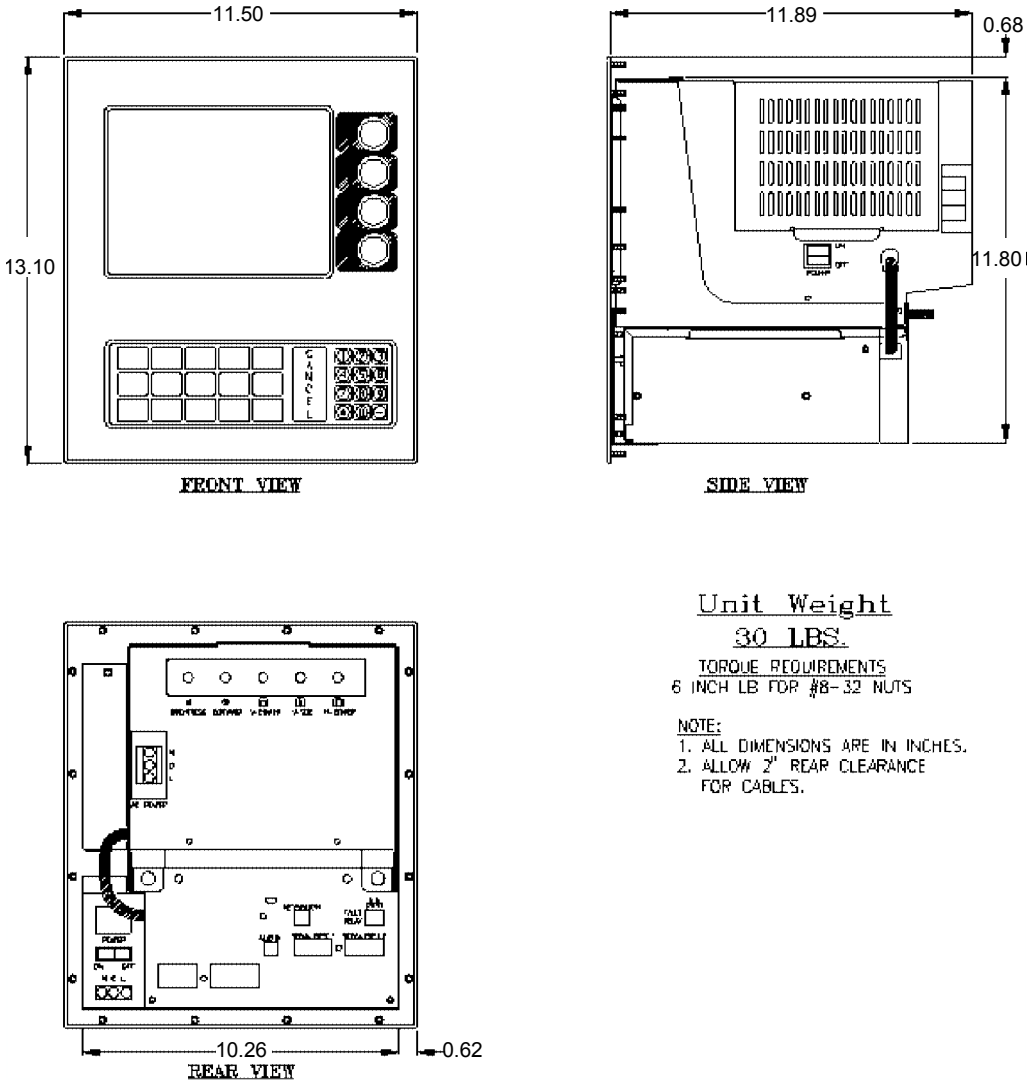
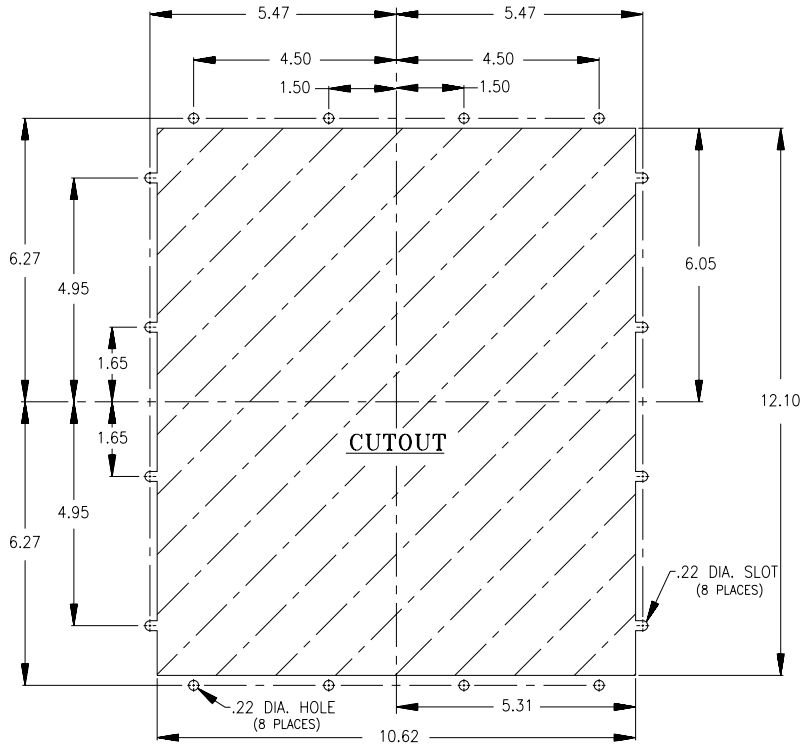


Figure 3-1 PanelMate 2000 Color Keypad Unit (Model 2700) Outline

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CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

6 INCH–POUNDS FOR #8–32 NUTS

Note All units are in inches.

Figure 3-2 PanelMate 2000 Color Keypad Unit (Model 2700) Cutout and Torque Limits

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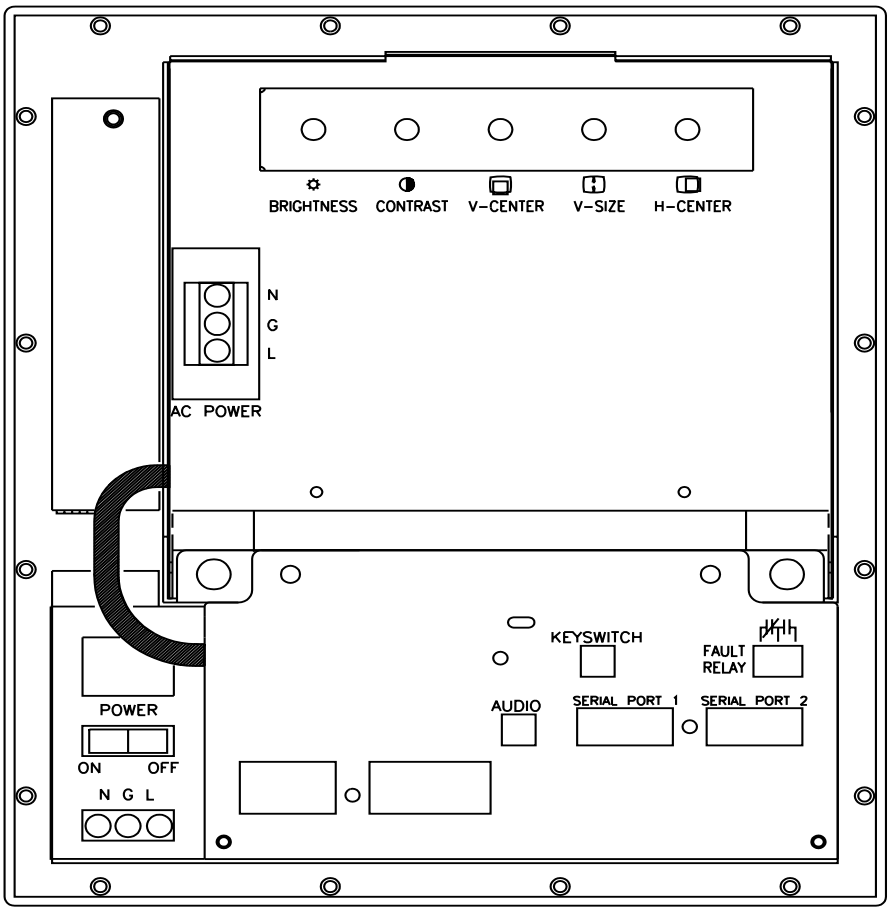


Figure 3-3 PanelMate Power Series 2000 Color Keypad Unit (Model 2700) Rear View

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Install in an Enclosure

Make cutouts in the enclosure as shown in figure 3-8. Disassemble the PanelMate Power Series unit using the following procedure:

1. Go to the back of the unit. Remove AC power from both the Electronics Module and the monitor housing.
2. Unplug the Monitor Module video cable from the Electronics Module. This cable disconnects the video signal to the monitor.
3. Remove the Monitor Module. Do this by turning the quarter-turn fasteners counter-clockwise. The Monitor Module is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module. Do this by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly away from the front panel to disengage the front panel keypad connector. Then pivot the assembly down to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

6. Re-attach the Electronics Module. Do this by engaging the front slots of the Electronics Module on the mounting flange on the Front Panel. Bring the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Module. Slide the Monitor Module into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable to both the Electronics Module and the monitor housing.
8. You may now re-connect AC power and cables to the Monitor and Electronics Modules.



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Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Power Series 2000 Color Keypad unit and allows mounting a unit into a 10-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutouts for the mounting collar as shown in figure 3-12. Check to see if the mounting collar will fit, then remove. Attach the PanelMate Power Series unit to the mounting collar with the 16 nuts and washers provided with the PanelMate Power Series 2000 Color Mounting Collar Kit.

Caution

Use care when tightening the nuts. They must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 8 inch-pounds.

Attach the gasket to the mounting collar. Place the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten it to the panel with 16 nuts and washers. Mount the PanelMate Power Series unit's front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Module and Electronics Module.

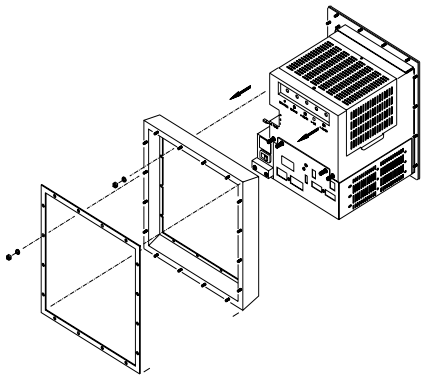


Figure 3-4 PanelMate Power Series 2000 Color Keypad Unit (Model 2700) Mounting Collar Assembly

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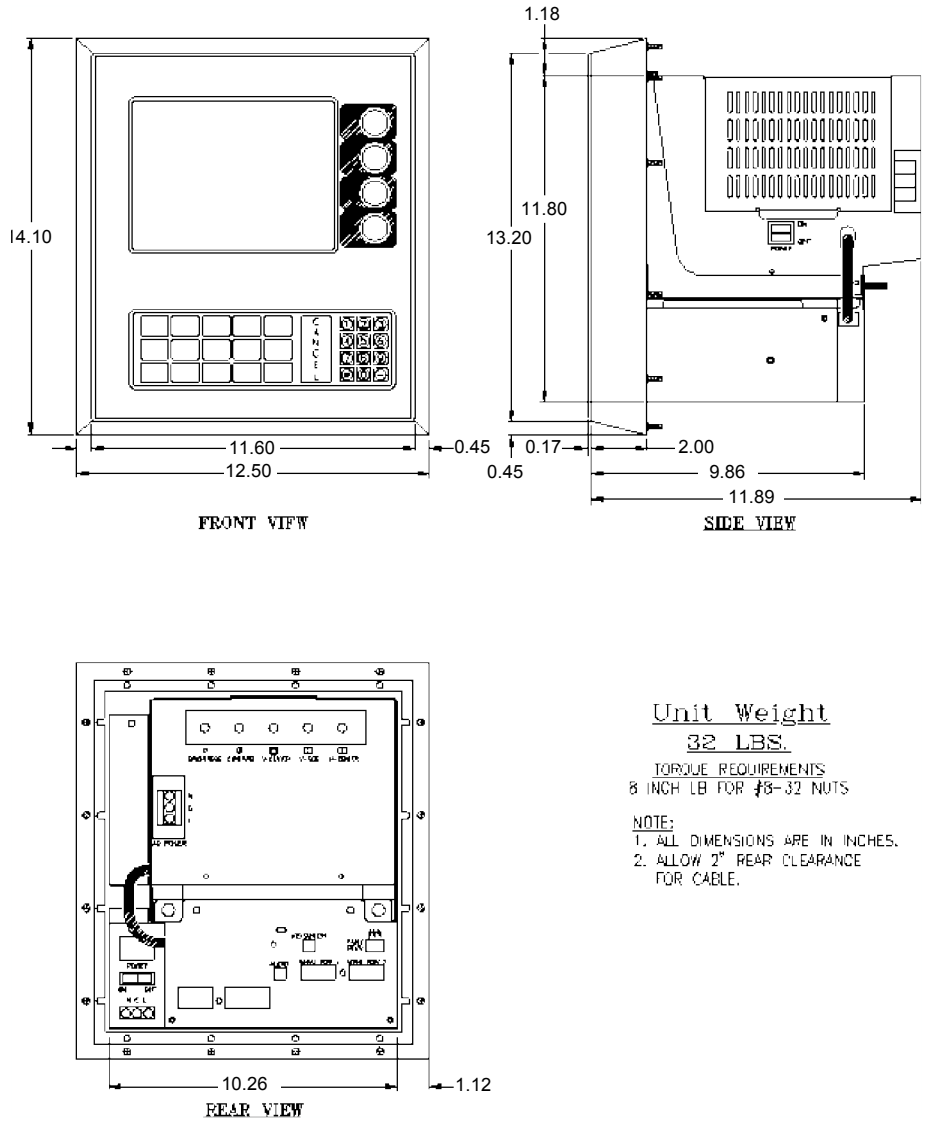
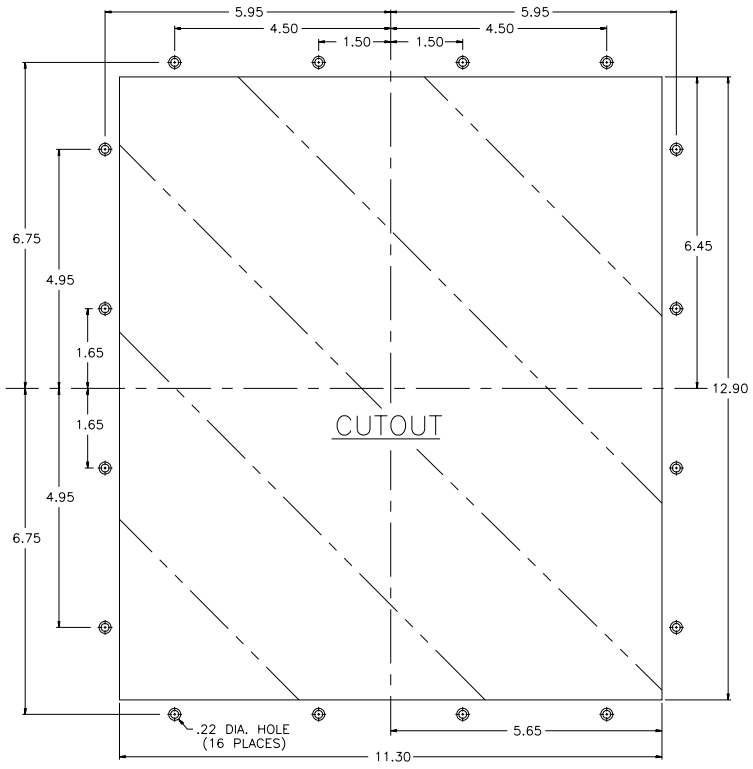


Figure 3-5 PanelMate Power Series 2000 Color Keypad Unit (Model 2700) with Collar Outline

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Note *All units are in inches.*

Figure 3-6 PanelMate Power Series 2000 Color Keypad Unit (Model 2700) Panel Mount Collar

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PanelMate Power Series 3000 Keypad Unit (Models 3600, 3700, and 3900)

The PanelMate Power Series 3000 Keypad unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 3000 Keypad unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 3000 Keypad unit Outline and the PanelMate Power Series 3000 Keypad unit Panel Cutout and Torque drawings shown 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 Power Series 3000 Keypad 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.



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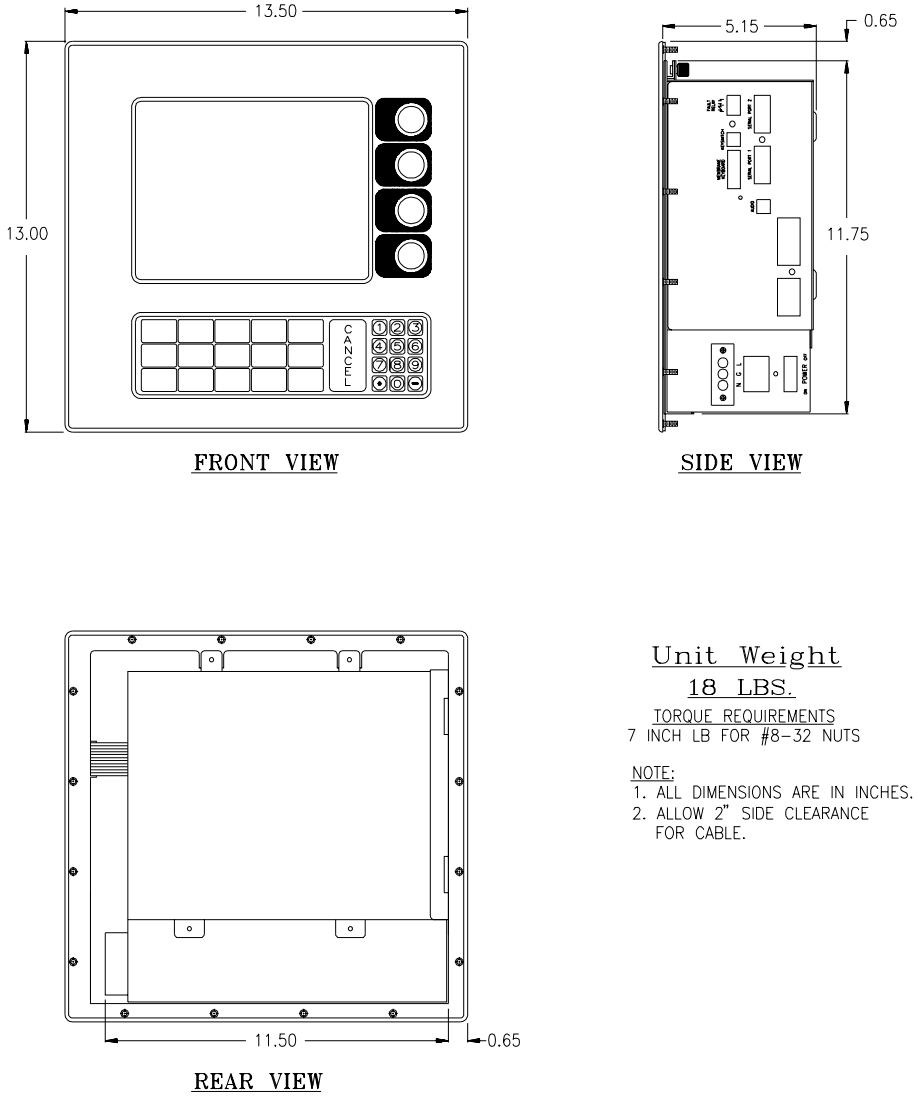
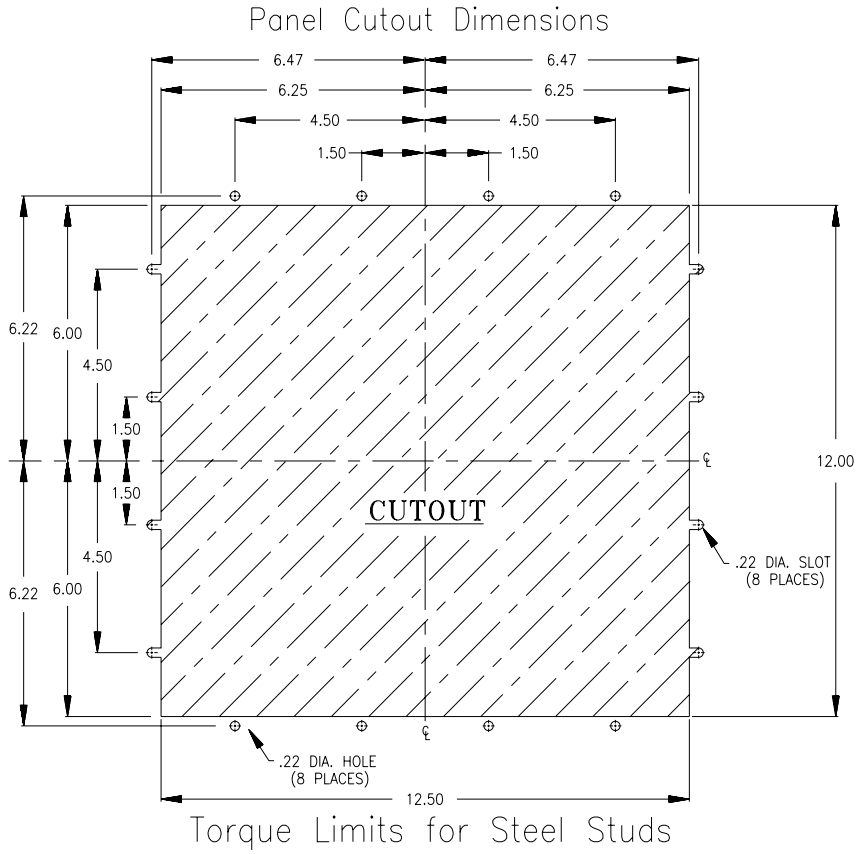


Figure 3-7 PanelMate Power Series 3000 Keypad Unit (Models 3600, 3700, and 3900) Outline

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Note *All units are in inches.*

Figure 3-8 PanelMate Power Series 3000 Keypad Unit (Models 3600, 3700, and 3900) Cutout and Torque Limits

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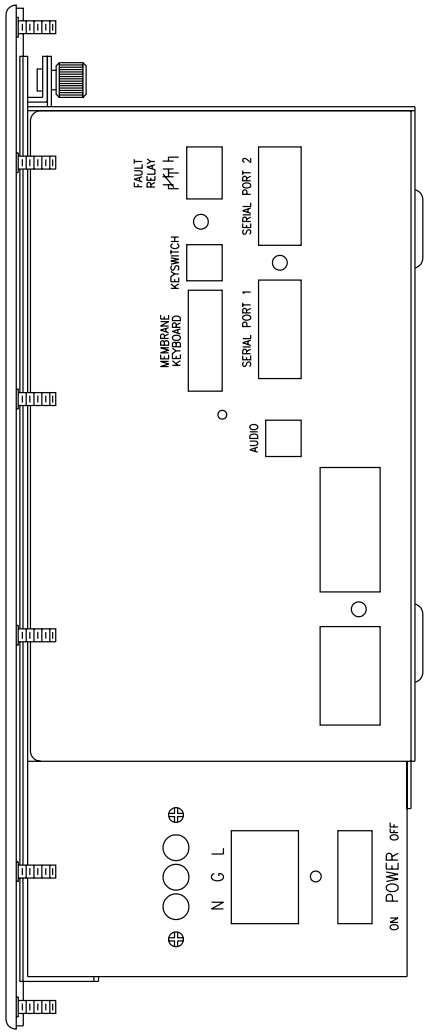


Figure 3-9 PanelMate Power Series 3000 Keypad Unit (Models 3600, 3700, and 3900) Side View

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Install in an Enclosure

Make the cutouts in the enclosure as shown in figure 3-14. Disassemble the PanelMate Power Series 3000 Keypad unit using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other cables.
2. Unplug the keypad cable from the Electronics Module. Make sure you do not pull on the keypad cable.
3. Unfasten the ferrite block from the unit. Make sure the free weight of the ferrite does not damage the keypad cable.
4. Remove the Electronics Display Assembly. Do this by turning the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 7 inch-pounds.

6. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
7. Plug the connector into the Electronics Module. Make sure you do not press on the keypad cable.
8. You may now re-connect AC power and cables.



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PanelMate Power Series 4000 Keypad Unit (Model 4200-Split Architecture)

The PanelMate Power Series 4000 (Split Architecture) Keypad unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 4000 (Split-Architecture) Keypad unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 4000 (Split Architecture) Keypad unit Outline and the PanelMate Power Series 4000 (Split Architecture) Keypad unit Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. If the PanelMate Power Series 4000 (Split Architecture) Keypad unit will be used in a PanelMate Series I, II, or III enclosure, the cutout will have to be modified as shown in figure 3-18. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate Power Series 4000 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

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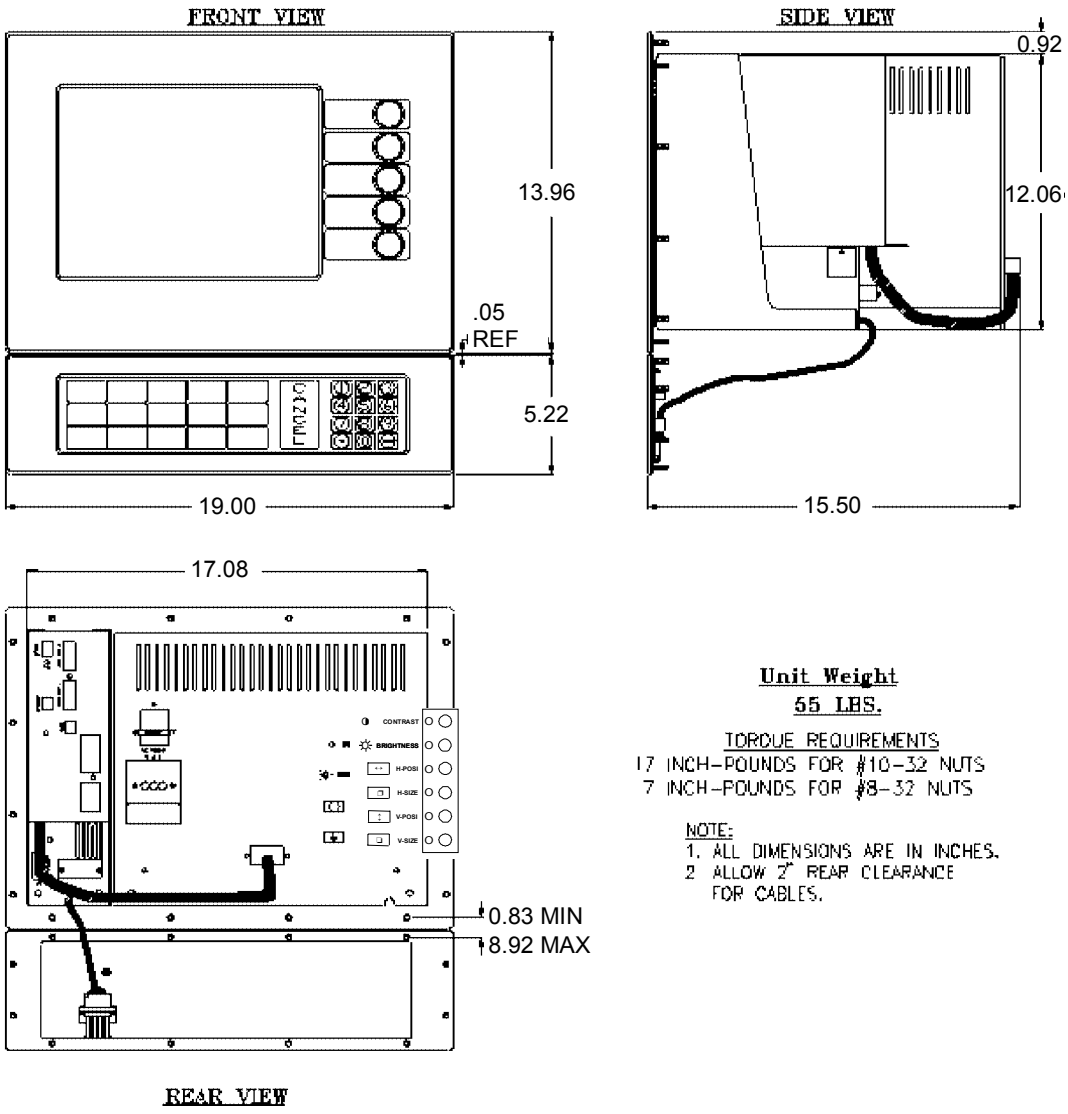
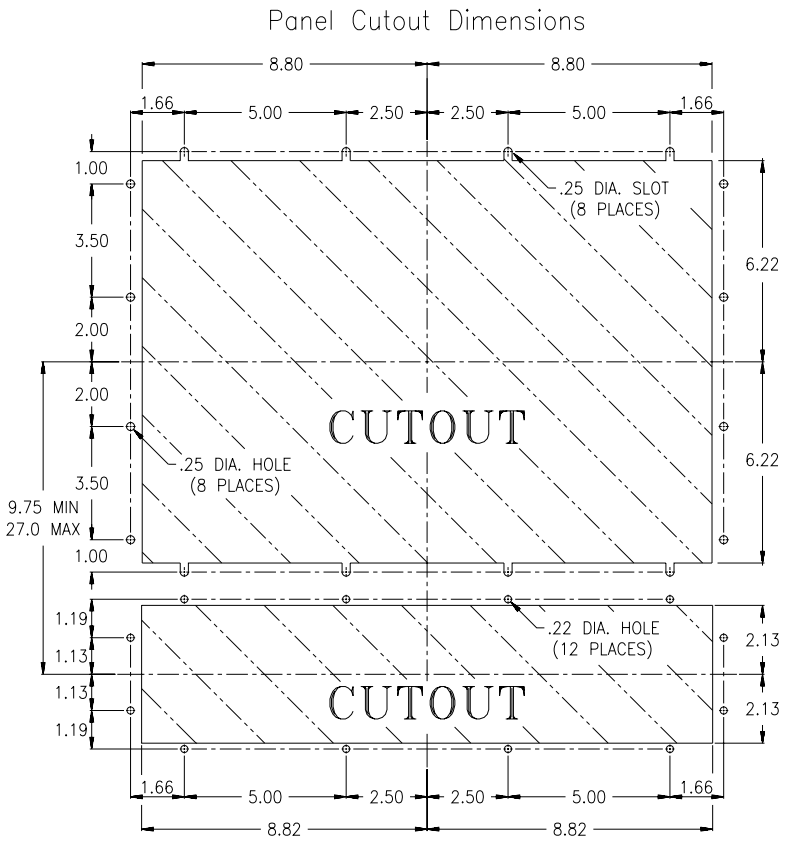


Figure 3-10 PanelMate Power Series 4000 Keypad Unit (Model 4200-Split Architecture) Outline

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CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. The following torque limits should not be exceeded.

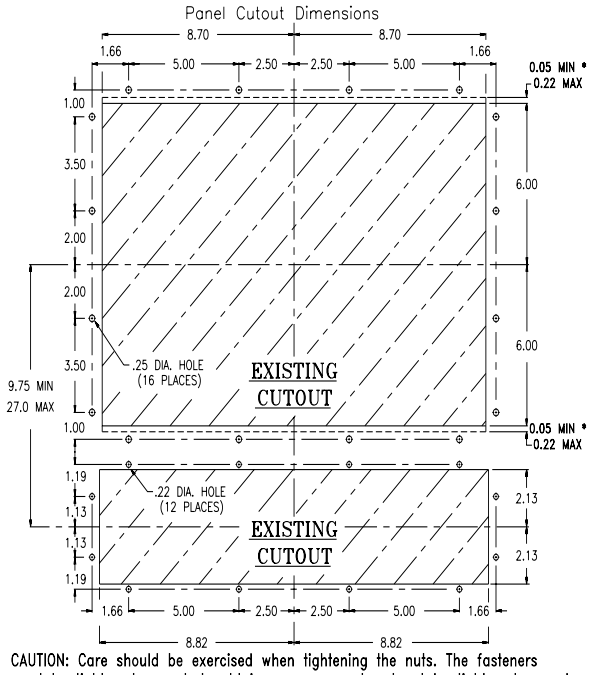
17 INCH–POUNDS FOR #10–32 NUTS
7 INCH–POUNDS FOR #8–32 NUTS

Note *All units are in inches.*

Figure 3-11 PanelMate Power Series 4000 Keypad Unit (Model 4200 -Split Architecture) Cutout and Torque Limits

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To place a PanelMate Power Series 4000 Keypad unit in a PanelMate Series 2900 cutout, use the following cutout figure.



CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. The following torque limits should not be exceeded.

17 INCH-POUNDS FOR #10-32 NUTS

7 INCH-POUNDS FOR #8-32 NUTS

Note *All units are in inches.*

Figure 3-12 PanelMate Power Series 4000 Keypad Unit (Model 4200 - Split Architecture) Cutout and Torque Limits for a PanelMate Series I, II, or III Cutout

Note *To retrofit a PanelMate Power Series Keypad unit into an existing PanelMateSeries I, II, or III cutout, the cutout may need to be modified. If the existing cutout was made to the minimum dimensions for a PanelMate Series I, II, or III, then at least 0.050 inches should be removed from the front panel assembly before mounting the unit in the cutout. If the maximum of 0.22 inches is removed, the unit can be mounted without disassembly.*

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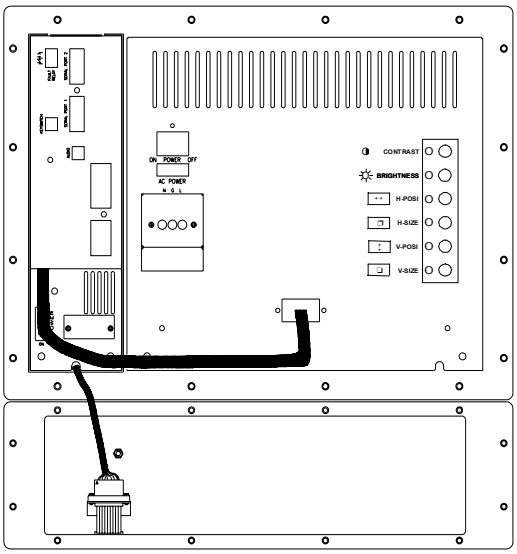


Figure 3-13 PanelMate Power Series 4000 Keypad Unit (Model 4200 - Split Architecture) Rear View

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Install in an Enclosure

Make the cutout in the enclosure as shown in figure 3-17. Disassemble the PanelMate Power Series 4000 Keypad unit using the following procedure:

1. At the back of the unit, remove AC power from the Electronics Module and the monitor. Disconnect any other cables.
2. Unplug the Monitor Module video cable from the Electronics Module. This cable disconnects the video signal to the monitor.
3. Remove the Monitor Module by turning the quarter-turn fasteners counter-clockwise. The Monitor Module is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to disengage the front panel keypad connector. Then pivot the assembly to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the eighteen #10 washers and nuts that are supplied with the unit.

Caution

Exercise care when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 17 inch-pounds.

6. Re-attach the Electronics Module by engaging the front slots of the Electronics Module on the mounting flange on the Front Panel. Raise the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Module. Slide the Monitor Module into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable from the Monitor Module to the Electronics Module.
8. From the front, insert the keypad in the cutout and fasten it with the twelve #8 washers and nuts supplied with the unit.
9. You may now re-connect AC power to both the Monitor and Electronics Modules.



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Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Power Series 4000 Keypad unit. It allows mounting a unit into a 16-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 3-22. Check to see if the mounting collar will fit, then remove. Attach the unit to the mounting collar with the 22 nuts and washers provided with the PanelMate Power Series 4000 (Split Architecture) Keypad unit Mounting Collar Kit.

Caution

Exercise care when tightening the nuts. They must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 17 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time. Insert the assembled collar in the panel and fasten the collar to the panel with 22 nuts and washers. Then, mount the front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Module and Electronics Module.

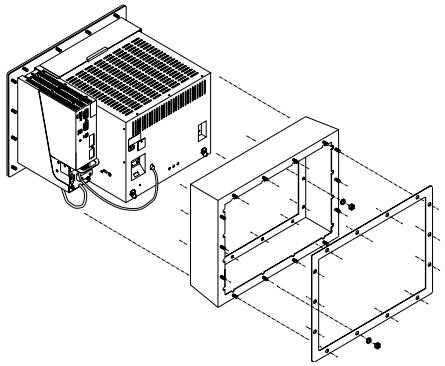


Figure 3-14 PanelMate Power Series 4000 Keypad Unit (Model 4200-Split Architecture) Mounting Collar Assembly

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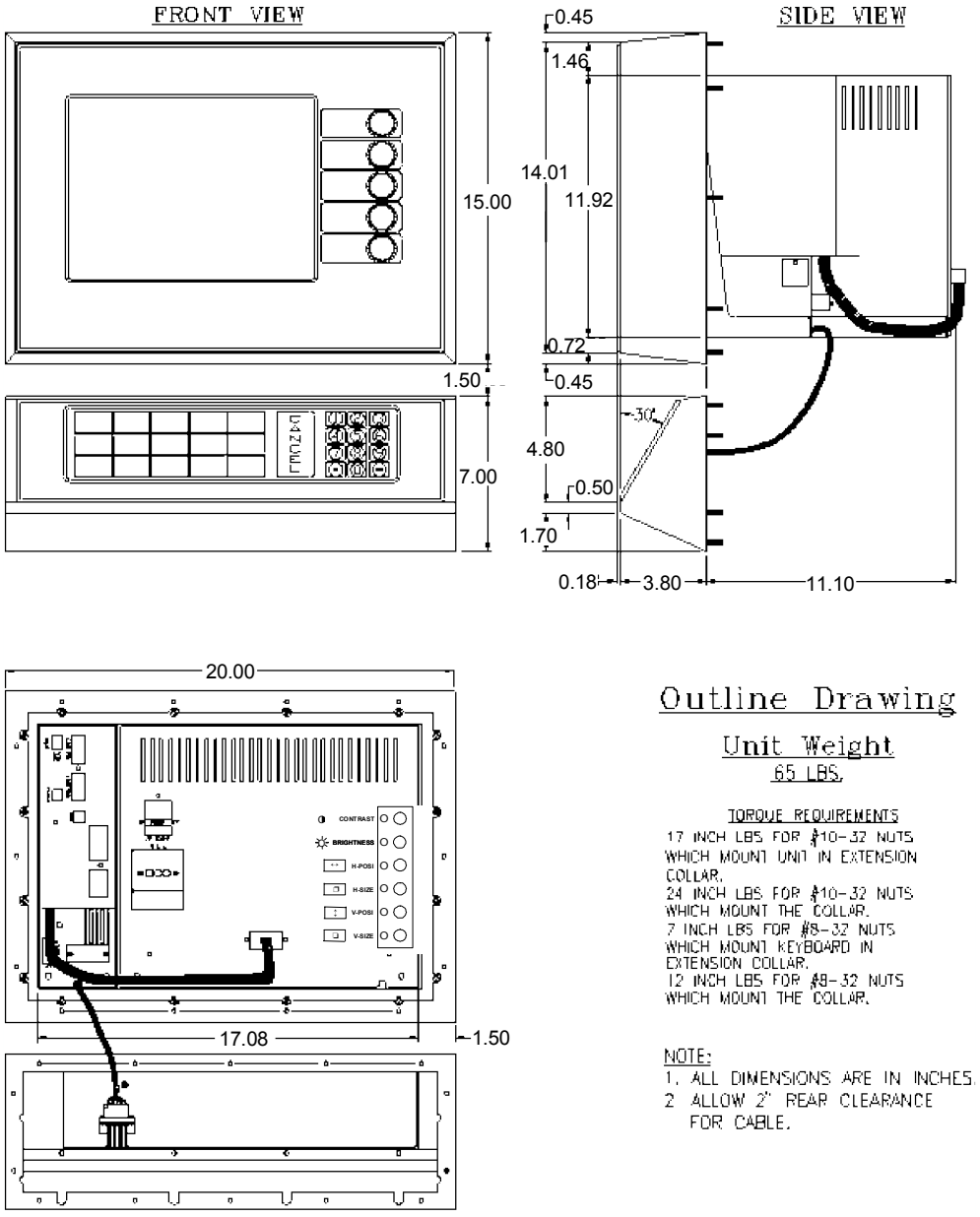
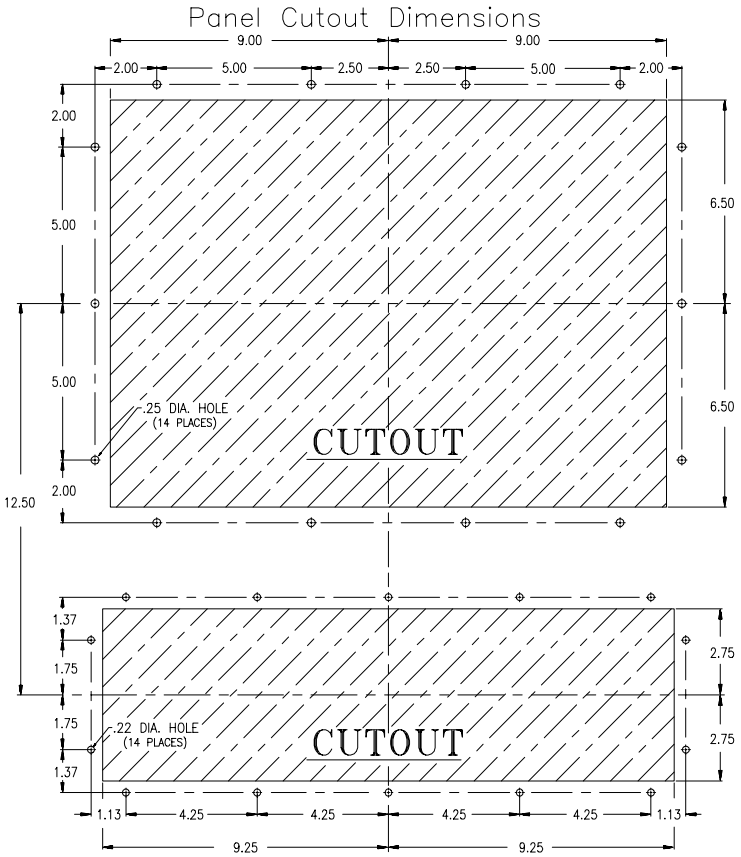


Figure 3-15 PanelMate Power Series 4000 Keypad Unit (Model 4200-Split Architecture) With Collar Outline

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CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. The following torque limits should not be exceeded.

24 INCH–POUNDS FOR #10–32 NUTS
12 INCH POUNDS FOR #8–32 NUTS

Note All units are in inches.

Figure 3-16 PanelMate Power Series 4000 Keypad Unit (Model 4200-Split Architecture) Panel Mount Collar

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PanelMate Power Series 4000 Keypad Unit (Model 4500)

The PanelMate Power Series 4000 Keypad unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 4000 Keypad unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 4000 Keypad unit Outline and the PanelMate Power Series 4000 Keypad unit Panel Cutout and Torque drawings shown 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 Power Series 4000 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.



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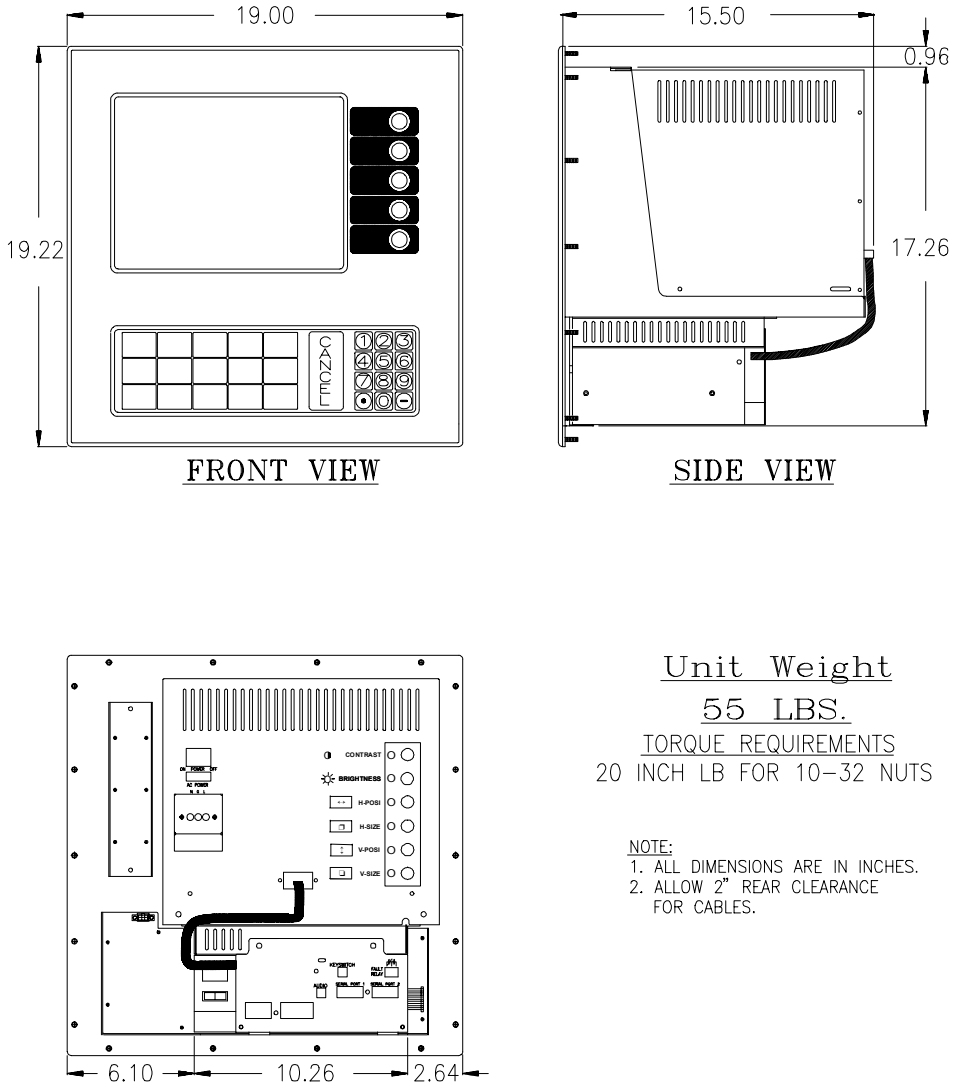
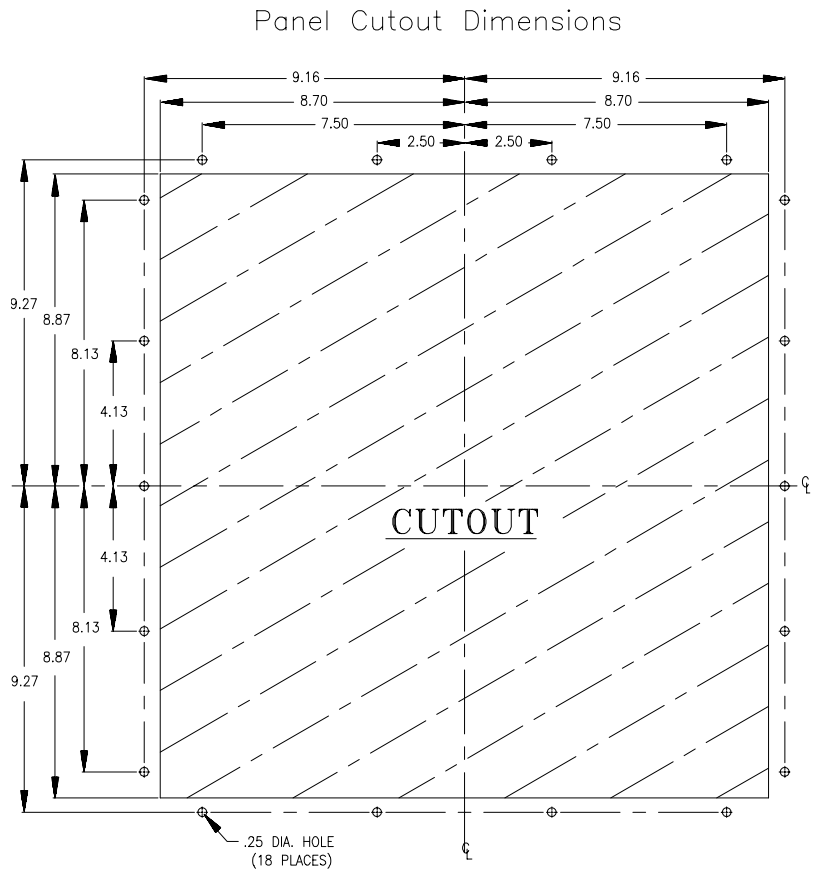


Figure 3-17 PanelMate Power Series 4000 Keypad Unit (Model 4500) Outline

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Note *All units are in inches.*

Figure 3-18 PanelMate Power Series 4000 Keypad Unit (Model 4500) Cutout and Torque Limits

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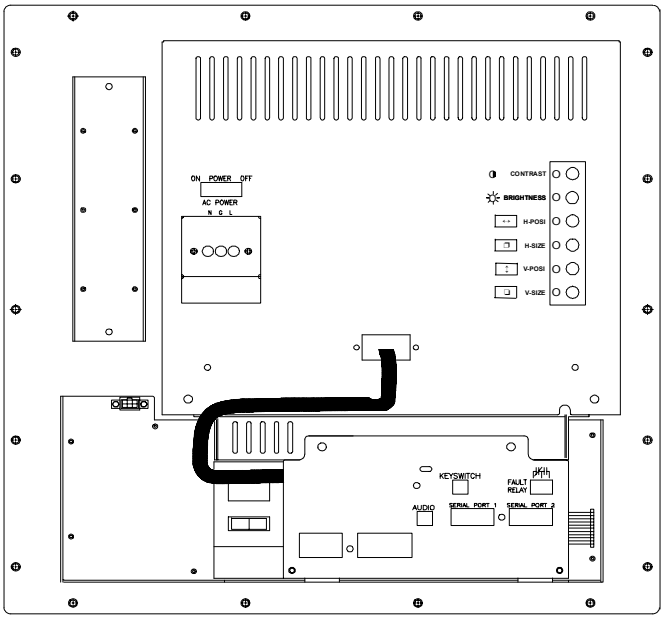


Figure 3-19 PanelMate Power Series 4000 Keypad Unit (Model 4500) Rear View

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Install in an Enclosure

Make the cutout in the enclosure as shown in figure 3-24. Disassemble the PanelMate Power Series 4000 Keypad unit using the following procedure:

1. Go to the back of the unit. Remove AC power from both the Electronics Module and the monitor. Disconnect any other cables.
2. Unplug the Monitor Module video cable from the Electronics Module. This cable disconnects the video signal to the monitor.
3. Remove the Monitor Module. Do this by turning the quarter-turn fasteners counter-clockwise. The Monitor Module is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module. Do this by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to disengage the front panel keypad connector. Then pivot the assembly to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the eighteen #10 washers and nuts that are supplied with the unit.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 20 inch-pounds.

6. Re-attach the Electronics Module. Do this by engaging the front slots of the Electronics Module on the mounting flange on the Front Panel. Raise the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Module. Slide the Monitor Module into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable from the Monitor Module to the Electronics Module.
8. You may now re-connect AC power to both the Monitor and Electronics Modules.



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Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Power Series 4000 Keypad unit. It allows mounting a unit into a 16-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 3-28. Check to see if the mounting collar will fit, then remove. Attach the unit to the mounting collar with the 22 nuts and washers provided with the PanelMate Power Series 4000 Keypad unit Mounting Collar Kit.

Caution

Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 20 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time . Insert the assembled collar in the panel and fasten the collar to the panel with 22 nuts and washers. Mount the front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Module and Electronics Module.

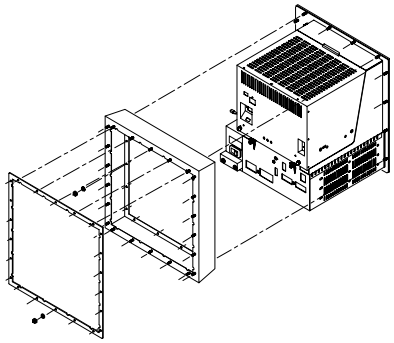


Figure 3-20 PanelMate Power Series 4000 Keypad Unit (Model 4500) Mounting Collar Assembly

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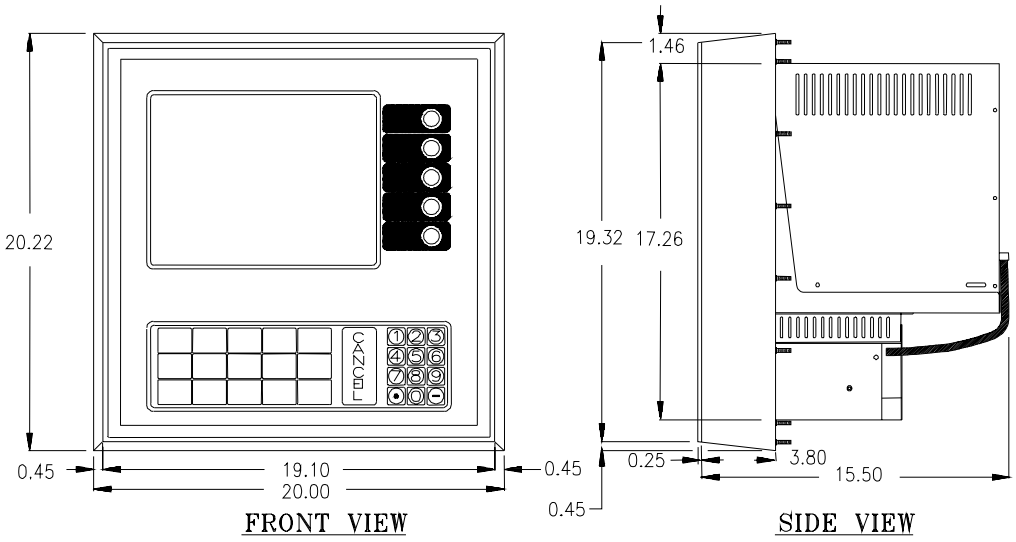
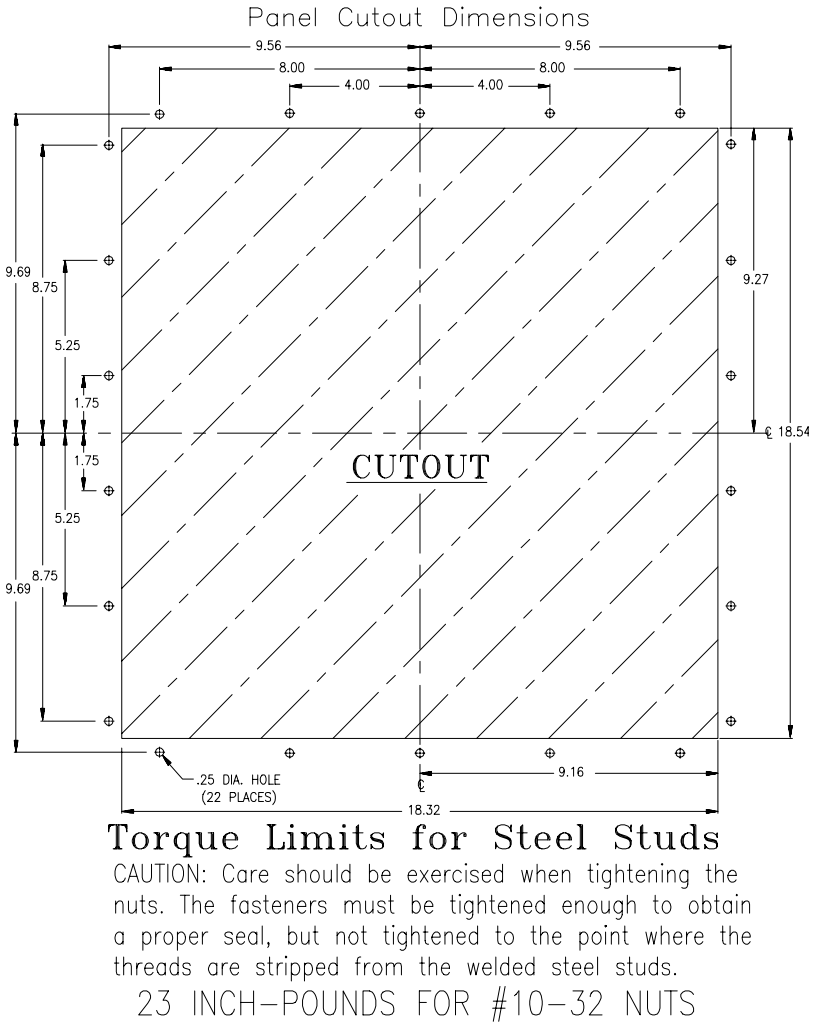


Figure 3-21 PanelMate Power Series 4000 Keypad Unit (Model 4500) with Collar Outline

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Note *All units are in inches.*

Figure 3-22 PanelMate Power Series 4000 Keypad Unit (Model 4500) Panel Mount Collar

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PanelMate Power Series 5000 Keypad Unit (Model 5200-Split Architecture)

The PanelMate Power Series 5000 Keypad unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 5000 Keypad unit in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 5000 Keypad unit Outline and Panel Cutout and Torque drawings shown 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 Power Series 5000 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.

In order to ensure proper convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.



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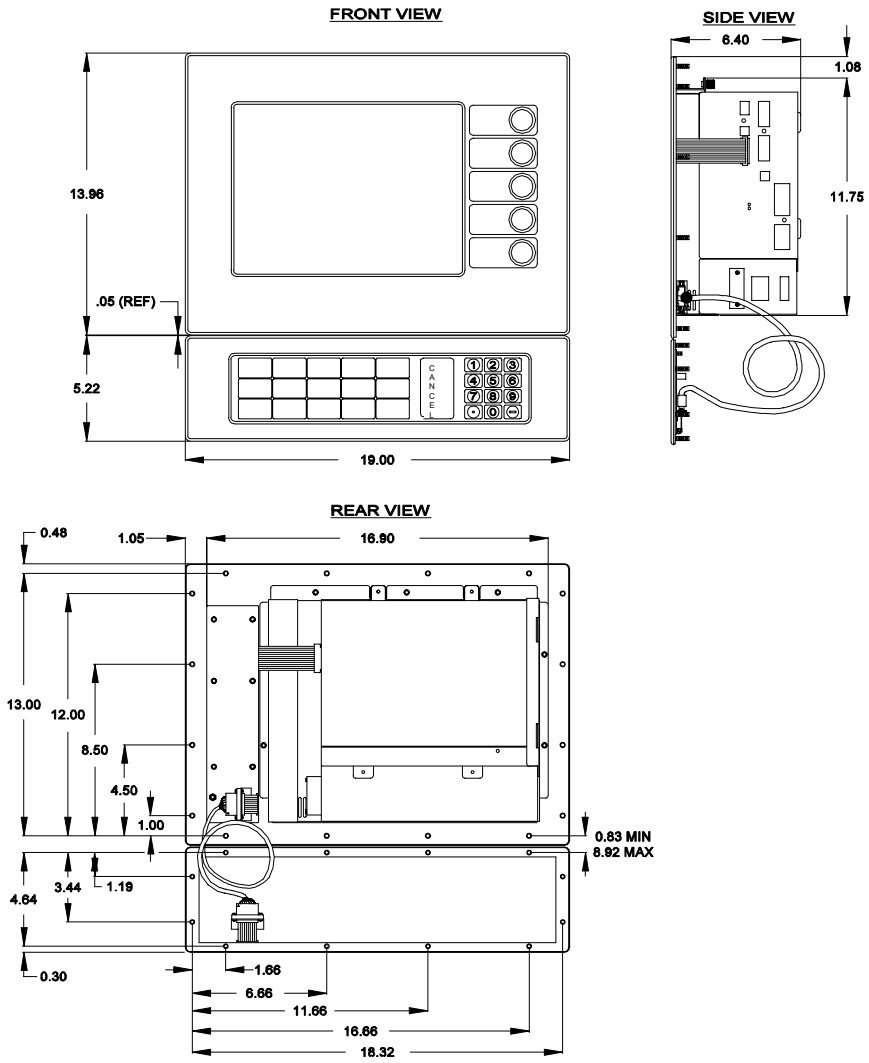
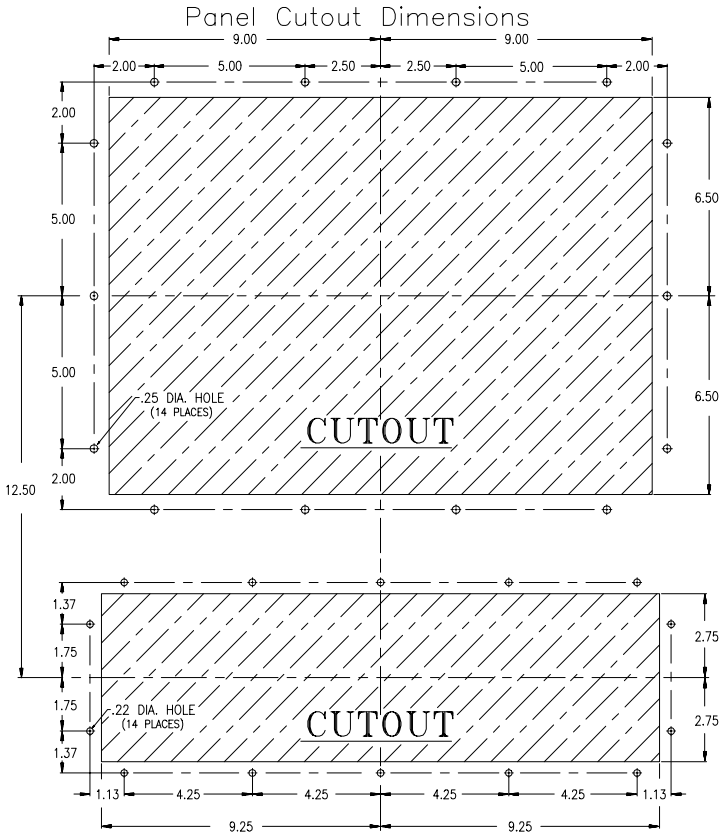


Figure 3-23 PanelMate Power Series 5000 Keypad Unit (Model 5200-Split Architecture) Outline

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CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. The following torque limits should not be exceeded.

24 INCH–POUNDS FOR #10–32 NUTS
12 INCH POUNDS FOR #8–32 NUTS

Figure 3-24 PanelMate Power Series 5000 Keypad Unit (Model 5200-Split Architecture) Cutout and Torque Limits

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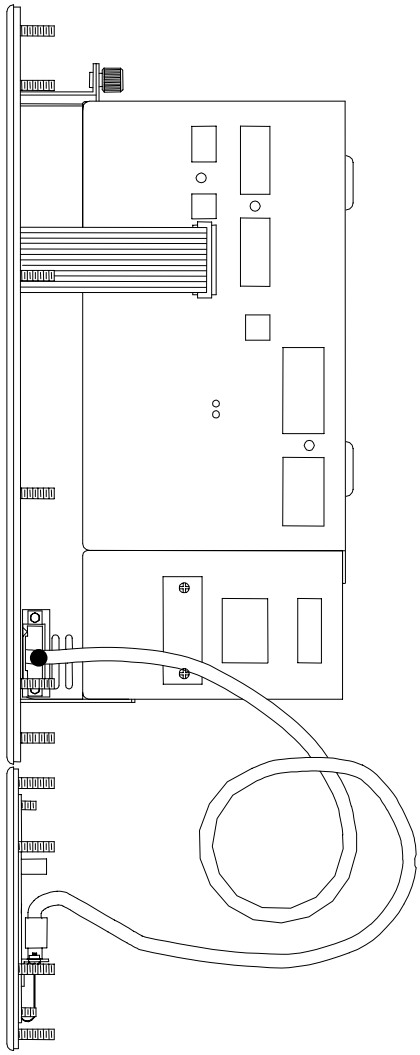


Figure 3-25 PanelMate Power Series 5000 Keypad Unit (Model 5200-Split Architecture) Side View

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Install in an Enclosure

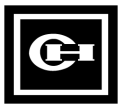
Make the cutout in the enclosure as shown in figure 3-30. Disassemble the PanelMate Power Series 5000 Keypad unit using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other cables.
2. Unplug the keypad connector from the Electronics Module. Make sure that you do not pull on the keypad cable.
3. Remove the Electronics Display Assembly, turn the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
4. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #10 washers and nuts that are supplied with the unit. Make sure the cable does not get pinched between the enclosure and the Front Panel.

Caution

Be careful when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 17 inch-pounds.

5. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
6. Plug the keypad connector into the Electronics Module. Make sure you do not press on the keypad cable.
7. You may now re-connect AC power and cables.



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PanelMate Power Series 5000 Keypad Unit (Model 5500)

The PanelMate Power Series 5000 Keypad unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 5000 Keypad unit in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 5000 Keypad unit Outline and Panel Cutout and Torque drawings shown 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 Power Series 5000 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.

In order to ensure proper convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

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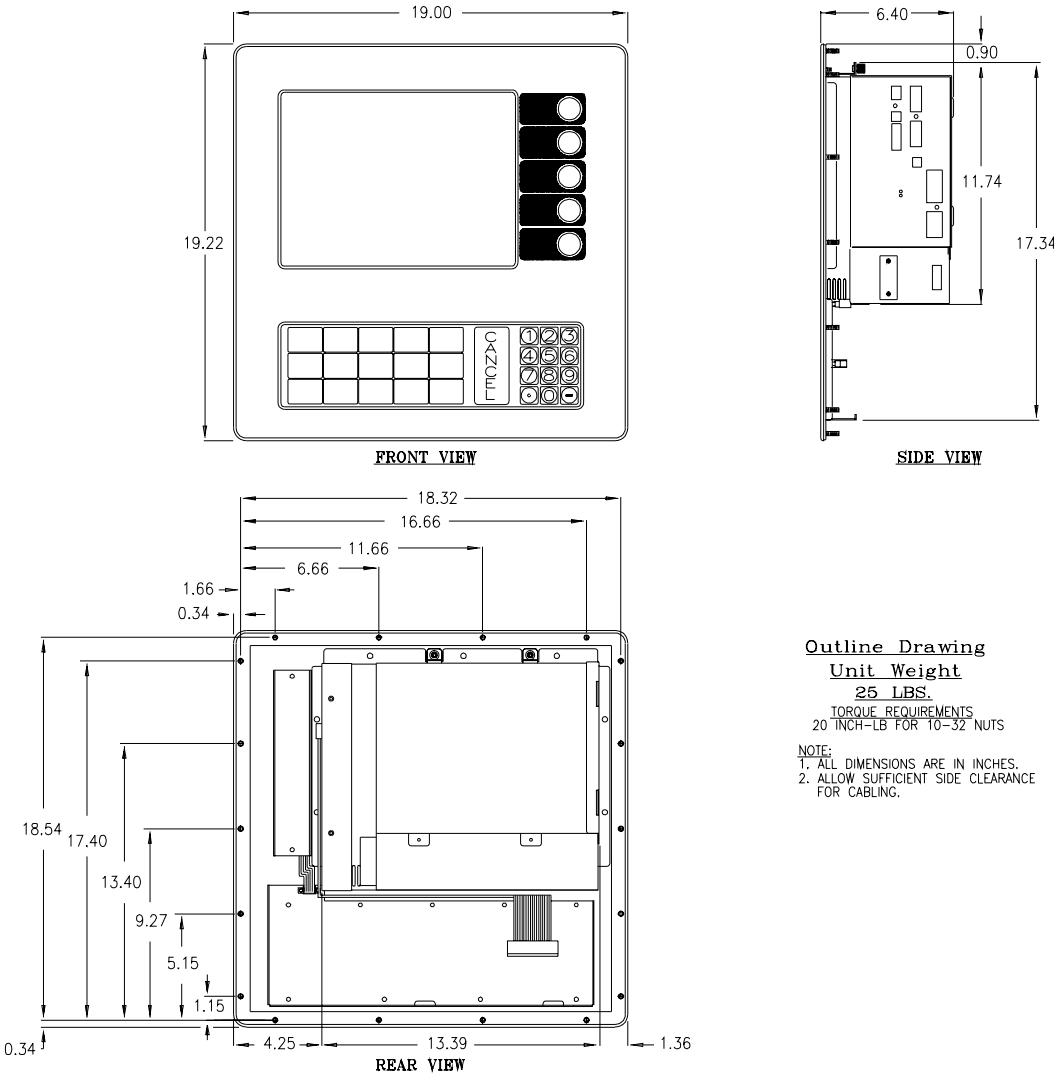


Figure 3-26 PanelMate Power Series 5000 Keypad Unit Model 5500) Outline

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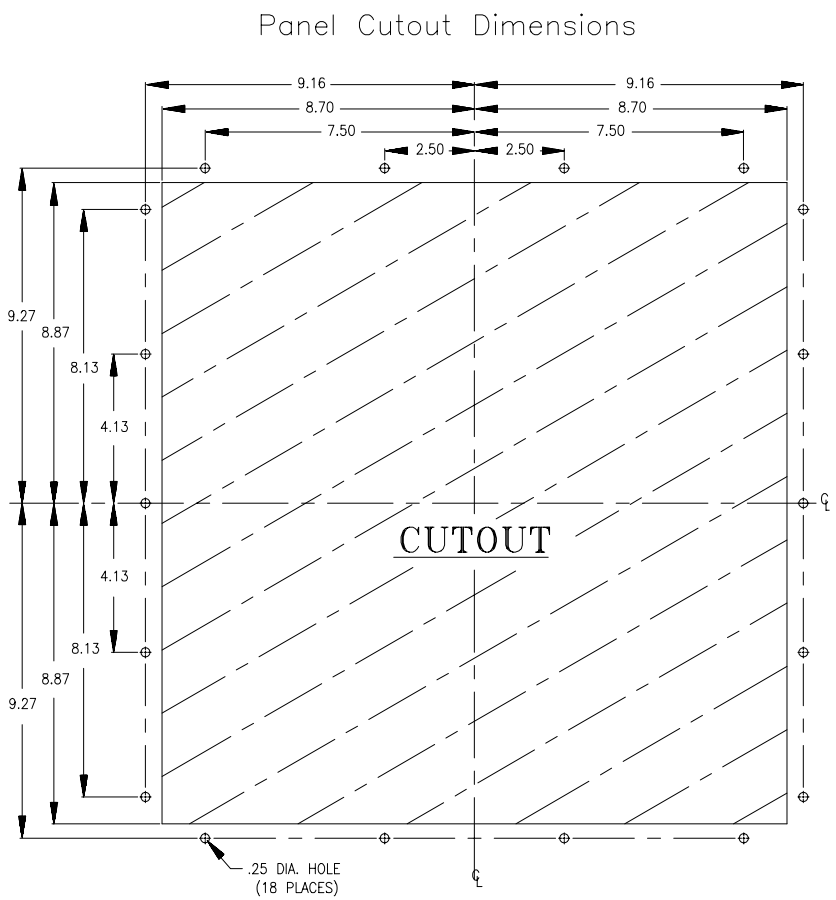


Figure 3-27 PanelMate Power Series 5000 Keypad Unit (Model 5500) Cutout and Torque Limits

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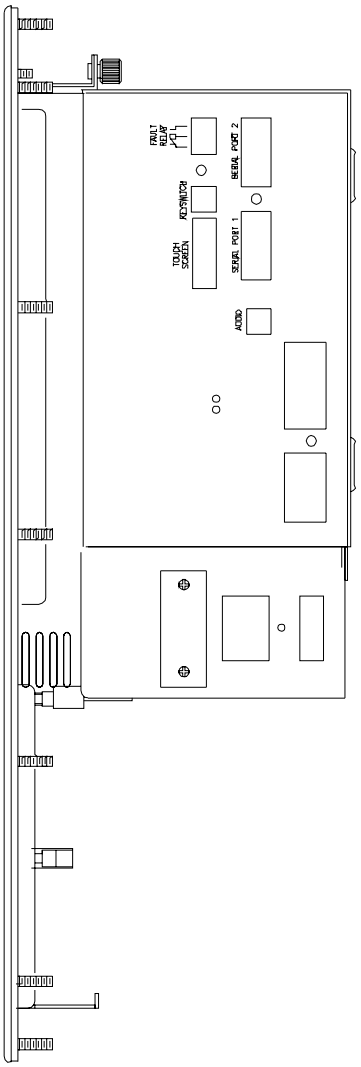


Figure 3-28 PanelMate Power Series 5000 Keypad Unit (Model 5500) Side View

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Install in an Enclosure

Make the cutout in the enclosure as shown in figure 3-33. Disassemble the PanelMate Power Series 5000 Keypad unit using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other cables.
2. Unplug the keypad connector from the Electronics Module. Make sure that you do not pull on the keypad cable.
3. Unfasten the ferrite block from the unit. Make sure the free weight of the ferrite does not damage the keypad cable.
4. Remove the Electronics Display Assembly. Do this by turning the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
5. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #10 washers and nuts that are supplied with the unit. Make sure the cable does not get pinched between the enclosure and the Front Panel.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 20 inch-pounds.

6. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
7. Plug the keypad connector into the Electronics Module. Make sure you do not press on the keypad cable.
8. Fasten the ferrite to the unit by firmly locking the Velcro pieces together.
9. You may now re-connect AC power and cables.



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PanelMate Power Series 3000 Touchscreen Unit (Models 3600, 3700, And 3900)

The PanelMate Power Series 3000 Touchscreen unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 3000 Touchscreen unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 3000 Touchscreen unit Outline and the PanelMate Power Series 3000 Touchscreen unit Panel Cutout and Torque drawings shown 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 Power Series 3000 Touchscreen 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.



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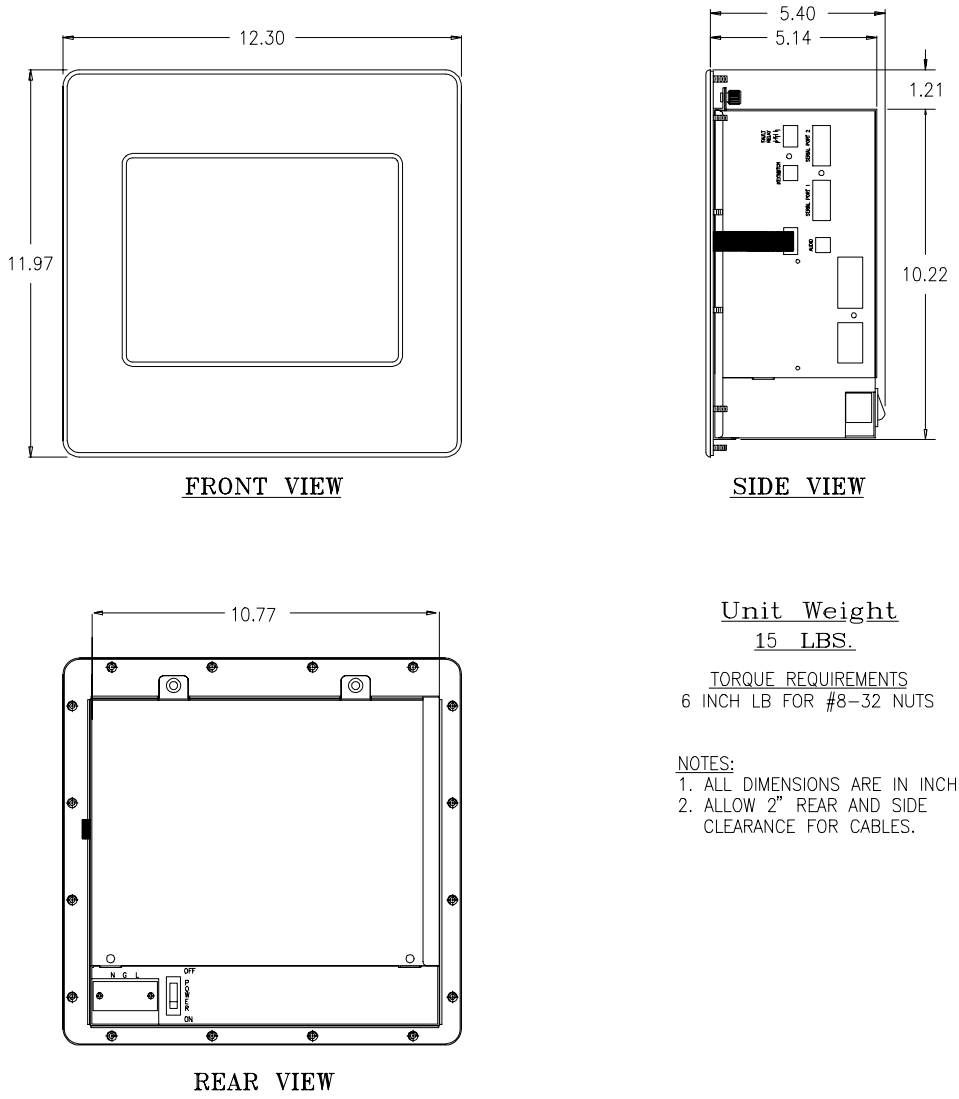


Figure 3-29 PanelMate Power Series 3000 Touchscreen Unit (Models 3600, 3700, And 3900) Outline

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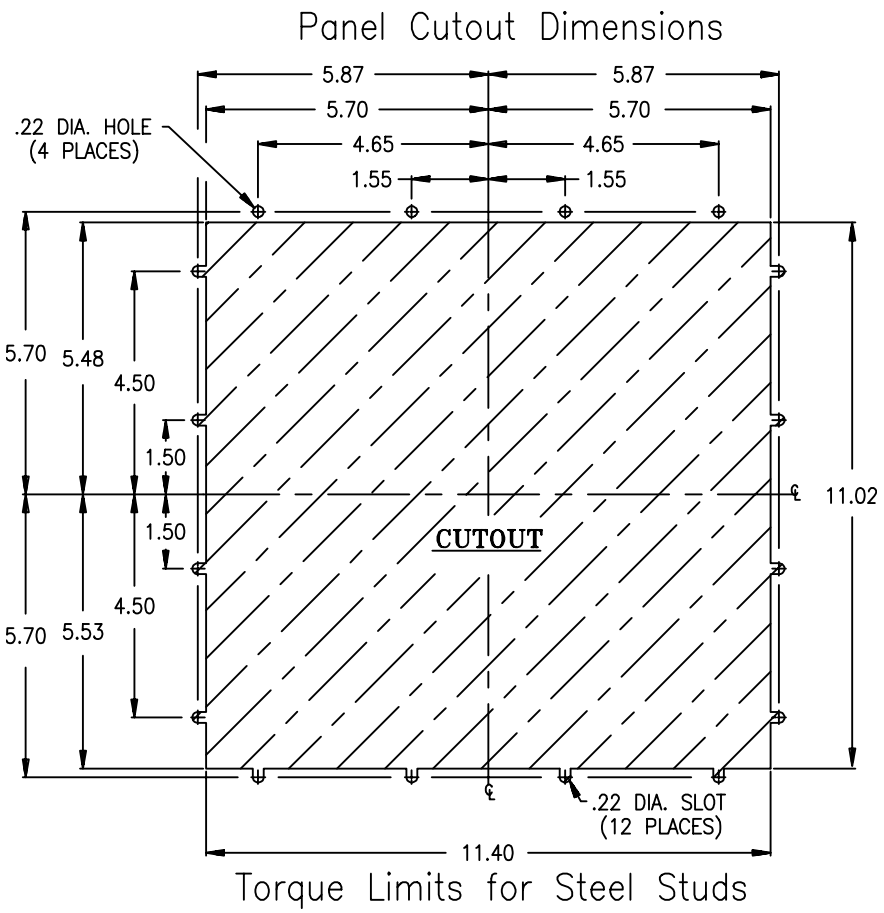


Figure 3-30 PanelMate Power Series 3000 Touchscreen Unit (Models 3600, 3700, And 3900) Cutout and Torque Limits

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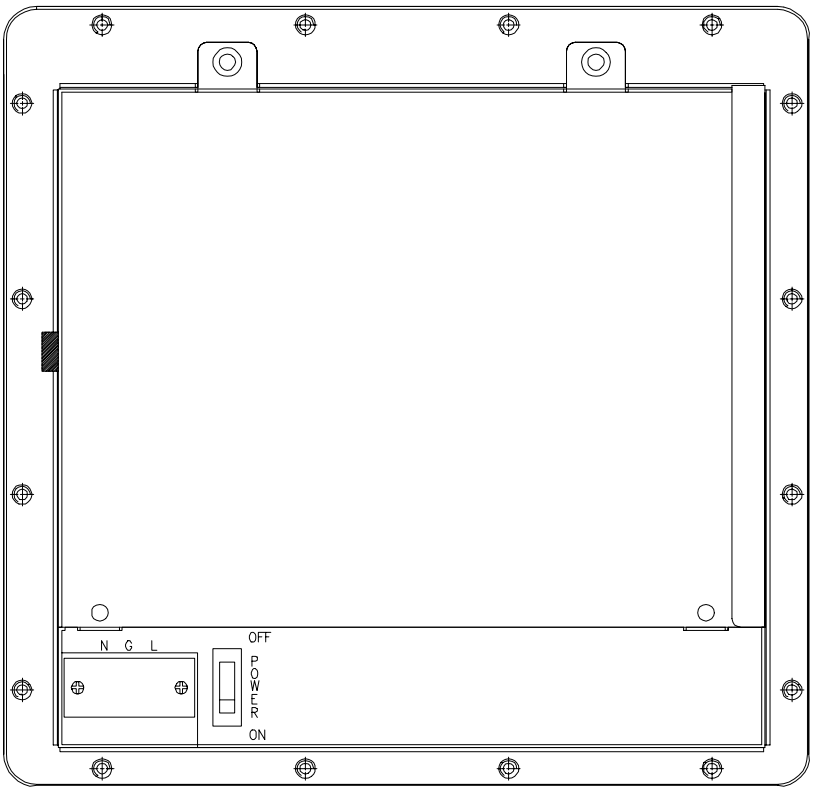


Figure 3-31 PanelMate Power Series 3000 Touchscreen Unit (Models 3600, 3700, And 3900) Rear View

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Install in an Enclosure

Note *Leave at least a 6-inch clearance between the PanelMate Power Series unit and the bottom of the enclosure for mounting the Electronics Module.*

Make the cutouts in the enclosure as shown in figure 3-44. Disassemble the PanelMate Power Series 3000 Touchscreen unit using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other cables.
2. Unplug the touchscreen cable from the Electronics Module.
3. Remove the Electronics Display Assembly. Do this by turning the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
4. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

5. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
6. Re-attach the cable to the Electronics Module.
7. You may now re-connect AC power and cables.



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PanelMate Power Series 4000 Touchscreen Unit (Model 4500)

The PanelMate Power Series 4000 Touchscreen unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 4000 Touchscreen unit in an enclosure and the installation of the various options that may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 4000 Touchscreen unit Outline and the PanelMate Power Series 4000 Touchscreen unit Panel Cutout and Torque drawings shown 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 Power Series 4000 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 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

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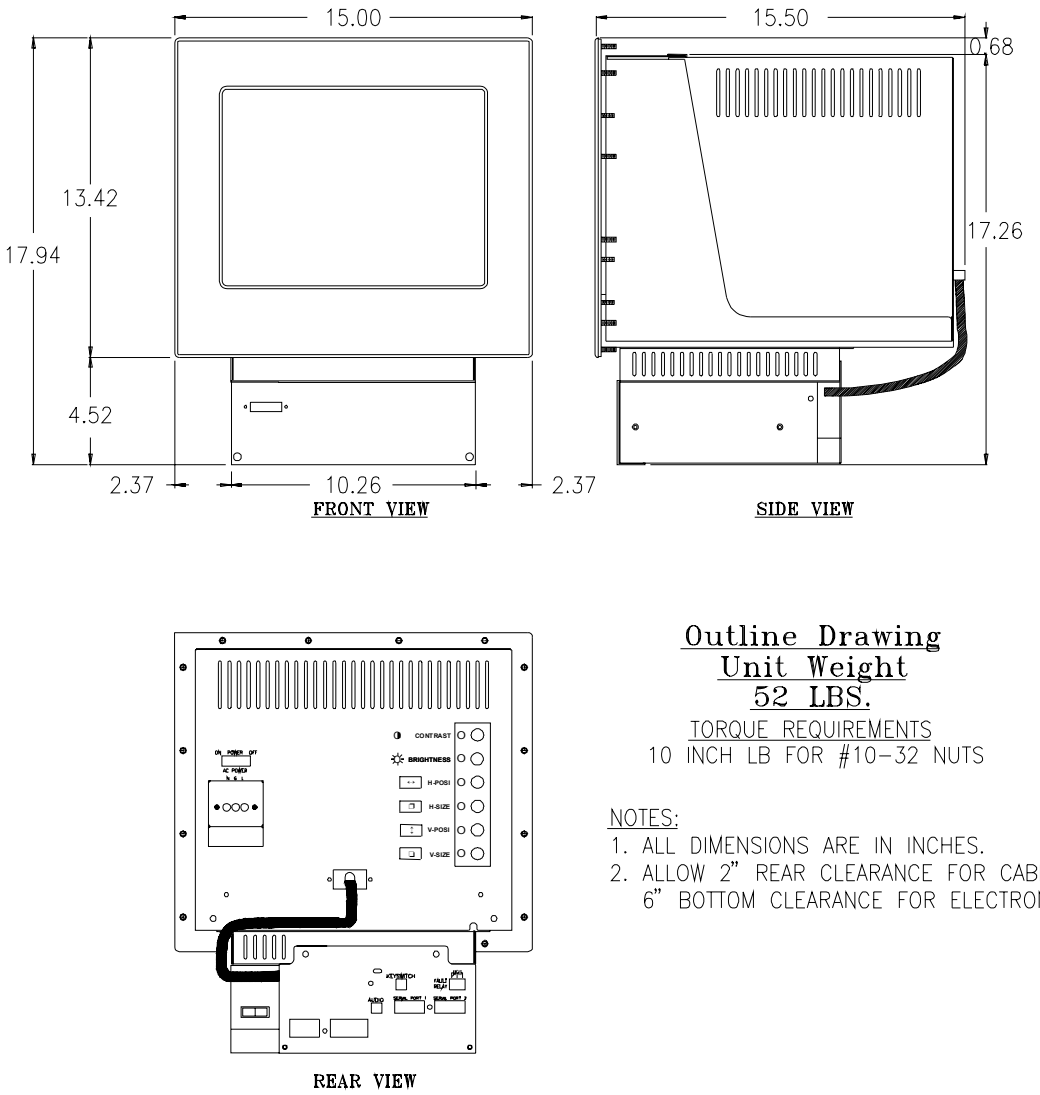


Figure 3-32 PanelMate Power Series 4000 Touchscreen Unit (Model 4500) Outline

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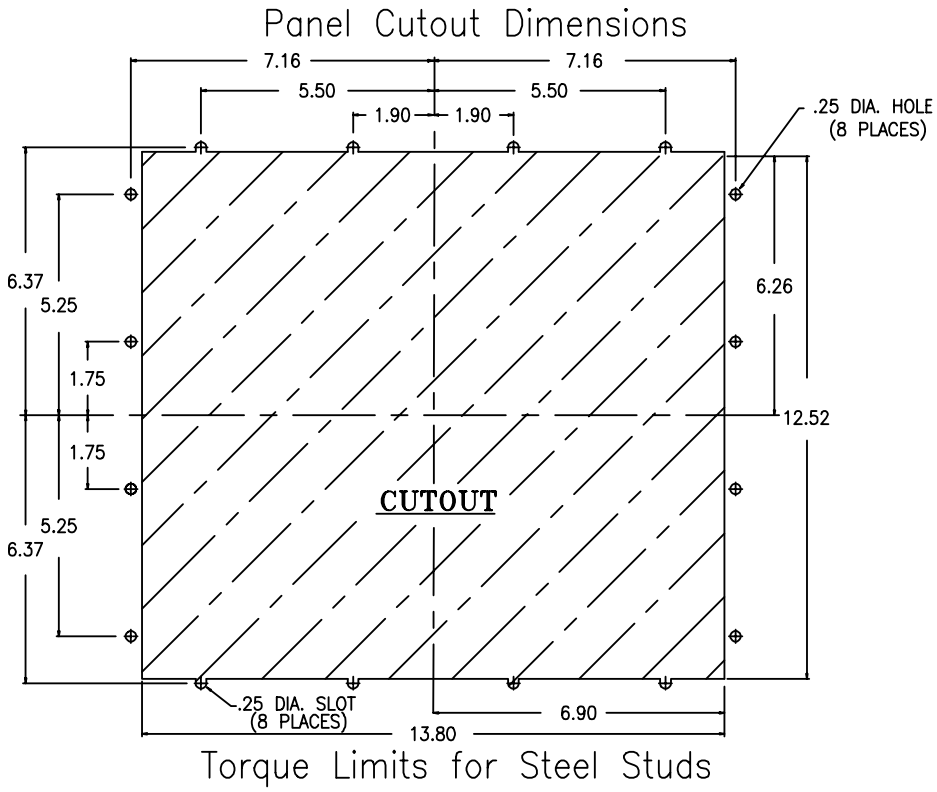


Figure 3-33 PanelMate Power Series 4000 Touchscreen Unit (Model 4500) Cutout and Torque Limits

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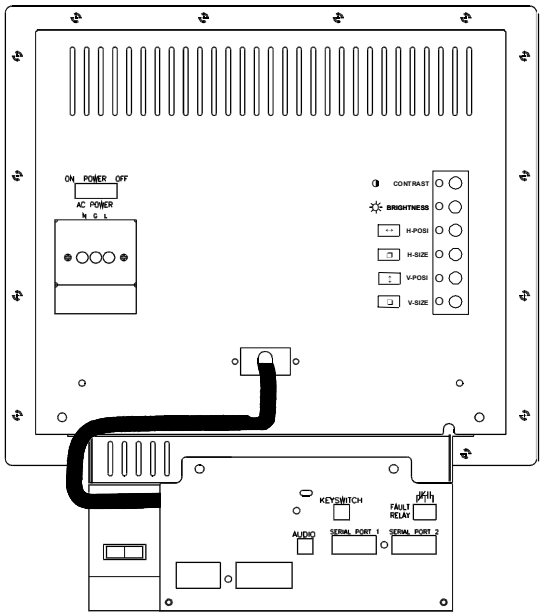


Figure 3-34 PanelMate Power Series 4000 Touchscreen Unit (Model 4500) Rear View

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Install in an Enclosure

Note *Leave at least a 6-inch clearance between the PanelMate Power Series unit and the bottom of the enclosure for mounting the Electronics Module.*

Make the cutout in the enclosure as shown in figure 3-47. Disassemble the PanelMate Power Series 4000 Touchscreen unit using the following procedure:

1. Go to the back of the unit. Remove AC power and disconnect any other cables.
2. Unplug the Monitor Module video/power cable from the Electronics Module. This cable disconnects power and the video signal to the monitor.
3. Disconnect the touchscreen cable connecting the power circuit board to the Electronics Module. Note the cord clip (15) before disconnecting.
4. Remove the six screws (11) attaching the support bracket (17) to the Main Frame (5). Carefully slide the touchscreen cable through the cutout in the Main Frame and remove the support bracket.

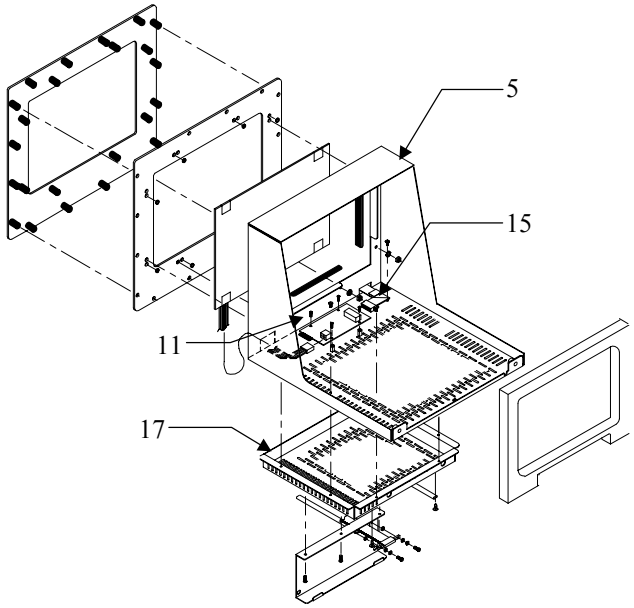


Figure 3-35 PanelMate Power Series 4000 Touchscreen Unit (Model 4500) Assembly View

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5. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 10 inch-pounds.

6. Slide the touchscreen cable through the cutout in the Main Frame (5) and secure the six screws (11) that attach the support bracket (17) to the Main Frame (5).
7. Re-connect the touchscreen cable connecting the circuit board to the Electronics Module.
8. Re-attach the Monitor Module. Slide the Monitor Module into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video/power cable from the Monitor Module to the Electronics Module.
9. You may now re-connect AC power and cables to the Monitor and Electronics Modules.



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PanelMate Power Series 5000 Touchscreen Unit (Model 5500)

The PanelMate Power Series 5000 Touchscreen unit is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Power Series 5000 Touchscreen unit in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Enclosure Sizing

Review the PanelMate Power Series 5000 Touchscreen unit Outline and Panel Cutout and Torque drawings shown 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 Power Series 5000 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.

In order to ensure proper convection cooling, we recommend a minimum 4-inch clearance above and 4-inch clearance below the unit when installed in an industrial enclosure.

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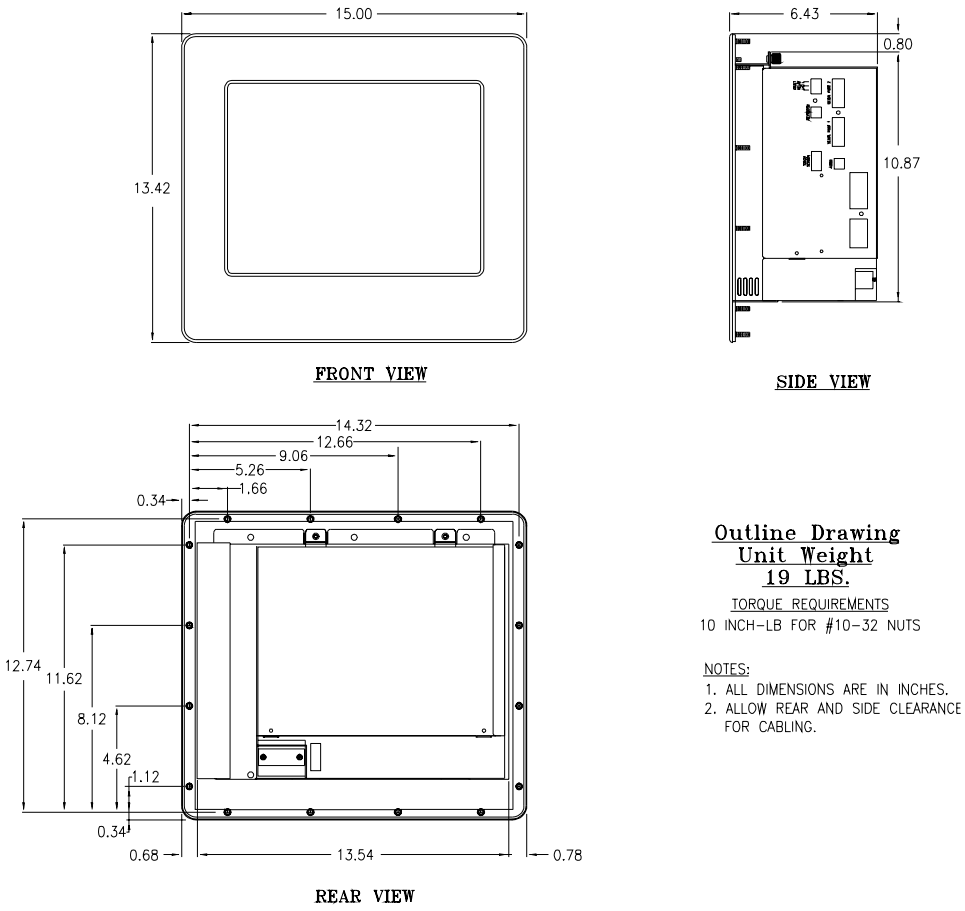


Figure 3-36 PanelMate Power Series 5000 Touchscreen Unit (Model 5500) Outline

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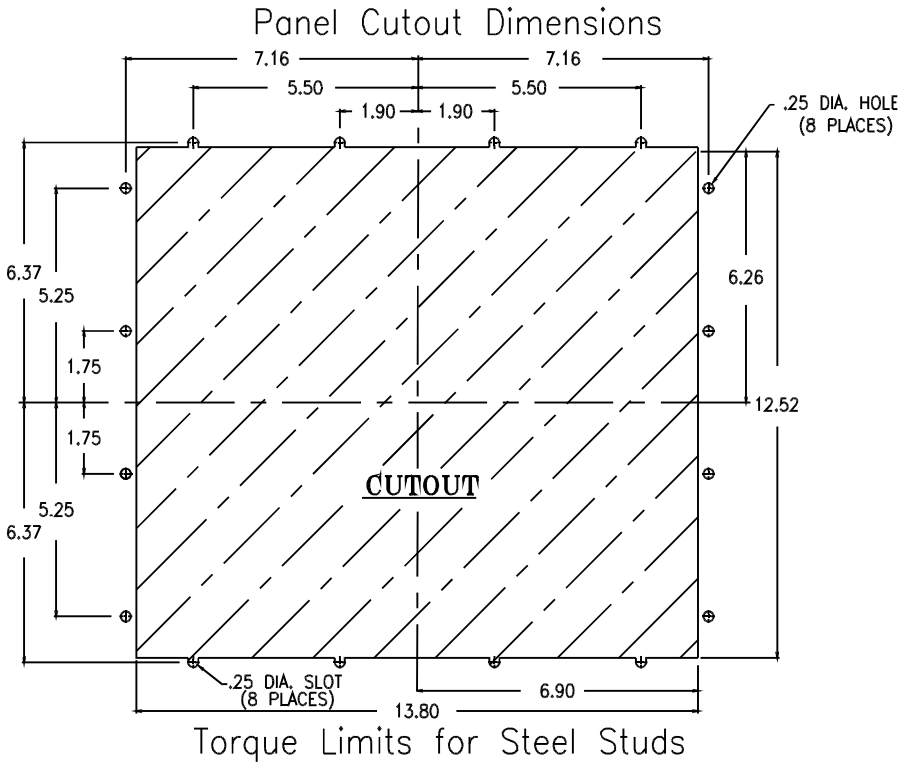


Figure 3-37 PanelMate Power Series 5000 Touchscreen Unit (Model 5500) Cutout and Torque Limits

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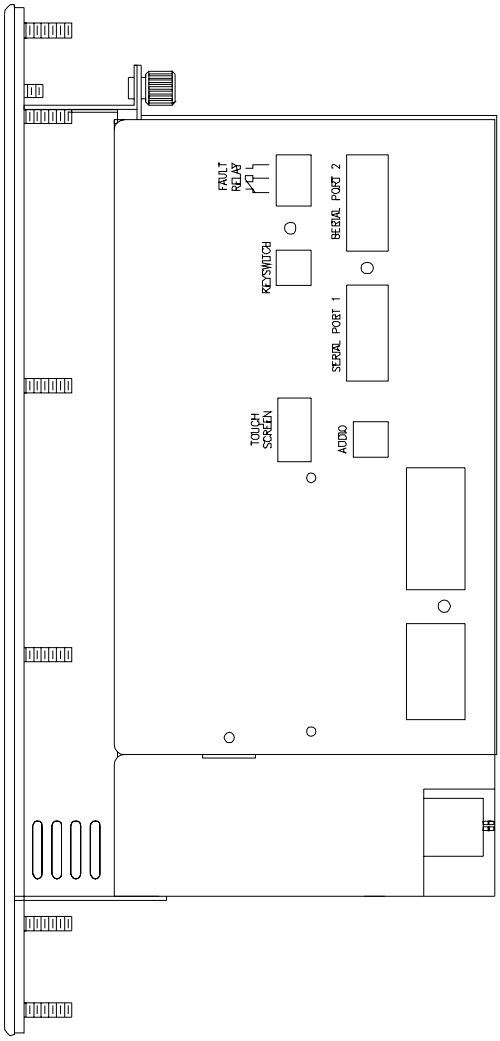


Figure 3-38 PanelMate Power Series 5000 Touchscreen Unit (Model 5500) Side View

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Install in an Enclosure

Make the cutout in the enclosure as shown in figure 3-51. Disassemble the PanelMate Power Series 5000 Touchscreen unit using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other cables.
2. Unplug the touchscreen connector from the Electronics Module. Make sure that you do not pull on the touchscreen cable.
3. Remove the Electronics Display Assembly. Do this by turning the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
4. From the front, insert the Front Panel in the cutout and fasten it with the sixteen #10 washers and nuts that are supplied with the unit. Make sure the cable does not get pinched between the enclosure and the Front Panel.

Caution

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

5. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
6. Plug the touchscreen connector into the Electronics Module. Make sure you do not press on the touchscreen cable.
7. You may now re-connect AC power and cables.



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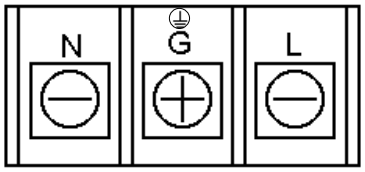
Connect AC Power

The AC power terminals and power switch are located at the back of the PanelMate Power Series unit. (The AC power terminals and power switch are located on the side of the PanelMate Power Series 3000 and 5000.) Make sure the rocker switch is in the OFF position. Remove the protective cover. Connect your AC power with user-supplied wiring.

Note If you have a PanelMate Power Series 2000 Color or a PanelMate Power Series 4000, the monitor and Electronics Module require individual power connection.

The PanelMate Power Series unit is auto-sensing and will automatically adjust to operate at either 120V AC or 230V AC. Replace the protective cover over the AC wiring.

Note Power Conditioning may be required when the PanelMate Power Series unit is installed in areas where the power quality is poor.



N - Neutral - White Wire (Typical)
G - Ground - Green/Yellow Wire (Typical)
L - Line (Hot) - Black Wire (Typical)
Minimum wire size = 0.82 mm^2 (18AWG)

Figure 3-39 Terminal Block

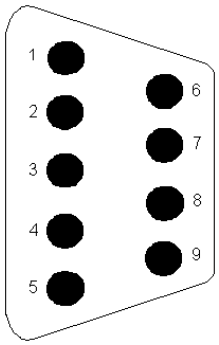
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Connection to a Serial Port

Serial Port 1 may be used for a printer, for PLC (or Host) communications, or for connection to a personal computer for upload or download. Serial Port 1 is the only port which may be used for connection to a Serial Printer.

Selection of Port 1 for a Serial Printer must be done with the Configuration Software. Refer to the PLC Name and Port Table topic in the Configuration Software Online Help and in the PanelMate Power Series Configuration Editor User's Guide.

Ports are DB9S (Sockets)



1 RS422 Transmit Data (+) (Output)
2 RS232 Receive Data (Input)
3 RS232 Transmit Data (Output)
4 RS422 Receive Data (+) (Input)
5 Signal Ground
6 RS422 Transmit Data (-) (Output)
7 RS232 Request to Send (Output)
8 RS232 Clear to Send (Input)
9 RS422 Receive Data (-) (Input)

Connection to a Personal Computer

The PanelMate Power Series unit connects to a personal computer to transfer information. You may purchase the serial transfer cable from Schneider Automation Inc. This accessory includes a 9-pin to 9-pin cable for connection between a PanelMate Power Series unit and a personal computer. It also includes a 9-pin to 25-pin adapter to permit connection to your personal computer. The cable has the following pinouts.

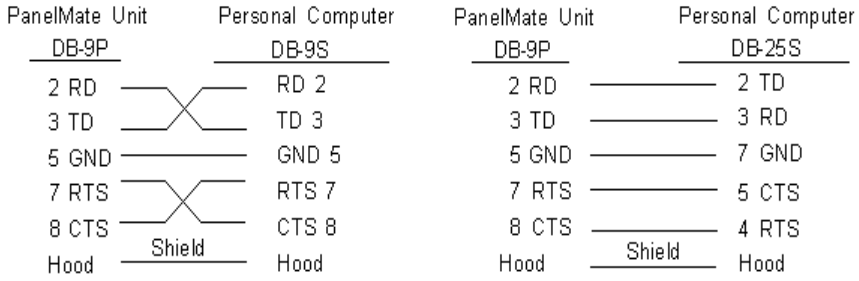


Figure 3-40 Serial Transfer Cable

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Serial Port Termination

The PanelMate Power Series unit is sent without termination as shown in the figure below.

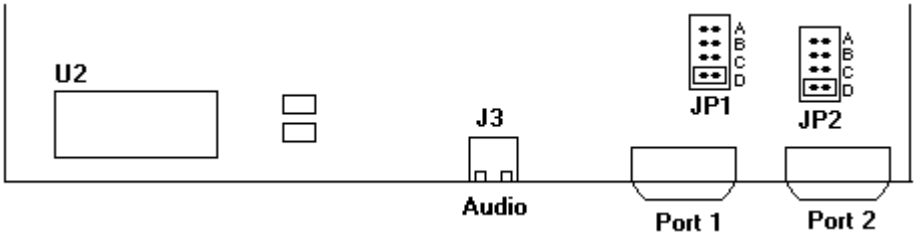


Figure 3-41 PanelMate Power Series Processor Board

This table lists the recommended termination for RS232, DH485, and RS422 communication in the PanelMate Power Series unit. For setting the termination on Port 1, configure JP1. For setting the termination on Port 2, configure JP2.

Communication	Position	Termination
RS232	D	None (factory setting)
DH485	A	120 Ohm AC coupled
RS422/RS485	B or C	Use the PLC manufacturer's recommended value: C - 220 Ohm B - 120 Ohm For a typical installation: C - 220 Ohm For a high noise environment or extreme cable distances: B - 120 Ohm

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Connection to the Fault Relay

The fault relay may be wired in normally open or normally closed configuration. It is a Form C contact, rated for 2 amps at 120V AC, 2 amps at 230V AC, and 2 amps at 28V DC resistive load.

During normal operation, the fault relay will energize after entering Run Mode. Whenever the PanelMate Power Series unit detects a communication error or system failure, the fault relay will be de-energized. It is also possible to de-energize the fault relay whenever an alarm condition occurs.

You can set the fault relay to de-energize on alarms by using the System Parameters Table. Refer to the System Parameters topic in the Configuration Software Online Help and in the PanelMate Power Series Configuration Editor User's Guide for more information.

Connection to the Audio Output

The Audio Feedback Kit is an optional accessory to the PanelMate Power Series unit.

To connect the external speaker to the PanelMate Power Series unit, simply remove it from the box, mount it, and connect the speaker to the connector labeled "AUDIO" on the rear or side of the unit.

The speaker is an 8-ohm horn with an attached 24-foot cable.

Audio output for operator input and alarms is selected in the System Parameters Table. Refer to the System Parameters topic in the Configuration Software Online Help and in the PanelMate Power Series Configuration Editor User's Guide (GM-PMAT-224) for more information.



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Connection to the Security Keyswitch

The Security Keyswitch is an optional accessory to the PanelMate Power Series unit. It is included in the Hardware Kit.

The Key Operated Selector Switch mounts in a 0.89 inches [22.5mm] hole. The approximate depth of the contact block into an enclosure is 2.22 inches [57mm].

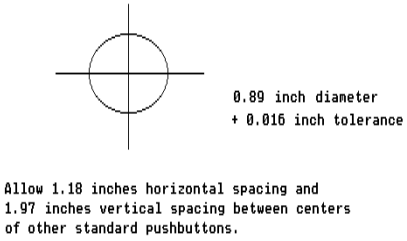


Figure 3-42 Keyswitch Diameter

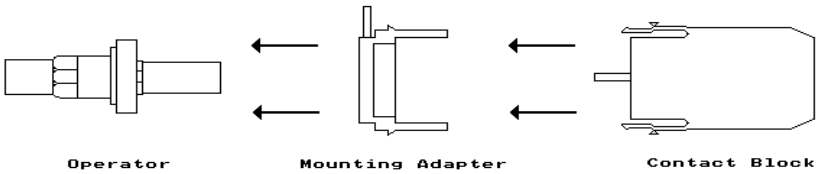
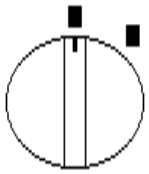


Figure 3-43 Keyswitch Side View

To assemble the keyswitch, gently push the mounting adapter onto the operator with the white locking lever facing upward. Note that the word TOP is embossed on the black rim on the end of the operator. To lock the mounting adapter to the operator, slide the locking lever toward the 1 on the mounting adapter. To connect the contact block to the mounting adapter, squeeze the pads on the top and bottom and push into the mounting adapter. Slide the contact block into slot 1 or slot 2 only. When attached properly, the print should be facing outward.

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Once assembled, you can insert the key and turn clockwise to enable entry in the PanelMate Power Series unit. When the key is returned to the center position, it disables entry into the PanelMate Power Series unit. The key can be removed in the center position.



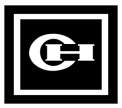
Center - Key Removal Position
Right - Entry Enabled

Figure 3-44 Keyswitch (Front View)

Minimum spacing when mounting with other Cutler-Hammer 22.5mm switches is 1.18 inches [30mm] center to center horizontal spacing and 1.97 inches [50mm] center-to-center vertical spacing.

The contact closure to enable the security keyswitch input circuit should be in the range from 0 Ohms (a short) to 50 Ohms maximum. Note that voltage should not be applied to the contact closure.

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Regular Maintenance

4

In this chapter, you will learn:

- *What regular maintenance the PanelMate unit requires*
- *How to make display adjustments*



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Regular Maintenance

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

The face of the unit should be cleaned, whenever needed, with any common, non-abrasive cleaning product. If it is necessary to clean the inside surface of a flat panel display (once the front panel has been removed), use a soft cotton cloth and avoid using water.

Every 3 to 6 months, run all the system health checks that are provided in the system. These include the Display Tests, Keypad Test or Touchscreen Test, and the Tone, Fault Relay and Battery Tests. Refer to Chapter 2 for directions on running these system health checks.

It is best to mount the PanelMate unit in a closed industrial enclosure. However, if the PanelMate unit is operating in a dusty environment and is unprotected (e.g., mounted in a control panel whose door is often left open), periodically use forced air to blow off any dust that may have accumulated on the circuit boards. Be sure to disconnect power before conducting this procedure.

There are no user replaceable fuses or batteries in the PanelMate unit.

Monitor Adjustments

Models With Software Adjustments

These models have software adjustments. There are no hardware controls on the unit:

- PanelMate 3000 (Models 3600, 3700, & 3900)
- PanelMate 5000 (Models 5200 & 5500)



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Models With Hardware Controls

These models …

- PanelMate 2000 Grayscale (Model 2600)
- PanelMate 4000 (Models 4200 & 4500)

… have these controls:

BRIGHTNESS Adjusts the brightness of the screen. Check this control first if no picture appears.

CONTRAST Adjusts the contrast of the screen.

H-POSI Adjusts the horizontal position of the screen.

H-SIZE Adjusts the horizontal size of the screen.

V-POSI Adjusts the vertical position of the screen.

V-SIZE Adjusts the vertical size of the screen.

This model …

PanelMate 2000 Color (Model 2700)

… has these controls:

BRIGHTNESS Adjusts the brightness of the screen. Check this control first if no picture appears.

CONTRAST Adjusts the contrast of the screen.

H-CENTER Adjust the horizontal position of the screen.

H-SIZE Adjusts the horizontal size of the screen.

V-CENTER Adjusts the vertical position of the screen.

V-SIZE Adjusts the vertical size of the screen.

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Touchscreen Cleaning Mode

The PanelMate touchscreen units have a Cleaning Mode that allows you to clean the touchscreen. To access the Cleaning Mode screen, follow the steps below:

1. Select the control button labeled "Get Page" from the default control buttons.
2. Select the control button labeled "More".
3. Select the control button labeled "Setup Page".
4. Select the template labeled "Cleaning Mode".
5. Press the control button labeled "Execute", the following screen will appear.

Note *The Cleaning Mode template only appears in the Setup Page if you have a PanelMate touchscreen unit.*

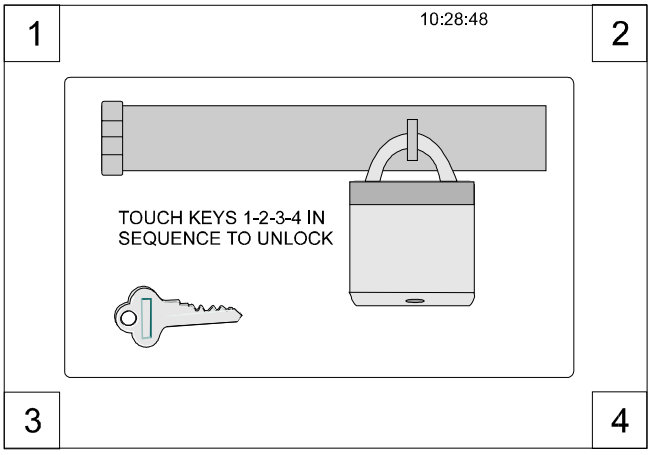


Figure 4-1 Cleaning Mode Screen

To leave the Cleaning Mode screen, you must press each numbered corner key in sequential order.

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Calibrate Touchscreen

Note *This selection lets you calibrate the touchscreen in Run Mode. To calibrate the touchscreen in Offline Mode, see Chapter 2 for more information.*

PanelMate touchscreen units have a calibration routine that must be performed to determine the boundaries of the video on your touchscreen. To access the calibration screen, select the control button labeled "Get Page" from the default control buttons. When the next set of control buttons appear, select the control button labeled "More". From the next set of control buttons, select the control button labeled "Setup Page". When you select the template labeled "Calibrate Touchscreen" and press the control button labeled "Execute", the following screen will appear.

Note *The Calibrate Touchscreen template only appears in the Setup Page if you have a PanelMate touchscreen unit.*

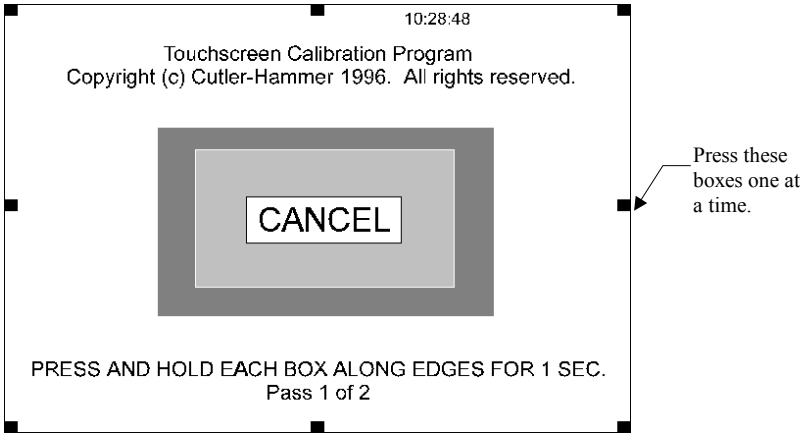


Figure 4-2 Calibration Screen

To calibrate, press the eight boxes around the touchscreen one at a time. You may press the boxes in any order but all boxes must be pressed to calibrate.

Each box will turn green (a different shade of gray) when pressed. After the first pass, the boxes will turn red (to the original shade of gray) again to indicate that the screen is ready for the second pass. When you have finished calibrating, you will be returned to the Setup Page.

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

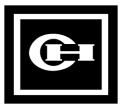
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Touchscreen Replacement

If your touchscreen becomes damaged or worn, replacement touchscreens are available as a field replaceable spare part. Instructions for replacement are included with new touchscreens.

Backlight Replacement

If your PanelMate 3000 or PanelMate 5000 backlight needs to be replaced, replacement bulbs are available as a field replaceable spare part. Instructions for replacement are included with new bulbs.



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PanelMate Power Series Troubleshooting Guide

5

This chapter will help you determine If problems with your PanelMate unit can be readily solved on your own, or if they require help from Cutler-Hammer's Customer Service Department.

Please try all recommended solutions of your problem before contacting your local distributor.

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Display Problems

No picture on the screen or screen is dull

Make sure the power is switched ON.

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

Make sure the video cable is connected to the monitor.

Refer to Monitor Adjustments section in Chapter 4 and attempt to correct problems. If this does not correct the problems, call your local distributor.

If you have a **PanelMate 3000** or **PanelMate 5000**, make sure the backlight is illuminated. If the backlight is not illuminated, check the integrity of the cable and connector from the backlight to the power inverter. If this does not correct the problem, call your local distributor.

Single message on a black screen that says "press any membrane key to resume display"

This is normal operating procedure when the System Parameters Editor has been set for Automatic Screen Blanking. To disable this feature, set Screen Blanking Inactivity Period to OFF. Refer to the System Parameters topic in the Configuration Software online help for more information.

Watchdog timeout message on a screen that says "Watchdog Timeout. Press Cancel key to continue"

A watchdog timeout error may indicate a problem with PanelMate hardware or it may be related to AC power. If problems persist, call your local distributor. Please have the unit's serial number ready for the distributor who serves your call.

Touchscreen Problems

Touchscreen does not work at all or does not perform reliably

Check integrity of cables and connectors and execute the Touchscreen test. Refer to Execute the System Diagnostics section in Chapter 2 for more information.

Touchscreen works sporadically or areas are hard to hit

Re-calibrate touchscreen using the procedure described in Chapter 4.



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TouchPanel Problems

Keyboard does not work

Check the integrity of the cable and connectors.

One or several membrane keys do not work

Use the Membrane Keyboard Test to check if the keys are sending a signal to the PanelMate unit. Refer to the Execute the System Diagnostics section in Chapter 2 for more information.

Control Button Problems

One or several buttons do not work

Use the Membrane Keyboard Test to check if the keys are sending a signal to the PanelMate unit. Refer to the Execute the System Diagnostics section in Chapter 2 for more information.

Audio Output Problems

No sound is produced

Check the System Parameters Table to make sure you have the audio output set for either LOW, MED, or HIGH volume. Refer to the Execute the System Diagnostics section in Chapter 2 for more information.

Check the connection of the speaker to the PanelMate unit.

Check the integrity of the speaker cable.

If you have purchased your own speaker, make sure it is an 8-ohm speaker. Go offline and run the audio tests. Refer to the Connection to the Audio Output section in Chapter 3 for more information.

Sound is only produced for operator input or alarms

Check the System Parameters Table to make sure you have the audio output set correctly. Refer to the System Parameters topic in the Configuration Software online help for more information.

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Fault Relay Problems

Fault relay is not energized at start of Run Mode operation

View the PanelMate unit screen to check for system or communications errors that may be reported. Refer to the Error Codes topic in the Configuration Software online help for more information.

Use the fault relay health check to make sure the relay is working properly. Refer to the Connection to the Fault Relay section in Chapter 3 for more information.

If you are using Generic Protocol, make sure your host is not polling the PanelMate unit before it has a chance to energize the relay.

Fault relay de-energizes when an alarm occurs

This is a normal operation if you have used the System Parameters Table to set this feature. Use the System Parameters Table to disable this feature. Refer to the System Parameters topic in the Configuration Software online help for more information.

Printer Problems

Printer will not work

Check to make sure the printer cable is connected to Port 1.

Check the Port Parameter Table. Make sure Port 1 is selected for PRINTER use.

Verify that all communications parameters match between the PanelMate unit and your printer.

Check to make sure the printer is ready; if the printer is out of paper or off-line, it will not work.

Check the integrity of the cable and connections. Verify that the cable is wired properly.

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

Verify that the printer is set for serial communications.



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Problems when Transferring Memory

Cannot make a PC (Personal Computer) transfer

Make sure that the cable connecting the PC serial port to PanelMate Serial Port #1 is the one sold by Cutler-Hammer IDT.

Check the integrity of the PanelMate communications port. Do this by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics. Make sure you are connected to the PC serial port selected in the PanelMate Transfer - Port Params. Tab dialog box.

Cannot download from the PC

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

Real-Time Clock Problems

The time is inaccurate following a power disruption

This is a symptom of a dead or low battery. Check the integrity of the battery. Do this by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics.

Communications Problems using the Generic Protocol

PanelMate unit does not respond at all

Verify that the host is using the frame format exactly as specified in the Generic Protocol Driver Manual.

Make sure that the cable connecting the host to the PanelMate unit is properly wired.

Verify that you have properly set the communications parameters on the host to match the parameters of the PanelMate serial port.

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



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Specific Error Messages

Error encountered during initialization of data structures

Return to the Configuration Mode and check the PLC Name and Port Table. Especially verify all Network ID numbers and the default PLC. A default PLC must be named, even if you are using one PLC.

Error in memory checksum calculation

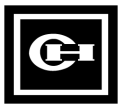
This error message indicates that all or part of the system configuration memory is corrupted. Most commonly, this error is displayed after improperly exiting a system table. To correct this error, recalculate the checksum by entering and exiting the table as normal.

Errors identified by audible tones when message display is not possible

For certain fatal startup errors which do not permit fault messages to be displayed on the screen, the PanelMate unit will generate special alarm tones to an alarm horn connected to the Audio port. If the real-time clock is inaccessible, a 1000 Hz tone will be generated in the following repeating pattern: .5 second tone, .5 second pause, .5 second tone, 3 second pause.

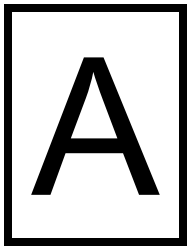
If the video subsystem has fatal errors, an alarm tone pattern is generated to indicate the actual failures. A 1000 Hz tone with .25 seconds duration indicates a test has passed. A 800 Hz tone with .5 second duration indicates a test has failed. A 3 second pause occurs at the end of the tone sequence. The tests are performed in the following order:

- Serial Port 2
- Serial Port 1
- Real-Time Clock (Timing)
- Real-Time Clock Battery
- DRAM
- Watchdog
- Character Cell SRAM
- Frame Buffer SRAM



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Detailed Specifications



In this chapter, you will learn specific information about the PanelMate Power Series

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Introduction

This appendix gives detailed specifications for all models of the PanelMate Power Series 2000 through 5000.

The following information is provided for each model:

- Main Processor
- Display
- Environment
- Electrical Requirements
- Serial Ports
- Fault Relay
- Audio Output
- Security Keyswitch Input
- Other

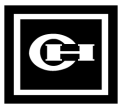
PanelMate 2000 Grayscale Keypad Unit (Model 2600)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 Khz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	256 levels with 8-state PowerBlink



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Environment

Temperature	Operating Ambient	0^{o}-50^{O}C
	Storage	-20^{O}-65^{O}C
Humidity	20-90% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement . 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectionable display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.1 Gauss (8A/m).	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power	55W	
Current:	rms	0.8A
	Repetitive Peak	2.0A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	23 pounds
Equipment Heat Output	188 BTU/hr. (55 watts)



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PanelMate 2000 Color Keypad Unit (Model 2700)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

H orizontal Scan Freq.	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Color	256 colors with 8-state PowerBlink
Dot Pitch	.28 mm

Touchscreen

Resolution	256 x 256 touch cells

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 65^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	

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Environment (Cont.)

Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement. 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectionable display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.1 Gauss (8A/m).	
Surge Immunity	EC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power		
Electronics Unit	**Monitor**	**Total**
30W	50W	80W
RMS:		
0.3A	0.7A	1.0A
Repetitive Peak		
0.75A	1.75A	2.5A
Peak Inrush:		
16A Max	16A Max	25A Max



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Serial Ports

Rate	Selectable; 110 to 38,400 baud
	All serial ports are DB9S (Sockets)
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	32 pounds
Equipment Heat Output	80 watts (273 BTU/hr)

PanelMate 3000 Grayscale Keypad Unit (Model 3600)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

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Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	256 levels with 8-state PowerBlink

Environment

Temperature	Operating Ambient	0^{O} to 45^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-85% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	.25g at 10-500 Hz
	Non-operating:	1.2g at 10-500 Hz
Shock	Operating:	3g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable:	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	18 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

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PanelMate 3000 Color Dual-Scan Keypad Unit (Model 3700)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Color	256 colors with 8-state PowerBlink

Environment

Temperature	Operating Ambient	0^{O}-40^{O}C
	Storage	-20^{O}-60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	1g at 10-500 Hz
	Non-operating:	1g at 10-500 Hz
Shock	Operating:	15g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level



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Environment (Cont.)

AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.
Surge Immunity	IEC 801-5, Level 3
Dielectric Withstand	UL-508, CSA C22.2
ESD Immunity	IEC 801-2, Level 4

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact	
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)	
Connector	Removable three-terminal connector	

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

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Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	18 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

PanelMate 3000 Color Active Matrix TFT Keypad Unit (Model 3900)

Main Processor

CPU	Motorola 68020 microprocessor	
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 10-yearn minimum life.	

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Color	256 colors with 8-state PowerBlink

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	

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Environment (Cont.)

NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	1g at 10-500 Hz
	Non-operating:	1g at 10-500 Hz
Shock	Operating:	15g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

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Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	18 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

PanelMate 4000 (Split Architecture) Keypad Unit (Model 4200)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)



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Display (Cont.)

Color	256 colors with 8-state PowerBlink
Dot Pitch	0.28 mm
Electron Gun Configuration	In-line

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 65^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement. 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectionable display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.1 Gauss (8A/m).	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power		
Electronics Unit	**Monitor**	**Total**
30W	50W	80W
rms		
0.3A	0.7A	1.0A
Repetitive Peak		
0.75A	1.75A	2.5A
Peak Inrush		
16A Max	16A Max	25A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

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Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	55 pounds
Equipment Heat Output	80 watts (273 BTU/hr)

PanelMate 4000 Keypad Unit (Model 4500)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Color	256 colors with 8-state PowerBlink
Dot Pitch	0.28 mm
Electron Gun Configuration	In-line

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Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 65^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak dsplacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement. 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10000 feet above sea level
	Non-operating	30000 feet above sea level
AC Magnetic Field Influence	Objectionable display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.1 Gauss (8A/m).	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	



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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power		
Electronics Unit	**Monitor**	**Total**
30W	50W	80W
rms		
0.3A	0.7A	1.0A
Repetitive Peak		
0.75A	1.75A	2.5A
Peak Inrush		
16A Max	16A Max	25A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

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Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	55 pounds
Equipment Heat Output	80 watts (273 BTU/hr)

PanelMate 5000 Keypad Unit (Model 5200)

Main Processor

CPU	Motorola 68020 microprocessor
Memory	1MB 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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	256 colors with 8-state PowerBlink

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	

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Environment (Cont.)

NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-500 Hz @ 1G
	Non-operating:	10-500 Hz @ 1G
Shock	Operating:	30g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC & DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power	40W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	15A Max

Serial Ports

Rate	Selectable; 110 to 38,400 baud	
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

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Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	25 pounds
Equipment Heat Output	137 BTU/hr. (40 watts)

PanelMate 5000 Keypad Unit (Model 5500)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.



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Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	256 colors with 8-state PowerBlink

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-500 Hz @ 1G
	Non-operating:	10-500 Hz @ 1G
Shock	Operating:	30g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC & DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power	40W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	15A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	25 pounds
Equipment Heat Output	137 BTU/hr. (40 watts)



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PanelMate 3000 Grayscale Touchscreen Unit (Model 3600)

Main Processor

CPU	Motorola 68020 microprocessor
Memory	1MB 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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	256 x 256 pixels
Grayscale	256 levels with 8-state PowerBlink

Touchscreen

Resolution	256 x 256 touch cells

Environment

Temperature	Operating Ambient	0^{O} to 45^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-85% noncondensing	
Pollution	Pollution Degree 1 – Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	.25g at 10-500 Hz
	Non-operating:	1.2g at 10-500 Hz
Shock	Operating:	3g
	Non-operating:	30g

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Environment (Cont.)

Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

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Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	15 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

PanelMate 3000 Color Dual-Scan Touchscreen Unit (Model 3700)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	256 x 256 pixels
Color	256 colors with 8-state PowerBlink

Touchscreen

Resolution	256 x 256 touch cells

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Environment

Temperature	Operating Ambient	0^{O} to 40^{O}C
	Storage	- 20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	1g at 10-500 Hz
	Non-operating:	1g at 10-500 Hz
Shock	Operating:	15g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric	UL-508, CSA C22.2	
Withstand		
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

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Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	16 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

PanelMate 3000 Color Active Matrix TFT Touchscreen Unit (Model 3900)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

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Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	256 x 256 pixels
Color	256 colors with 8-state PowerBlink

Touchscreen

Resolution	256 x 256 touch cells

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	1g at 10-500 Hz
	Non-operating:	1g at 10-500 Hz
Shock	Operating:	15g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields.	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

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Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15/+10%
Frequency	50/60 Hz, +/- 5%	
Power	35W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max

Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	16 pounds
Equipment Heat Output	119 BTU/hr. (35 watts)

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PanelMate 4000 Touchscreen Unit (Model 4500)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	256 x 256 pixels
Color	256 colors with 8-state PowerBlink
Dot Pitch	0.28 mm
Electron Gun Configuration	In-line

Touchscreen

Resolution	256 x 256 touch cells

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 65^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	

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Environment (Cont.)

Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement. 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectionable display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.1 Gauss (8A/m).	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power		
Electronics Unit	**Monitor**	**Total**
30W	50W	80W
rms		
.3A	0.7A	1.0A
Repetitive Peak		
0.75A	1.75A	2.5A
Peak Inrush		
16A Max	16A Max	25A Max

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Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	52 pounds
Equipment Heat Output	80 watts (273 BTU/hr)



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PanelMate 5000 Touchscreen Unit (Model 5500)

Main Processor

CPU	Motorola 68020 microprocessor
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 10-year minimum life.

Display

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Color	256 colors with 8-state PowerBlink
Dot Pitch	0.28 mm
Electron Gun Configuration	In-line

Touchscreen

Resolution	256 x 256 Cells

Environment

Temperature	Operating Ambient	0^{O} to 50^{O}C
	Storage	-20^{O} to 60^{O}C
Humidity	20-95% noncondensing	
Pollution	Pollution Degree 1 - Rated for exposure to dry or non-conductive pollutants only.	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	

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Environment (Cont.)

Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement. 57-500 Hz at 1g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement. 57-500 Hz at 2.5g acceleration
Shock	Operating:	30g
	Non-operating:	30g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Unaffected by low level magnetic fields	
Surge Immunity	IEC 801-5, Level 3	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2, Level 4	

Electrical Requirements

Voltage	Auto Sensing	120/230VAC, -15%/+10%
Frequency	50/60Hz, +/- 5%	
Power	40W	
Current:	rms	0.5A
	Repetitive Peak	1.25A
	Peak Inrush	16A Max



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Serial Ports

Rate	Selectable;	110 to 38,400 baud
	All serial ports are DB9S (Sockets)	
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels.	

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	2 Watts into 8 OHM speaker
Connector	Removable two-terminal connector for industrial speaker

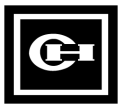
Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	19 pounds
Equipment Heat Output	40 watts (137 BTU/hr)

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Installation Guidelines

B

In this chapter, you will learn:

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

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Overview

This document explains important considerations for installation of the PanelMate Power Series.

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. The front panels of the PanelMate Power Series provide a NEMA 4 or NEMA 12 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 sufficient space above and below the unit and on either side (see figures B-1 and B-2). PanelMate 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 flat surface blocks vents on the bottom of the unit, inhibiting convection cooling and damaging the unit.

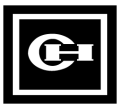
Careful enclosure sizing is important for proper heat dissipation. Since other devices mounted in the same enclosure also generate heat, consider the heat output of all equipment in a given enclosure when choosing its size.

If the inside temperature of the enclosure is above the unit's recommended range (see tables B-1 through B-8), 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.

Heat rises to the top of an enclosure, and the temperature inside can vary greatly from bottom to top. A fan can be used to circulate air within the enclosure and maintain a more uniform temperature. Make sure the magnetic properties of equipment used to cool the enclosure do not interfere with equipment operation.

CRT monitors are especially susceptible to magnetic fields.

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



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Your enclosure should be constructed of 14 gauge 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, the inside/outside pressure differential not exceed 0.5 PSI (13.8 inches water column). If needed, your unit can withstand a differential of up to 4.6 PSI (127 inches water column).

Cutler-Hammer recommends that you never ship an enclosure with a PanelMate Power Series 2000 or PanelMate Power Series 4000 CRT unit mounted inside. This may seriously damage the equipment. Units should be shipped in their original packing material, then mounted in an enclosure when it reaches its final destination.

Tables have 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, the wattage dissipated by the PanelMate unit (the PanelMate Power Series 2000 dissipates 55 watts, the PanelMate Power Series 2000 Color dissipates 80 watts, the PanelMate Power Series 3000 dissipates 35 watts, PanelMate Power Series 4000 dissipates 80 watts, and the PanelMate Power Series 5000 dissipates 40 watts), no additional methods enclosure having all sides uninsulated and sufficient space between the unit and the top and bottom of the enclosure (see figures B-1 and B-2). From this chart, you can predict how much the internal temperature will rise with different size enclosures.

The tables are 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 product's conformance to published specifications lies with you, the customer. For specific information about enclosure selection and cooling methods, contact your enclosure vendor.

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Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
24x20x12	10°C
24x24x12	8.9°C
30x24x12	7.2°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-1 Heat Output Specifications for the PanelMate Power Series 2000 Grayscale Keypad Unit (Model 2600)

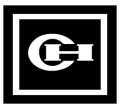
Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
24x20x12	15.0°C
24x24x12	12.8°C
30x24x12	10.6°C

Assumptions:

- 14 gauge cold rolled steel
- All sides uninsulated (Free Standing)
- 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-2 Heat Output Specifications for the PanelMate Power Series 2000 Color Keypad Unit (Model 2700)



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Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
20x16x8	11.1°C
20x20x8	8.9°C
24x20x8	7.2°C
24x24x8	6.7°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-3 Heat Output Specifications for the PanelMate Power Series 3000 Keypad Unit (Models 3600, 3700, & 3900)

Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
20x20x16	15°C
24x20x16	12.8°C
24x24x16	11.1°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-4 Heat Output Specifications for the PanelMate Power Series 4000 Keypad Unit (Models 4200 & 4500)



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Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
30x24x8	6.1°C
30x24x10	5.6°C
30x24x8	5°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-5 Heat Output Specifications for the PanelMate Power Series 5000 Keypad Unit (Model 5500)

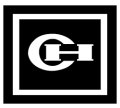
Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
20x20x8 8.	9°C
24x20x8	7.2°C
24x24x8	6.7°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-6 Heat Output Specifications for the PanelMate Power Series 3000 Touchscreen Unit (Models 3600, 3700, & 3900)



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Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
30x24x16	9.4°C
30x24x20	8.3°C
36x30x16	6.6°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 6-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-7 Heat Output Specifications for the PanelMate Power Series 4000 Touchscreen Unit (Model 4500)

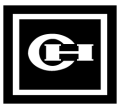
Enclosure Size vs Average Internal Temperature Rise

Standard Enclosure Size (Inches)	Average Internal Temperature Rise
24x24x8	7.2°C
24x24x10	6.7°C
24x30x8	6.1°C

Assumptions:

* 14 gauge cold rolled steel
* All sides uninsulated (Free Standing)
* 4-inch clearance between the PanelMate unit and the top and bottom of the enclosure

Table B-8 Heat Output Specifications for the PanelMate Power Series 5000 Touchscreen Unit (Model 5200 & 5500)



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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 system's operation and lifespan. See the following figures for a list of environmental operating parameters for the PanelMate Power Series.

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. Magnetic fields greater than 0.1 Gauss can cause picture jitter and discoloration in video monitors. The flat-panel displays of the PanelMate 3000 and PanelMate 5000 are virtually unaffected by low level magnetic fields.

Line power provided to any electronic equipment should be relatively free of voltage drifts, spikes, and drop-outs. Spike suppressers, uninterruptable power supplies and other devices can be used to condition line voltage. Line power wiring should be 0.82mm^2 (18 AWG) minimum. Line frequency should also be maintained within noted tolerances. 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. Line power wiring should be 0.82mm^2 (18 AWG) minimum. When planning the location and placement of wiring, make sure high-power lines are not close 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.



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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.

Most RS232 serial communication cables should be no longer than 50 feet. 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.

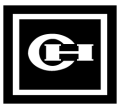
All communication cables should be shielded, with the shield properly grounded at both ends.

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 manufacturer's 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 multiple points along the run.



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Accessories and Options

C

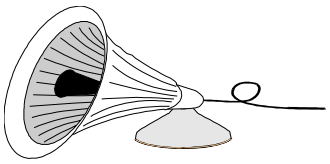
In this chapter, you will learn about the accessories and options available for the PanelMate unit. For more information, contact your local distributor.

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Accessories

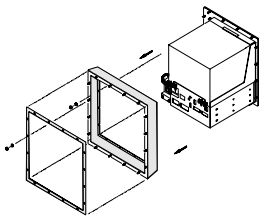
Audio Feedback Kit

An 8 ohm speaker for alarm signals and operator feedback and a 24-foot cable for direct connection to the PanelMate unit.



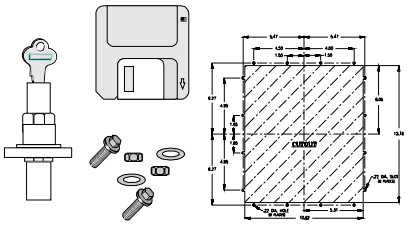
Mounting Collars

A two-inch collar for mounting the PanelMate unit in a shallow enclosure. Available in standard finish or stainless steel.



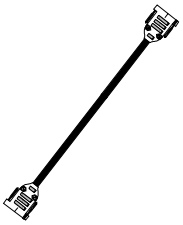
Support Kit

Transfer Utility software, cutout drawings, spare hardware kit, and security keyswitch.



Transfer Cable

RS232 cable with DB-9 connectors for upload/download between the standard DOS-based personal computer communication port and the PanelMate unit's serial port 1. DB-9 to DB-25 adapter included.



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PLC Cables

PLC cables to ensure proper communication between your PanelMate unit and your PLC.



Options

Option Memory Expansion Kit (#0721)

This option includes the option memory module, installation disk, and electrostatic protection. The kit enables more than one PLC driver to run simultaneously in the target PanelMate online unit.

Advanced Trend Template (#0611)

This option is a "one-time use" diskette which enables the advanced trend functionality to run on a single target PanelMate unit so that advanced trend configurations created in the Configuration Software can be displayed. Advanced Trend features 6 pens that can be triggered by time or event.

Modicon Modbus Communications

This option is a "one-time use" diskette which enables communications to Modicon PLCs via the Modbus network (ASCII or RTU). The option installs in a single target PanelMate online unit.

- #2424 For models #24XX
- #2624 For models #26XX
- #2724 For models #27XX
- #3524 For models #36XX, #37XX, #39XX
- #4524 For models #42XX, #45XX, #52XX, #55XX

Requires the Modicon PLC driver as part of the Windows Configuration Software Options #0620, #06MB or #07MB to configure communications to Modicon PLCs.

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Allen-Bradley DH-485 (SLC-500) Communications (#XX25)

This option is a "one-time use" diskette. Licensed under A-B 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 A-B 1747-AIC module is only required when simultaneous interface to PanelMate and PLC programming equipment is desired.

- #2425 For models #24XX, #26XX
- #0725 For models #27XX, #36XX, #37XX, #39XX, #42XX, #45XX, #5200, #55XX

Requires Windows Configuration Software Option #0620, #06AB, or #07AB to configure communications to A-B PLCs.

AcceleratI/On Interface to Allen-Bradley PLCs (#XX41)

This option is an interface board that installs into the Electronics Module. Licensed under A-B patented technology, it provides a communication port for connecting directly to the user's choice of Allen-Bradley PLC networks: Remote I/O Link, Data Highway, or Data Highway Plus. PanelMate serial ports can be used simultaneously with AcceleratI/On.

- #2441 For models #24XX, #26XX
- #0741 For models #27XX, #36XX, #37XX, #39XX, #42XX, #45XX, #5200, #55XX

Requires Windows Configuration Software Option #0620, #06AB, or #07AB to configure communications to A-B PLCs. Cannot be used with Dual Serial Port Option #0542.



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Allen-Bradley PLC Network Upload/Download (#0524)

This option is a "one-time use" diskette which enables the PanelMate unit to upload and download PanelMate configurations to personal computers via Allen-Bradley PLC networks. Figure C-1 (on the next page) shows the equipment requirements for several communication possibilities. This Upload/Download feature can be used to conduct the following operation without having to disconnect the PanelMate unit from the PLC, or open the enclosure to access the serial ports.

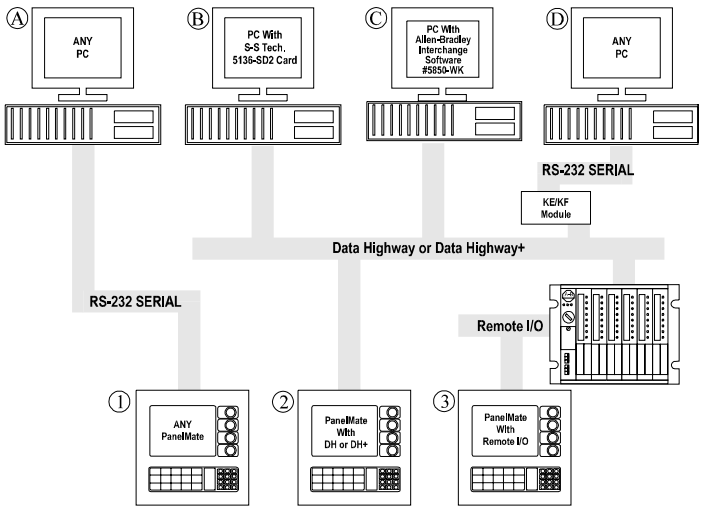
- Download configurations from a personal computer in a central location to PanelMate units on a network
- Upload PanelMate configurations (while units are monitoring and controlling) to a personal computer for backup
- Download new PanelMate software enhancements to target units

Also requires:

- AcceleratI/On interface (#XX41) to be installed in the target PanelMate unit
- Windows Configuration Software or Transfer Utility Option #0621
- A-B PLC driver as part of the Windows Configuration Software Option #0620, #06AB, or #07AB on the personal computer
- A-B Interchange Software Option #0627, if using an A-B 1784-KT (ISA Bus) card in the personal computer



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	PC Requirements	PaneMate Requirements
Ⓐ ➤ ①	Configuration Software or Transfer Utility	None
Ⓑ ➤ ②	1) S-S 5136-SD Card * 2) Conflguratlon Software or Transfer Utllity	1) AcceleratI/On Interface 2) DH or DH+ Drlver Installed 3) Upload/Download Option
Ⓒ ➤ ②	1) A-B 1784-KT Card and 1784-PCMK Card * 2) Configuration Software or Transfer Utility 3) A-B INTERCHANGE™ Software *	1) AcceleratI/On Interface 2) DH or DH+ Driver Installed 3) Upload/Download Option
Ⓓ ➤ ②	1) A-B KE/KF Module * 2) Configuration Software or Transfer Utility	1) AcceleratI/On Interface 2) DH or DH+ Driver Installed 3) Upload/Download Option
Ⓑ ➤ ③	1) S-S 5136-SD2 Card * 2) Conflguratlon Software or Transfer Utllity	1) AcceleratI/On Interface 2) Remote I/O Driver Installed 3) Upload/Download Option
Ⓒ ➤ ③	1) A-B 1784-KT Card and 1784-PCMK Card * 2) Configuration Software or Transfer Utility 3) A-B INTERCHANGE™ Software *	1) AcceleratI/On Interface 2) Remote I/O Driver Installed 3) Upload/Download Option
Ⓓ ➤ ③	1) A-B KE/KF Module * 2) Configuration Software or Transfer Utility	1) AcceleratI/On Interface 2) Remote I/O Driver Installed 3) Upload/Download Option

* Acqulred from thlrd party

Figure C-1 Allen-Bradley Upload/Download

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