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PanelMate Power Series Hardware Installation

(All 120/230VAC Models)

INTRODUCTION

This document contains installation, operation and maintenance information for all 120/230VAC PanelMate Power Series units. The terms PanelMate Power Series and PanelMate unit will be used to describe features common to these 120/230VAC PanelMate models: PanelMate 2000, PanelMate 3000, PanelMate 4000 and PanelMate 5000. Any features unique to a particular PanelMate model will be noted as such.

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

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UNPACKING

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

Report any damage to the carrier who delivered the equipment, then contact your Cutler-Hammer distributor. 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.

PARTS CHECKLIST

The following items are included with your PanelMate unit:

1 PanelMate unit

1 Hardware Installation I.L.

1 Shipping kit (plastic bag) containing:

1 cutout/torque drawing

2 two-terminal connectors

1 three-terminal connector

mounting nuts and washers

Model	Nuts	Washers
PM 2000/3000	(16) #8	(16) #8
PM 4000/5000 Keypad	(18) #10	(18) #10
PM 4000/5000 Split Architecture	(16) #10 (12) #8	(16) #10 (12) #8
PM 4000/5000 Touchscreen	(18) #10	(18) #10

If you ordered any PanelMate Power Series options or accessories, they will be packaged separately.

ENCLOSURE SELECTION

Your PanelMate Power Series unit is designed for NEMA 4 and NEMA 12 installations when properly mounted in a correspondingly-rated enclosure. Some specific models are also rated for NEMA 4X.

Proper installation and enclosure sizing is essential to ensure long life and trouble-free operation. Refer to Cutler-Hammer's PanelMate Power Series Installation Guide for additional installation recommendations. The guide is available on the Cutler-Hammer web site:

www.cutlerhammer.eaton.com/automation

Panel cutout dimensions and steel stud torque limits are shown on the drawing included with your unit.

Enclosure Rating

The front panels of PanelMate Power Series units provide a NEMA 4 or NEMA 12 rating when mounted in a correspondingly-rated enclosure. Some PanelMate models are also rated for NEMA 4X installations. Make sure the enclosure you choose will meet or exceed your application's NEMA rating requirement.

Enclosure Construction

Cutler-Hammer recommends an enclosure constructed of cold rolled steel. This will help guard your unit against electromagnetic interference, as well as provide proper structural support and good heat dissipation.

Enclosure Sizing and Unit Positioning

Careful enclosure sizing is important for proper heat dissipation and easy installation and maintenance. For efficient convection cooling, free space is needed around the PanelMate unit. Convection cooling draws a vertical column of air upward over internal circuitry through the vents in the unit. In all installations, the cooling air must not exceed the maximum specified ambient temperature. This determination must be made for the maximum expected plant temperature (maximum temperature of the air surrounding the enclosure).

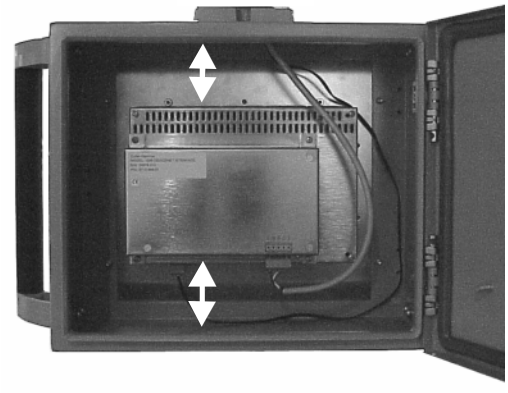
- Avoid mounting other heat-generating equipment near the PanelMate unit. If no other location is available, mount the equipment beside or behind the PanelMate unit. If side/rear space is not available, it is preferable to mount the other equipment above rather than below the PanelMate unit.

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- Maintain recommended free space above and below the PanelMate unit. (see table below)
- Leave room for easy access to circuit boards, wiring/cable connections, and regular maintenance.

PanelMate Power Series Model	Maximum Operating Ambient Temp.	Unit Heat Output	Recommended Free Space Above/Below Unit
2000 Series Grayscale	50°C	188 BTU/hr (55 W)	6" minimum
2000 Series Color	50°C	273 BTU/hr (80 W)	6" minimum
3000 Series Grayscale & Color Dual-scan	40°C	119 BTU/hr (35W)	6" minimum
3000 Series Color TFT	50°C	119 BTU/hr (35W)	6" minimum
4000 Series	50°C	273 BTU/hr (80W)	6" minimum
5000 Series	50°C	137 BTU/hr (40W)	6"minimum

Maintain minimum recommended clearance



If the inside temperature of the enclosure is above the PanelMate unit's recommended range (see table), you must use filtered fans, heat exchangers, or air conditioners to lower the temperature. Because hot air rises to the top of an enclosure, the temperature inside can vary greatly from bottom to top. A fan can be used to circulate air within the enclosure to maintain a more uniform temperature. Make sure the magnetic properties of the equipment used to cool the enclosure do not interfere with your PanelMate unit's operation. CRT monitors are especially susceptible to magnetic fields.

Note: If an air-purged enclosure is used, it is recommended that the inside/outside pressure differential not exceed .5 PSI.

The following sizing table is offered as an aid in the selection of enclosures to be used with PanelMate products. 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 products are beyond our control. For specific information about enclosure selection and cooling methods, contact your enclosure vendor.

PanelMate Model	Enclosure Size	Avg. Internal Temp. Rise
2000 Series Grayscale	24x20x12	10° C
	24x24x12	8.9° C
	30x24x12	7.2° C
2000 Series Color	24x20x12	15° C
	24x24x12	12.8° C
	30x24x12	10.6° C
3000 Series	24x20x8	7.2° C
	24x24x8	6.7° C
4000 Series	30x24x16	9.4° C
	30x24x20	8.3° C
	36x30x16	6.6° C
5000 Series w/keypad	30x24x8	6.° C
	30x24x10	5.6° C
5000 w/touchscreen	24x24x8	7.2° C
	24x24x10	6.7° C
	24x30x8	6.1° C

Note: This table makes the following assumptions:

- Enclosure is fabricated from cold rolled steel.
- All sides of the enclosure are uninsulated.
- Recommended minimum clearance between the unit and the top and bottom of the enclosure.
- No other heat-generating equipment is installed in the enclosure.

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INSTALLING YOUR PANELMATE 2000 IN YOUR ENCLOSURE

Make cutouts in the enclosure as shown on the Cutout/Torque drawing.

1 Go to the back of the unit. Remove AC power and disconnect any other cables

2 Unplug the Display Module video/power cable from the Electronics Module.

3 Remove the Display Module by turning the quarter-turn fasteners counter-clockwise. The Display Module is now disconnected and will slide out.

4 Remove the Electronics Module by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the fasteners, then gently pull the assembly toward you to disengage the front panel keypad connector. Then pivot the assembly down to clear the mounting flange on the front panel.

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

Caution: Care must be exercised when tightening the nuts. Do not exceed recommended 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. 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 Display Module. Slide the Display Module into the front panel tray and ensure the top lid overlaps the front panel lip. Turn the quarter-turn fasteners clockwise to lock. Re-connect the video/power cable from the Display Module to the Electronics Module.

8 Re-connect AC power and cables to the Display and Electronics Modules.

INSTALLING YOUR PANELMATE 3000 IN YOUR ENCLOSURE

Make cutouts in the enclosure as shown on the Cutout/Torque drawing.

1 Go to the side of the unit. Remove AC power and disconnect any other cables

2 Unplug the keypad or touchscreen from the Electronics Module.

3 Remove the Electronics Display Assembly 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.

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

5 **Caution:** Care must be exercised when tightening the nuts. Do not exceed recommended inch-pounds.

6 Re-attach the Electronics Display Assembly by engaging the front slots of the Electronics Display Module on the mounting flange 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 mounting flange. Complete the assembly by turning the captive fasteners clockwise to lock in place.

7 Re-connect the keypad or touchscreen cable.

8 Re-connect AC power and cables.

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INSTALLING YOUR PANELMATE 4000 IN YOUR ENCLOSURE

Make cutouts in the enclosure as shown on the Cutout/Torque drawing.

Note: If you are installing a Model 4200, you will need to complete Steps 6-7. If you are installing a Model 4500. you may skip Steps 6-7.

1 Go to the back of the unit. Remove AC power from both the Electronics Module and the Display Module and disconnect any other cables

2 Unplug the Display Module video cable from the Electronics Module.

3 Remove the Display Module by turning the quarter-turn fasteners counter-clockwise. The Display Module is now disconnected and will slide out.

4 Remove the Electronics Module by turning the quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the 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.

5 From the front, insert the Front Panel in the cutout and fasten it with the #10 washers and nuts that are supplied with the unit.

Caution: Care must be exercised when tightening the nuts. Do not exceed recommended inch-pounds.

STEPS 6-7 for Model 4200 ONLY

6 From inside your enclosure, pass the Keypad Assembly through the Keypad cutout hole. The Electronics module remains inside the enclosure.

7 Fasten the Keypad to the enclosure with the #8 washers and nuts.

8 Re-attach the Electronics Module 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.

9 Re-attach the Display Module. Slide the Display Module into the front panel tray and ensure the top lid overlaps the front panel lip. Turn the quarter-turn fasteners clockwise to lock. Re-connect the video/power cable from the Display Module to the Electronics Module.

10 Re-connect AC power and cables to the Display and Electronics Modules.

Note: If you are unable to complete Steps 7-8 due to space or other restrictions, the keypad cable can be dis-assembled from the Keypad Assembly using the following procedure:

1 Remove the screw securing the cable to the rear of the Keypad Assembly

2 Remove cable clamp, flat washer and star washer.

3 Unplug the keypad cable.

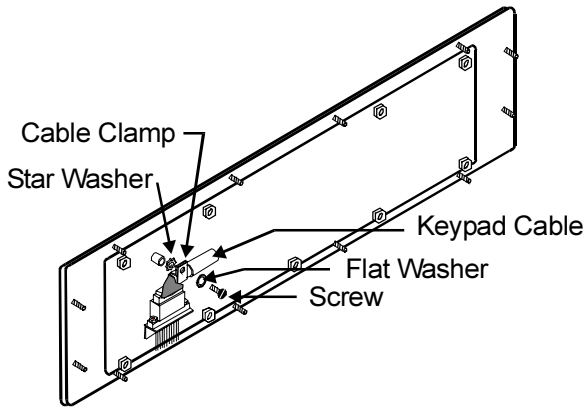
4 From the front of the enclosure, fasten the Keypad to the enclosure with the #8 washers and nuts.

5 Plug the keypad cable into the Keypad Assembly.

6 Place the keypad cable clamp over the braided shield area of the keypad cable.

7 Place the star washer between the Keypad standoff and the keypad cable clamp.

8 Place the flat washer on top of the Keypad clamp and insert/tighten screw.



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INSTALLING YOUR PANELMATE 5000 IN YOUR ENCLOSURE

Make cutouts in the enclosure as shown on the Cutout/Torque drawing.

Note: If you are installing a Model 5200, you will need to complete Step 5. If you are installing a Model 5500. you may skip Step 5.

1 Go to the side of the unit. Remove AC power and disconnect any other cables

2 Touchscreen units: Unplug the touchscreen connector from the Electronics Display Assembly.

Keypad units: Unplug the keypad connector from the Electronics Display Assembly. Unfasten the ferrite block from the unit.

3 Remove the Electronics Display Assembly 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.

4 From the front, insert the Front Panel in the cutout and fasten it with the #10 washers and nuts that are supplied with the unit.

Caution: Care must be exercised when tightening the nuts. Do not exceed recommended inch-pounds.

STEP 5 for Model 5200 ONLY

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

6 Re-attach the Electronics Display Assembly by engaging the front slots of the Electronics Display Module on the mounting flange 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 mounting flange. Complete the assembly by turning the captive fasteners clockwise to lock in place.

7 Touchscreen Units: Re-connect the touchscreen cable.

Keypad Units: Plug the keypad connector into the Electronics Display Assembly. fasten the ferrite to the unit by firmly locking the Velcro pieces together.

8 Re-connect AC power and cables.

SAFETY CONSIDERATIONS

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

WARNING

EXPLOSION HAZARD. SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS1, DIVISION 2.

ADVERTISSMENT

RISQUE D'EXPLOSION. LA SUBSTITUTION DE COMPOSANTS PUET RENDRE CE MATERIAL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE1, DIVISION 2.

WARNING

EXPLOSION HAZARD. DO NOT REPLACE COMPONENTS UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NON-HAZARDOUS.

WARNING

RESQUE D'EXPLOSION. COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT ES DESIGNE NON DANGEREUX AVANT DE REPLACER LE COMPOSANTS.

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CONNECTIONS

120/230VAC Power Connection

The 120VAC power terminals and power switch are located on the Electronics Module.

1 Make sure the rocker switch is in the OFF position

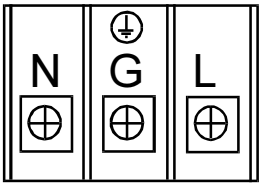
2 Remove the protective cover

3 Connect 120/230VAC with user-supplied wiring. Note: On PanelMate 4000 models, the Display Module and the Electronics Modules require individual power connections.

4 Replace the protective cover over the AC wiring

Note: The PanelMate unit is auto-sensing and will automatically adjust to operate at either 120VAC or 230VAC.

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



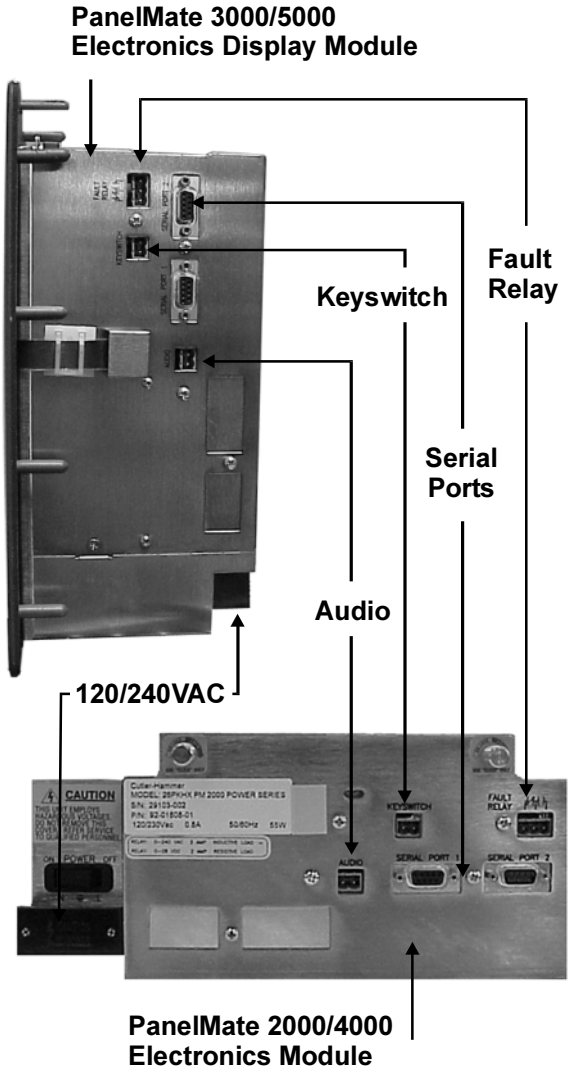
N = Neutral (white wire typical)
⏚ G = Ground (green/yellow wire typical)
L = Line (Hot - black wire typical)

Recommended minimum wire size is 18 AWG

Fault Relay Connection

The fault relay may be wired in normally open or normally closed configuration. It is a Form C contact, rated for 2 amps at 120VAC, 2 amps at 230VAC, and 2 amps at 24VDC resistive load.

During normal operation, the fault relay will energize after entering Run Mode. Whenever the PanelMate unit detects a communications 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 PanelMate Configuration Software Online Help and in the PanelMate Power Series Configuration Software User's Guide for more information.



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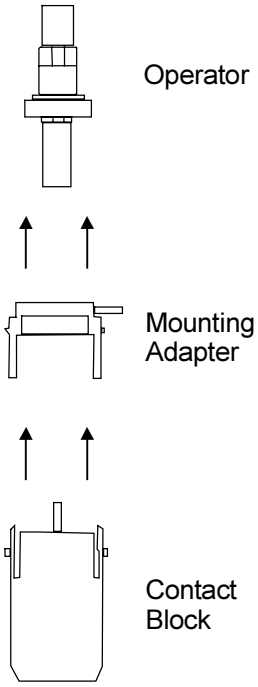
Audio Output

The Audio feedback Kit is an optional accessory available for PanelMate units. To connect the 8 Ohm (2w) external speaker to the PanelMate unit, simply connect the speaker to the “Audio” connector on the PanelMate unit.

Audio output for operator input and alarms is selected in the System Parameters Table. Refer to the System Parameters topic in the PanelMate Configuration Software Online Help and in the PanelMate Power Series Configuration Software User’s Guide for more information.

Security Keyswitch

A security keyswitch can be attached to the PanelMate unit’s electronics module. The keyswitch mounts in a 0.89 inch (22.5mm) hole. The contact block protrudes approximately 2.22 inches (57mm) into an enclosure.



To assemble the keyswitch, push the mounting adapter onto the operator with the white locking lever facing up. Slide the locking lever toward the 1 on the mounting adapter. Connect the contact block to the mounting adapter by squeezing the pads on the top and bottom and push into the mounting adapter. Slide the contact block into slot 1 or slot 2.

Once assembled, you can insert the key and turn clockwise to enable entry. Return to the center position to disable entry and remove the key.

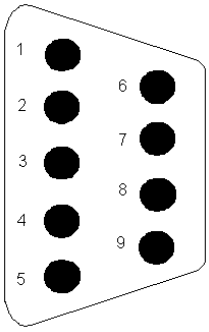
Minimum spacing when mounting with other Cutler-Hammer 22.5mm switches is 1.18 (30mm) center-to-center horizontal spacing and 1.97 inches (50mm) center-to-center vertical spacing.

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

Serial Ports

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 2 may be used for a printer or for PLC (or Host) communications.

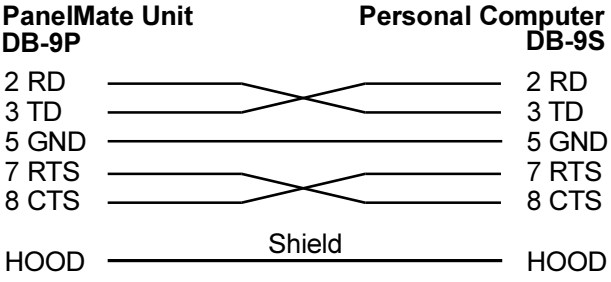
Selection of Port 1 or Port 2 for a serial printer must be done with the PanelMate Configuration Software. Refer to the PLC Name and Port Table topic in the PanelMate Configuration Software Online Help and in the PanelMate Power Series Configuration Software User’s Guide for more information.

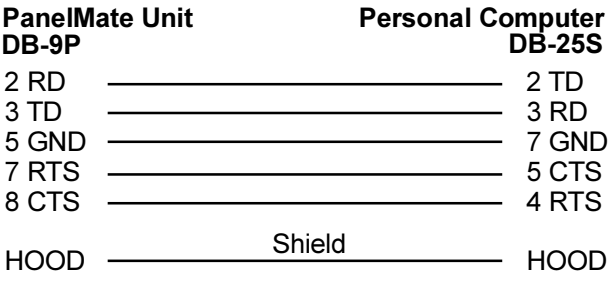


Pin	Description
1	RS422 Transmit Data (+) (Output)
2	RS232 Receive Data (Input)
3	RS232 Transmit Data (Output)
4	RS422 Receive Data (+) (Input)
5	Signal Ground
6	RS422 Transmit Data (-) (Output)
7	RS232 Request to Send (Output)
8	RS232 Clear to Send (Input)
9	RS422 Receive Data (-) (Input)

Connection to a Personal Computer

Executive firmware and PanelMate configurations are uploaded and downloaded to a PC using the PanelMate units serial port. A download serial cable is provided with your PanelMate Power Series Configuration Software. Refer to your PanelMate Power Series Getting Started Manual for more information.





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PANELMATE COMMUNICATIONS

A variety of communication interface options are available for PanelMate Power Series units. Options include:

- RS-232 and RS-422 communications
- RS-485 multi-drop communications
- DeviceNet and Profibus multi-drop communications
- Proprietary PLC networks

Cutler-Hammer does not recommend any specific communications option. Your choice should be based on the requirements of your total control system. The communication option you choose determines the precautions you need to take when installing and connecting your PanelMate unit.

Potential problem areas include:

- Improper grounding of the communications cable, causing excessive radiated emissions.
- Incorrect cable or pinout.
- Failure to maintain minimum/maximum cable lengths between nodes on a communications network.
- Exceeding recommended cable or total network distance.
- Improper or lack of termination on PanelMate units located at the end of a communications network.

For more information on communication options and installation guidelines, refer to the Cutler-Hammer PanelMate Power Series Installation Guide. The guide is available on the Cutler-Hammer web site:

www.cutlerhammer.eaton.com/automation

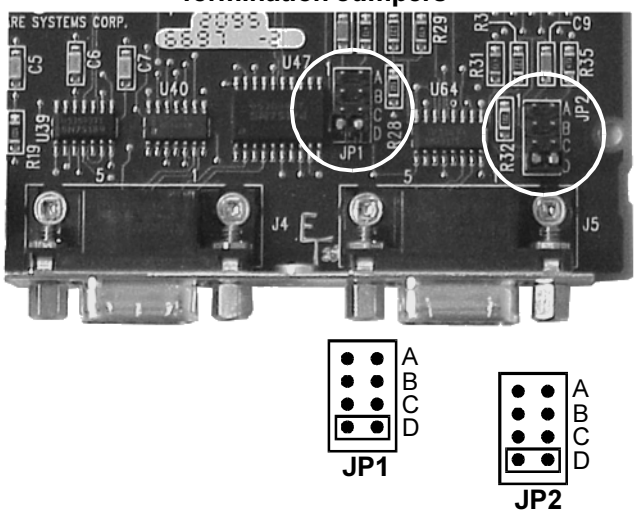
SERIAL PORT TERMINATION

When a PanelMate unit is located at the end of a communications network, it is usually necessary to provide a network termination at the PanelMate unit's serial port. Termination prevents signal reflections that can cause communications errors.

Your PanelMate unit is sent without termination. Jumpers are located on the PanelMate unit's processor board that can be changed to provide various termination resistance values. The table below shows typical settings. For setting the termination on Port 1, configure JP. For setting the termination on Port 2, configure JP2.

Communication Type	Position	Termination
RS-232	D	None (factory setting)
DH-485	A	120 Ohm AC coupled
RS-422/RS-485	B&C	B = 120 Ohm C = 220 Ohm Refer to you PLC communications driver manual for termination information

Termination Jumpers



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RS-232/422/485 Communications

RS-232/422/485 Cable Recommendations:

	Recommended Distance	Recommended Cable
RS-232	Up to 50 feet	24 gauge shielded pair
RS-422	Up to 4000 feet Up to 2000 feet connected to A-B Channel 0	22 gauge shielded pair
RS-485	Up to 4000 feet Up to 2000 feet connected to A-B Channel 0	22 gauge shielded pair

RS-232 Grounding Recommendations:

Grounding of the communication cable shield at both ends will provide the most immunity to high frequency electrical interference. However, the introduction of low frequency interference by high ground currents in the shield may require grounding only one end. Should this approach result in unacceptable high frequency interference, then an RS-422 interface should be considered.

RS-422 Grounding Recommendations:

This balanced interface will operate with common mode DC or peak AC voltages differentials of –7 to +7 volts between grounds at each end of the cable. In cases where the common mode voltage approaches either extreme, the system may operate properly when the shield is grounded at only one end of the cable. However, this arrangement will make the system susceptible to high frequency interference. If the systems will not operate properly due to high frequency interference and grounding the cable shield at both ends is ineffective, then total isolation must be considered or eliminate ground potentials in your plant.

RS-232/422/485 Shielding Recommendations:

Application: *Short or Long Runs in LOW or HIGH Noise Environment with INSIGNIFICANT Levels of Low Frequency Ground Differential Voltage Between Connected Units*

A good quality shielded cable consisting of twisted pairs for the required communication wires and logic common is recommended. An unshielded line is not recommended because the unshielded connectors may act as an antenna resulting in radiated emissions that may exceed the CE required limit. Additionally, shielded cable provides greater ESD protection. The shield should be connected directly to the chassis of the interconnected units at both ends. The connector housing should contact the cable shield uniformly around the entire 360-degree periphery of the housing cable entry opening. Never connect the shield by way of a drain wire pigtail unless absolutely necessary. If a pigtail is required, the shield should be terminated as close as possible to the connector to minimize the pigtail length.

Application: *Short or Long Runs in LOW Noise Environment with HIGH Levels of Low Frequency Ground Differential Voltage Between Connected Units*

A good quality shielded cable consisting of twisted pairs for the required communication wires and logic common is recommended. The shield should be connected directly to the chassis of one of the interconnected units (one end only). Never connect the shield by way of a drain wire pigtail unless absolutely necessary. If a pigtail is required, the shield should be terminated as close as possible to the connector to minimize the pigtail length.

Application: *Short or Long Runs in HIGH Noise Environment with HIGH Levels of Low Frequency Ground Differential Voltage Between Connected Units*

A good quality shielded cable consisting of twisted pairs for the required communication wires and logic common is recommended. The shield should be connected directly to the chassis of one of the interconnected units and ac-coupled through a 0.01 μf capacitor at the other end to the chassis of the second unit. The connector housing should contact the cable shield uniformly around the entire 360-degree periphery of the housing cable entry opening. Attaching the capacitor at the ac-coupled end will require some ingenuity to achieve a secure connection at both the shield and chassis while keeping the capacitor lead length as short as possible.

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Proprietary and Open Network Communications

Network Cable Recommendations:

Network Type	Recommended Distance	Recommended Cable
A-B DH-485	Up to 4000 feet	Beldon 9842
A-B DH(+)	Up to 10,000 feet at 57.6kbaud Shorter lengths at higher baud rates	Beldon 9463
A-B Rem I/O	Up to 10,000 feet at 57.6kbaud Shorter lengths at higher baud rates	PVC Twinaxial
DeviceNet	Up to 1640 feet at 125Kbaud	Refer to your C-H DeviceNet Installation Guide
GE Fanuc Genius I/O	Up to 7,500 feet at 38.4kbaud Shorter lengths at higher baud rates	Refer to Genius I/O User's Manual
Modicon Modbus Plus	Up to 7,500 feet at 38.4kbaud Shorter lengths at higher baud rates	Refer to Modbus Plus User's Manual
Profibus DP	Up to 3278 feet at 93.7Kbaud	22 gauge shielded pair

Network Installation Tips:

- Verify the network is terminated. Most networks require termination at both ends of the network to eliminate problems associated with reflected signals. Resistor value varies by network type – refer to your network User's Manual.
- Be certain to maintain minimum/maximum cable lengths between nodes. Refer to your network User's Manual for requirements.
- Daisy chained networks are preferred, but trunkline/drop line is acceptable. Most networks do not support star or tree configurations, and they are not recommended for use with a PanelMate unit.
- Be certain to remain within the maximum number of nodes allowed on your network.

Profibus DP Shielding Recommendations

A good quality shielded cable consisting of twisted pairs for the required communication wires and logic common is recommended. An unshielded line is not recommended because the unshielded connectors may act as an antenna resulting in radiated emissions that may exceed the CE required limit. Additionally, shielded cable provides greater ESD protection. The shield should be connected directly to the chassis of the interconnected units at both ends. The connector housing should contact the cable shield uniformly around the entire 360-degree periphery of the housing cable entry opening. Never connect the shield by way of a drain wire pigtail unless absolutely necessary. If a pigtail is required, the shield should be terminated as close as possible to the connector to minimize the pigtail length.

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PANELMATE OPERATION

The most basic job of a PanelMate unit is to replace the functions of traditional hard-wired operator station devices such as pushbuttons, lamps and message displays. To replace each category of hard-wired devices, the PanelMate unit supplies a specific visual tool or “template” which can be arranged onscreen with other templates.

During operation, you can select a template to “arm” control buttons or numeric entry. Once a template has been selected or “armed”, you can press any desired control button to take action

For more information on PanelMate online operation, refer to your PanelMate Power Series Getting Started user’s Guide or PanelMate Power Series Online Operation User’s Guide.

Touchscreen Operation (touchscreen models only)**:**

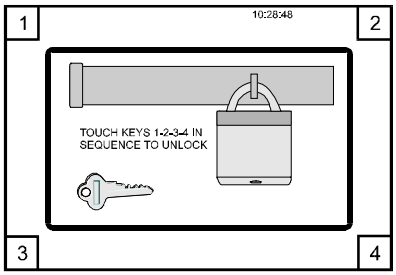
Your PanelMate unit’s touchscreen is designed for finger or gloved operation only. Touchscreen activation does not require the same actuation force as a mechanical switch. A light touch will produce the same result as a heavy one.

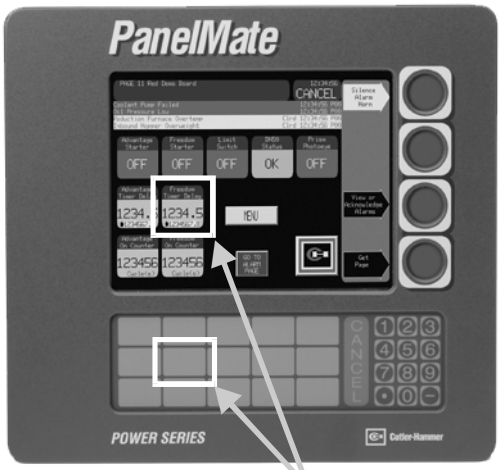
Touchscreen Cleaning (touchscreen models only)**:**

Your PanelMate unit is equipped with a Cleaning Mode utility to make touchscreen cleaning safe and easy. To access the Cleaning Mode screen:

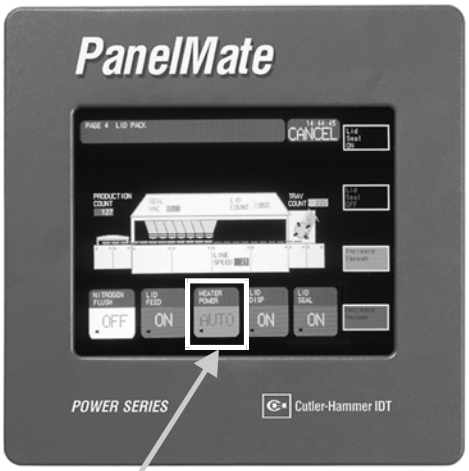
1 Place the PanelMate unit is Run Mode.
2 Select the **Get Page** control button from the default control buttons.
3 Select the **More** control button.
4 Select the **Setup Page** control button
5 Select the **Cleaning Mode** template**.**
6 Press the **Execute** control button

After pressing the Execute button, the Cleaning Mode screen will appear. While this screen is displayed, the touchscreen will not respond to your tough. After you have finished cleaning the touchscreen, you must return to normal operation by pressing the screen’s numbered corners in sequential order: 1,2,3,4.





On Keypad units, pressing on the "TouchPanel" activates the template in the corresponding area of the display.



On Touchscreen units, pressing directly on the display will activate a template.

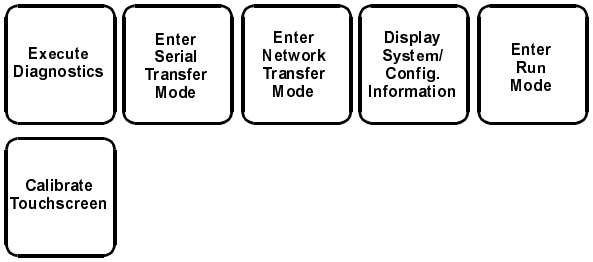
CAUTION

NEVER USE FOREIGN OBJECTS (PENS, SCREWDRIVERS OR SIMILAR) TO ACTIVATE THE TOUCHSCREEN, TOUCHPANEL, NUMERIC ENTRY PAD OR CONTROL BUTTONS. FOREIGN OBJECTS MAY DAMAGE THE TOUCHSCREEN OR MEMBRANE SURFACES, CAUSING UNRELIABLE OPERATION OR FAILURE.

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PANELMATE DIAGNOSTIC TESTS

When power is applied to you PanelMate unit, the unit will display a listing of internal diagnostic checks as they are executed. After completing its internal diagnostic checks, the unit will display the Offline Mode Menu. This menu displays six selections described below:



Execute Diagnostics

This template allows you to perform a series of tests:

- Set Date and Time
- Display test
- Keypad/Touchscreen test
- Tone, relay and battery test
- Serial port test

For information on performing these tests, refer to your PanelMate Power Series Getting Started Manual.

Enter Serial Transfer Mode

To download, upload or read system information over a serial port, your PanelMate unit must be in Serial Transfer Mode. For more information on downloading and uploading PanelMate Power Series configurations, refer to your PanelMate Power Series Getting Started Manual.

Enter Network Transfer Mode

Network transfer mode is used to read system information over a remote network or remotely place your PanelMate unit into Run Mode. For more information, refer to your PanelMate Transfer Utility User's Manual.

Display System Configuration Information

This selection displays your PanelMate unit's current configuration. Your PanelMate unit is shipped with a demonstration PanelMate Power Series configuration. Once you have downloaded a new configuration, this information will be updated to reflect the new configuration information.

Enter Run Mode

Run Mode allows you to display the configuration downloaded to the PanelMate unit and communicate to the PLC of your choice. If a new configuration has not been downloaded, the unit will display the demonstration configuration. For more information on Run Mode, refer to your PanelMate Power Series Getting Started Manual.

Calibrate Touchscreen

Touchscreen units have a calibration routine that must be performed to determine the boundaries of the video on your touchscreen. Refer to PanelMate Adjustments for instructions on calibrating the touchscreen.

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PANELMATE ADJUSTMENTS

Depending on the PanelMate model, you may have 1 or more adjustments to ensure optimal performance.

PanelMate 2000 Grayscale Display Adjustments

Display adjustments are located on the rear of the Display module. A Philips head screwdriver is needed.

Contrast: Turing the control will increase or decrease the contrast of the screen.

Brightness: Turing the control will increase or decrease the brightness of the screen. This should be the first control checked if no image appears on the display.

PanelMate 2000 Color and PanelMate 4000 Display Adjustments

Display adjustments are located on the rear of the Display module. A Philips head screwdriver is needed.

Contrast: Turing the control will increase or decrease the contrast of the screen.

Brightness: Turing the control will increase or decrease the brightness of the screen. This should be the first control checked if no image appears on the display.

H-Posi: The H-Posi control will adjust the horizontal location of the display.

V-size: The V-size control will increase or decrease the vertical size of the display.

PanelMate 3000 Display Adjustments

PanelMate 3000 units with Grayscale or Color Dual-Scan displays have software-controlled contrast adjustment. To adjust the contrast, follow these steps:

1 Place the PanelMate unit is Run Mode.
2 Select the **Get Page** control button from the default control buttons.
3 Select the **More** control button.
4 Select the **Setup Page** control button
5 Select the **Adjust Contrast** control button and use the Lighter and Darker control buttons to adjust the display's contrast.
6 To save the new setting, Press the **Save Setting** control button.

Note: PanelMate 3000 models with Color TFT displays are self-adjusting and do not require user adjustments.

PanelMate 5000 Display Adjustments

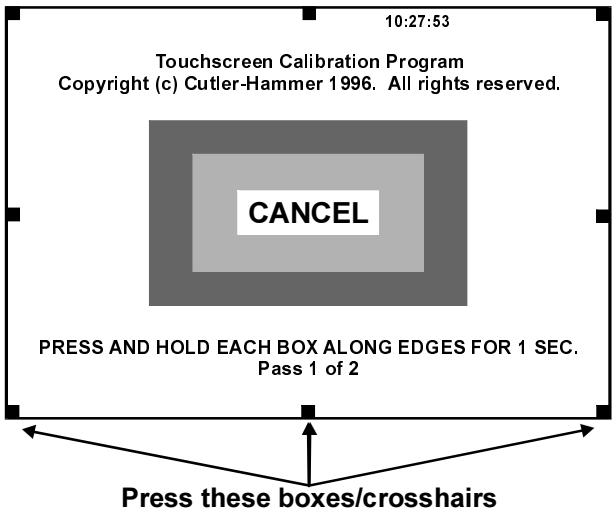
All PanelMate 5000 models are self-adjusting and do not require user adjustments.

Touchscreen Calibration (all touchscreen models)

You can calibrate your PanelMate unit's touchscreen in both Offline and Run Modes. To access the Calibration screen when in Offline Mode, select the Calibrate Touchscreen template on the Offline Mode Menu. To access the calibration screen in Run Mode:

1 Place the PanelMate unit is Run Mode.
2 Select the **Get Page** control button from the default control buttons.
3 Select the **More** control button.
4 Select the **Setup Page** control button
5 Select the **Calibrate Touchscreen** control button
6 Press the **Execute** control button

Although the Offline and Run Mode calibration screens are slightly different in appearance, they both use the same calibration process. To calibrate, press the eight boxes/crosshairs located around the edges of the display. You may press the boxes/crosshairs in any order, but all must be pressed to calibrate.



Each box/crosshair will turn green (different shade of gray on grayscale units) when pressed. After the first pas, the boxes/crosshairs will turn red (to the original shade of gray on grayscale units) again to indicate that the screen is ready for the second pass. Again, press all eight boxes/crosshairs around the edge of the screen. When you have pressed the last, the unit will return to normal operation.

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PRODUCT SPECIFICATIONS

		PanelMate 2000	PanelMate 3000	PanelMate 4000	PanelMate 5000
Temperature	Operating	0º to 50ºC	0º to 40ºC (Dual-scan) 0º to 50ºC (TFT)	0º to 50ºC	0º to 50ºC
	Non Operating	-20º to 65ºC	-20º to 60ºC	-20º to 65ºC	-20º to 60ºC
Humidity		20-90% Noncondensing (Gray) 20-95% Noncondensing (Color)	20-95% Noncondensing	20-95% Noncondensing	20-95% Noncondensing
Shock	Operating	10g	15g	10g	30g
	Non Operating	20g	30g	20g	30g
Altitude	Operating	Sea level to 10,000'l	Sea level to 10,000'l	Sea level to 10,000'l	Sea level to 10,000'
	Non Operating	Sea level to 30,000'	Sea level to 30,000'	Sea level to 30,000'	Sea level to 30,000'
Power		55W (Grayscale) 80W (Color)	35W	30W Electronics Mod. 50W Display Mod.	40W
Frequency		50/60Hz,+/- 5%	50/60Hz,+/- 5%	50/60Hz,+/- 5%	50/60Hz,+/- 5%
Current		0.8A (Grayscale) 1.0A (Color)	0.5A	0.3A Electronics Mod. 0.7A Display Mod.	0.5A
Peak Inrush Current		16A max (Grayscale) 25A max (Color)	16A max	16A max Electronics Mod. 16A max Display Mod.	15A max
Weight		23 lbs. (Grayscale) 32 lbs (Color)	18 lbs.	55 lbs.	25 lbs.
Equipment Heat Output		188 BTU/hr (Grayscale) 273 BTU/hr (Color)	119 BTU/hr	273 BTU/hr	137 BTU/hr

ESD Immunity:
Air: IEC 1000-4-2, Level 4 (+/-15kV)
Contact: IEC 1000-4-2, Level 4 (+/-8kV)

Radiated Immunity: IEC 1000-4-3 (10V/m) 27MHz to 1GHz 80% AM modulation

Conducted Immunity: IEC 1000-4-6 10V from 150kHz to 80mHz, 80% AM modulation with 1kHz sine wave

Surge Immunity: IEC 1000-4-5 2kV

Radiated/Conductive Emission: CISPR 22, Class A

Electrical Fast Transient: IEC 1000-4-4 Level 3 (2kV) on power lines (1kV) on I/O lines

Line Frequency Magnetic Field Immunity: IEC 1000-4-8 Level 3, 30A/m at 50Hz and 60 Hz

Pollution: Pollution Degree 1 – Rated for exposure to dry or non-conductive pollutants only

Serial Port Rate: Selectable; 110 to 38,400 baud

Serial Port Configuration: DB9S connection selectable for RS232, RS422, or RS 485-2 signal levels

Voltage: 120/230VAC, -15%/+10% Autosensing

NEMA Rating: NEMA 4, 12 when mounted in a correspondingly-rated enclosure. NEMA 4X on stainless steel models

Vibration:

PanelMate 2000:
Operating: 10-57Hz at 0.006 inch peak to peak displacement. 57-500Hz at 1g acceleration
Non-operating: 10-57Hz at 0.015 inch peak to peak displacement. 57-500Hz at 2.5g acceleration

PanelMate 3000:
Operating: 10-500Hz at 1g Non-operating: 10-500Hz at 1g

PanelMate 4000:
Operating: 10-57HZ at 0.006 inch peak to peak displacement. 57-500Hz at 1g acceleration
Non-operating: 10-57HZ at 0.015 inch peak to peak displacement. 57-500Hz at 2.5g acceleration

PanelMate 5000:
Operating: 10-500Hz at 1g Non-operating: 10-500Hz at 1g

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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.

Technical Support Fax 614-882-0417

You can also contact our technical support engineers by faxing your support requests directly to the Advanced Product Support Center (APSC) located in Westerville, Ohio at 614-882-0417.

Information Fax-Back Service 614-899-5323

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

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

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E-mail chatechsupport@ch.etn.com

If you have Internet capabilities, you also have access to technical information via our website at http://www.cutlerhammer.eaton.com/automation. The website includes technical notes, frequently asked questions, release notes, and other technical documentation. Technical support messages and files can be sent to chatechsupport@ch.etn.com.

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