MANUAL – INSTALLATION

Touchscreen Room Pressure Monitor

PMT Series

Issue Date: 11/09/16

Firmware Version: v1.4.0 / CARD v3.1.0

price® | CRITICAL CONTROLS

TOUCHSCREEN ROOM PRESSURE MONITOR

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TECH TIP ▼

Short circuit or incorrect wiring may permanently damage the controls or other equipment. Ensure proper wiring practices. The PMT is a 24 VAC device. Do not apply any voltage above 24 VAC to device.

Technical Support

1-866-884-3524
criticalcontrols@priceindustries.com
www.pricecriticalcontrols.com

TOUCHSCREEN ROOM PRESSURE MONITOR

PRODUCT OVERVIEW

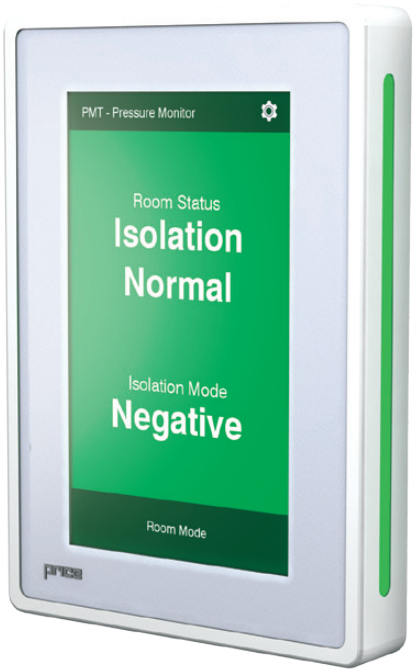
General

The Touchscreen Room Pressure Monitor (PMT) provides precise room pressure monitoring for critical spaces such as isolation rooms, operating rooms, and compounding pharmacies. The monitor meets both the ASHRAE 170 Healthcare Ventilation Standard and the USP 800 and USP 797 Hazardous Drugs - Handling in Healthcare Settings requirements. Using an innovative contamination resistant pressure sensor, the PMT can accurately measure room pressure without risk of degradation over time. The PMT utilizes native BACnet MS/TP communication to seamlessly connect into your Building Management System. The touchscreen monitor is BTL certified, providing simple and dependable network integration.

PMT Specifications

- **Dimensions:** 3.61 x 5.00 x 1.45 in. (91.75 x 127.00 x 36.86 mm)
- **Display Type:** Capacitive Touch, 4.3 in. (109 mm) TFT/IPS, Dimmable
- **Resolution:** WVGA RGB 480px x 800px
- **Range:** -0.1 to 0.1 in.w.c. (-25 to 25 Pa)
- **Accuracy:** 3% of reading +/- 0.0008 in.w.c. (0.02 Pa)
- **Input Power:** 24 VAC +/- 10%, 50/60 Hz, Maximum 15 VA, Class 2. Maximum 3 units per transformer
- **Environmental (operating):** 50°F to 95°F (10°C to 35°C), 0% to 95% R.H. (non-condensing)
- **Environmental (storage):** -22°F to 122°F (-30°C to 50°C), 0% to 95% R.H. (non-condensing)
- **Inputs:** 1 binary input, 1 binary/ analog input
- **Outputs:** 2 Analog outputs (0 to 10 VDC, max: 10mA) 1 dry binary output (max: 24 VAC/VDC, 100mA)
- **Communication Protocol:** BACnet® MS/TP

FRONT DISPLAY ▼



BACK OF UNIT ▼

TOUCHSCREEN ROOM PRESSURE MONITOR

PRODUCT OVERVIEW

Included in Package

1. Touchscreen Room Pressure Monitor (PMT)
   Quantity: 1
2. Room Pressure Sensor (RPS). Includes main sensor and reference sensor.
   Quantity: 1
3. Kink resistant air tubing –18"
   Quantity: 1
4. Plenum rated green 25 foot (RJ-12) cable
   Quantity: 1
5. Gang drywall mounting bracket
   Quantity: 2
6. Packet containing four slot screws
   Quantity: 2
7. Quick Start Guide
   Quantity: 1

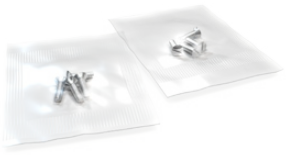
Please ensure you have all components before proceeding. Inspect components for shipping damage. Do not install any components that appear damaged, contact your local Price Sales Representative for quick ship replacements.

INCLUDED ITEMS ▼

1. TOUCHSCREEN ROOM PRESSURE MONITOR (PMT)

5. GANG DRYWALL MOUNTING BRACKET (2)

2. ROOM PRESSURE SENSOR (RPS)



6. PACKET CONTAINING FOUR SLOT SCREWS (2)

3. KINK RESISTANT AIR TUBING – 18"

7. QUICK START GUIDE

4. PLENUM RATED GREEN 25 FOOT (RJ-12) CABLE

PRODUCT OVERVIEW

Optional Accessories

Key Switch

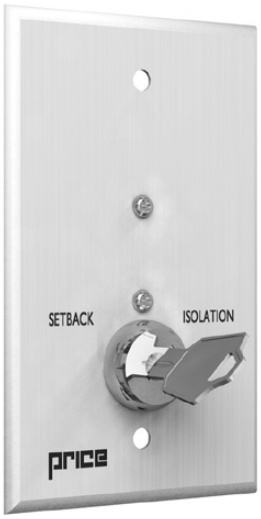
The PMT has an option for a remote Room Mode Key Switch that can change the room mode to Isolation or Setback. Please ensure you have the correct key switch for your isolation room.

NOTE: Due to the unpredictable location of the key switch wiring/cabling done by others, it is recommended that a 18-22 AWG copper 2 conductor plenum rated wire be used. The maximum distance the key switch can be mounted from the PMT monitor is 100 feet.

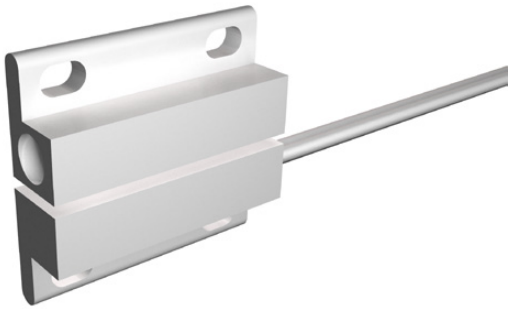
Door Switch

A door switch can be wired into the binary input(s) to detect when the door(s) are open. Door switches are available in either surface mount or flush mount.

ROOM MODE KEY SWITCH ▼



SURFACE MOUNT MAGNETIC DOOR SWITCH ▼



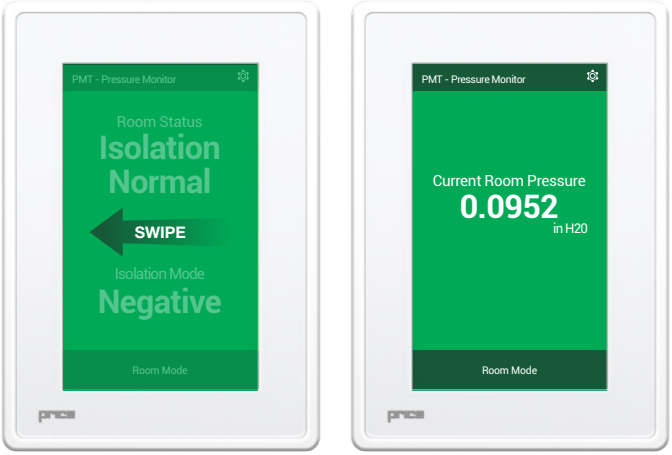
FLUSH MOUNT MAGNETIC DOOR SWITCH ▼

TOUCHSCREEN ROOM PRESSURE MONITOR

PRODUCT OVERVIEW

Functionality

The PMT is designed to provide ease of use pressure monitoring.



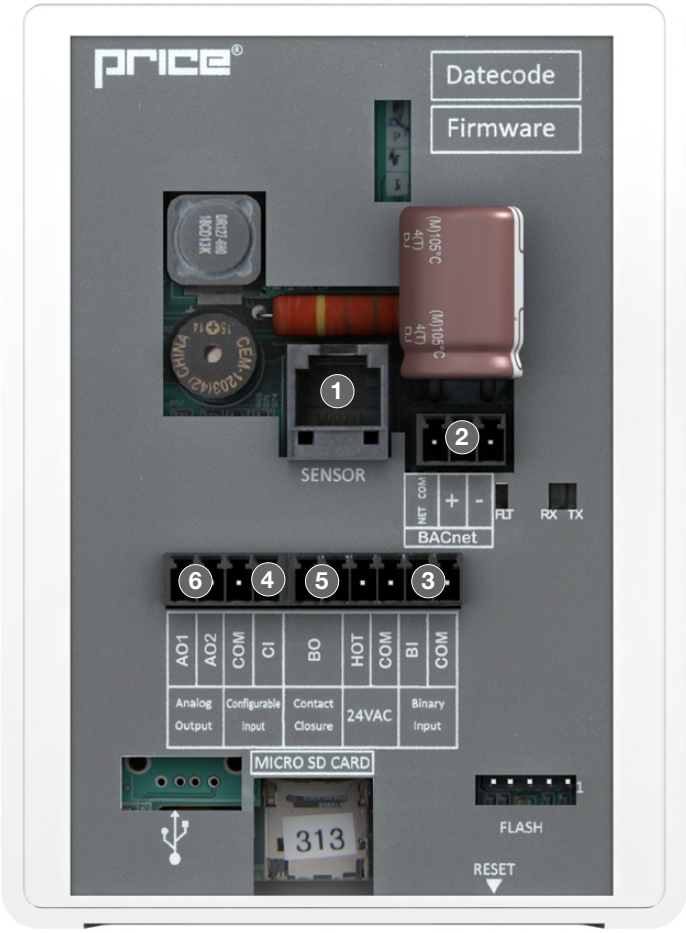
The PMT Home Screen provides monitoring information in a simple format displaying information including Room Status and Isolation Mode.

Upon swiping the screen to the left, room pressure measurement is visually available.

Features

1. Password protected menus.
2. Setup Wizard - Walk through setup of PMT when first powered up.
3. LED side bars offer 180˚ viewing of current room status.

Using its various inputs and outputs, users are able to customize the device to suit their application.

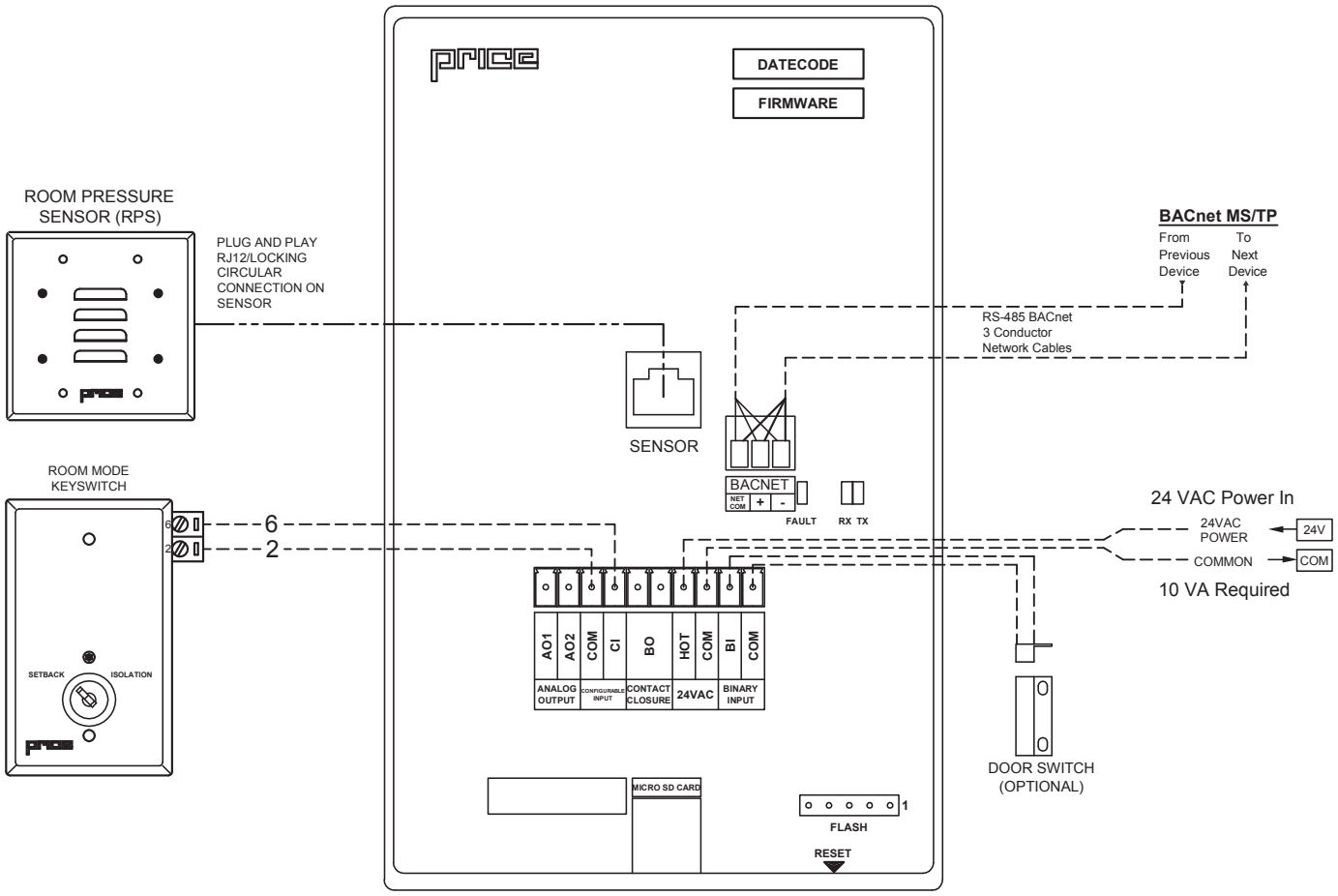


1. The PMT connects to the Room Pressure Sensor through this RJ-12 connector. Standard cable length is 25 ft.
2. The PMT has native BACnet capabilities, connection is made through this BACnet MS/TP terminal.
3. The Binary Input can be used to trigger setback, isolation, alarms or cautions. Used in conjunction with the Configurable Input, the user is afforded full control.
4. The Configurable Input is typically used for the Room Mode Key Switch, however it has the same capabilities as the Binary Input.
5. The Contact Closure allows the user to provide a 24 VAC/VDC signal on a variety of inputs.
6. The PMT's two Analog Outputs allow the user to provide a configurable 0 to 10 VDC signal on a variety of inputs.

TOUCHSCREEN ROOM PRESSURE MONITOR

PRODUCT OVERVIEW

Sample Wiring Diagram



TOUCHSCREEN ROOM PRESSURE MONITOR

INSTALLATION & MOUNTING INSTRUCTIONS

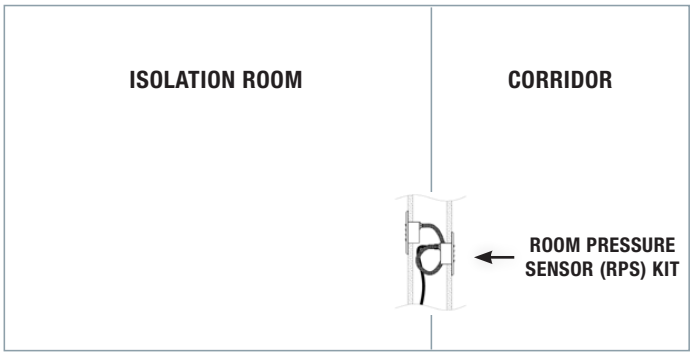
Single Isolation Room

Ensure you have all components necessary for installation. Inspect components for signs of shipping/handling damage. Do not proceed if you suspect any components are damaged.

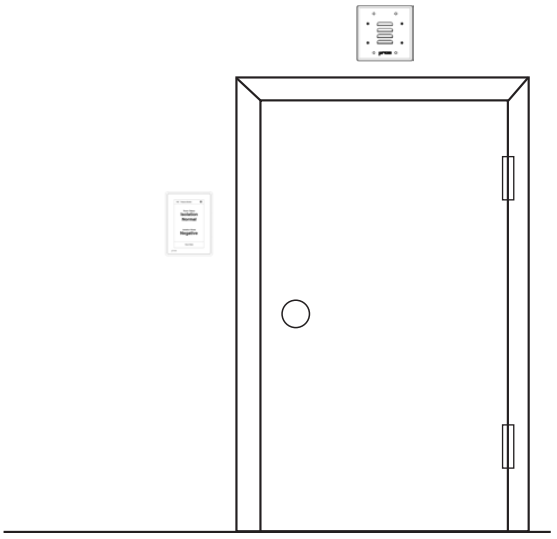
1. Mount the Touchscreen Room Pressure Monitor (PMT) near the doorway using a standard single-gang electrical box (by others) at a height of 5 feet. **Ensure LED bars are not blocked by other devices on wall.** The PMT will come equipped with a 0.050" Allen key for the set screw at the bottom.
2. Install the Room Pressure Sensor (RPS) assembly. The RPS – Main Sensor should be installed in the corridor using the drywall bracket supplied. The RPS – Reference Sensor **must be installed within 12 inches of the Main sensor.** The pressure sensor should typically be located above a doorway away from any turbulent airflow.

   NOTE: The Main Sensor has a black cable connector and brass pressure tap, while the Reference Sensor only has a brass pressure tap.

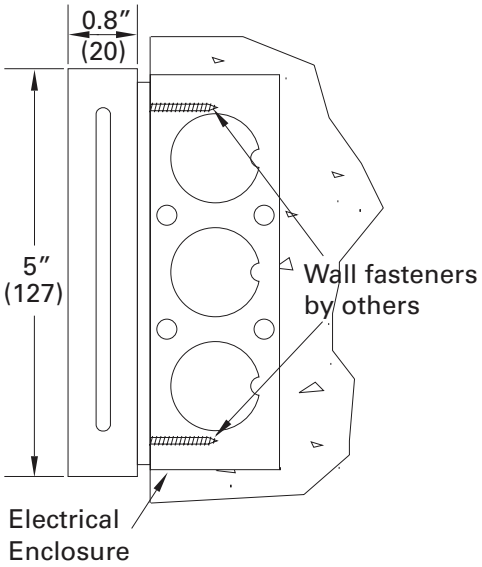
PMT MONITORING ISOLATION ROOM REFERENCED TO CORRIDOR ▼

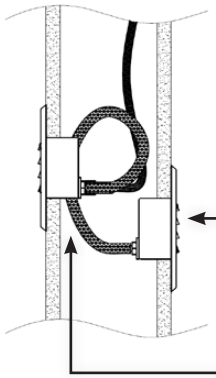


INSTALLATION EXAMPLE ▼



SURFACE MOUNT DETAIL ▼





RPS - Reference Sensor Assembly – Mounted in Isolation room. Firmly attach the supplied kink resistant air tubing to the pressure tap.

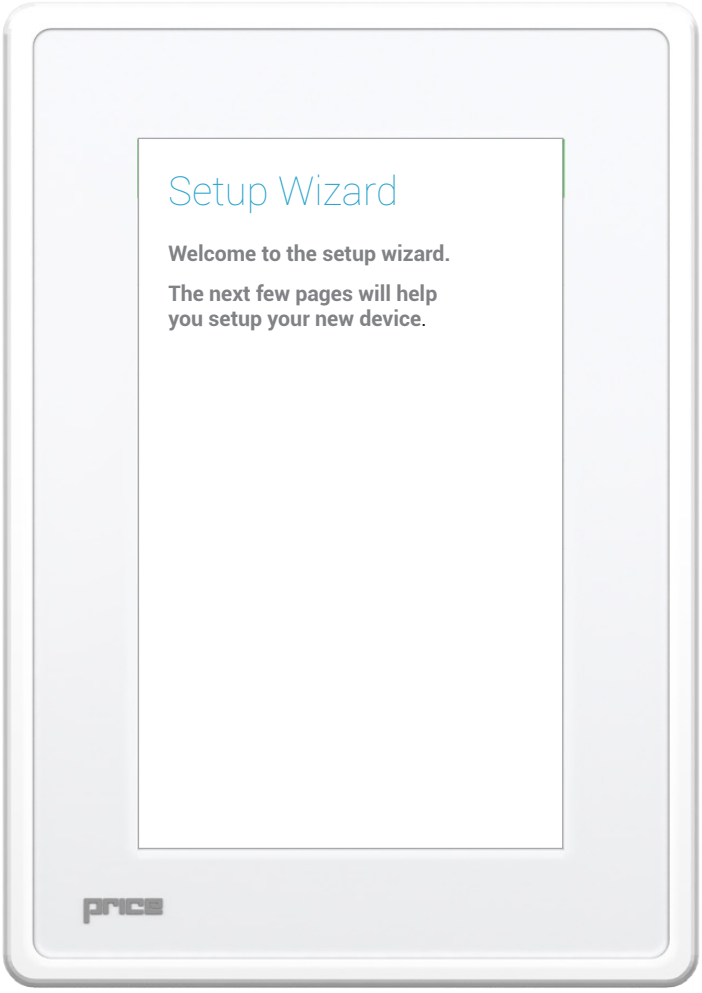
RPS - Main Sensor Assembly – Mounted in corridor/hallway. Gently plug the green c25 cable end to the black connection on back. Route the RJ-12 connection end back to the PMT. Plug into black RJ-12 jack. Firmly attach the supplied kink resistant air tubing to the pressure tap.

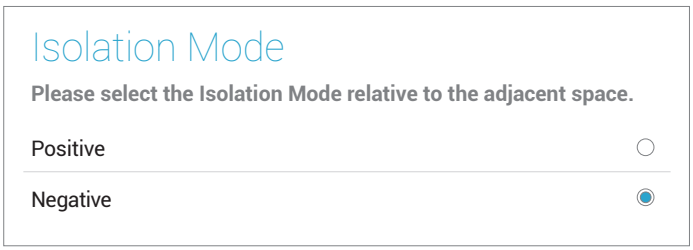
TOUCHSCREEN ROOM PRESSURE MONITOR

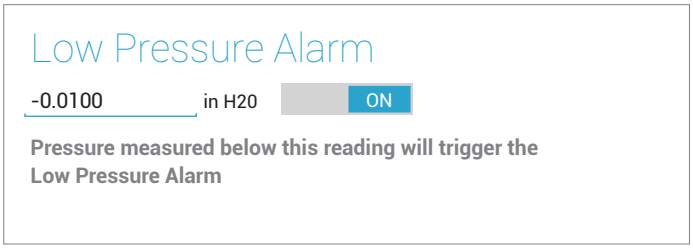
DISPLAY NAVIGATION

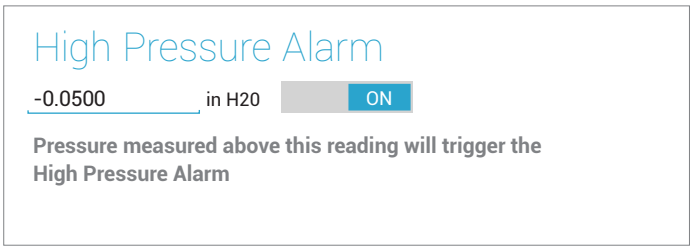
Initial Setup

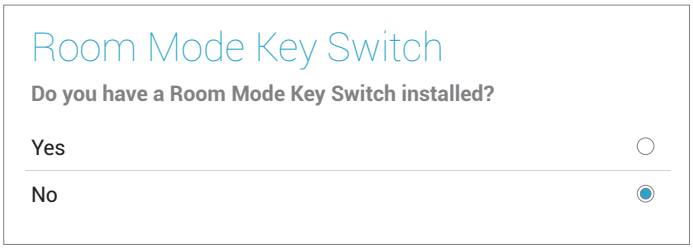
When the PMT is first powered on, it will prompt the user to step through a Setup Wizard to help configure the device. The following menus will be displayed. At any point in the device setup the user is able to access previous selections in the menu. Any value not initially configured in the Setup Wizard can be configured through the Settings in normal operation.

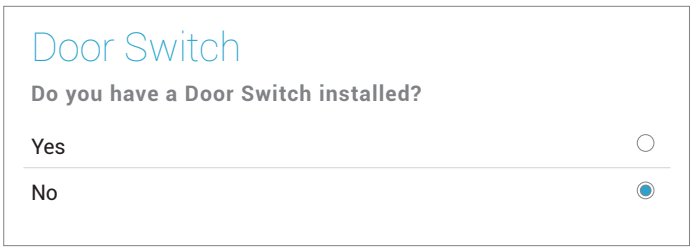


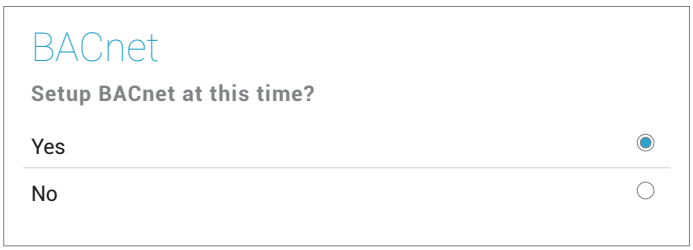






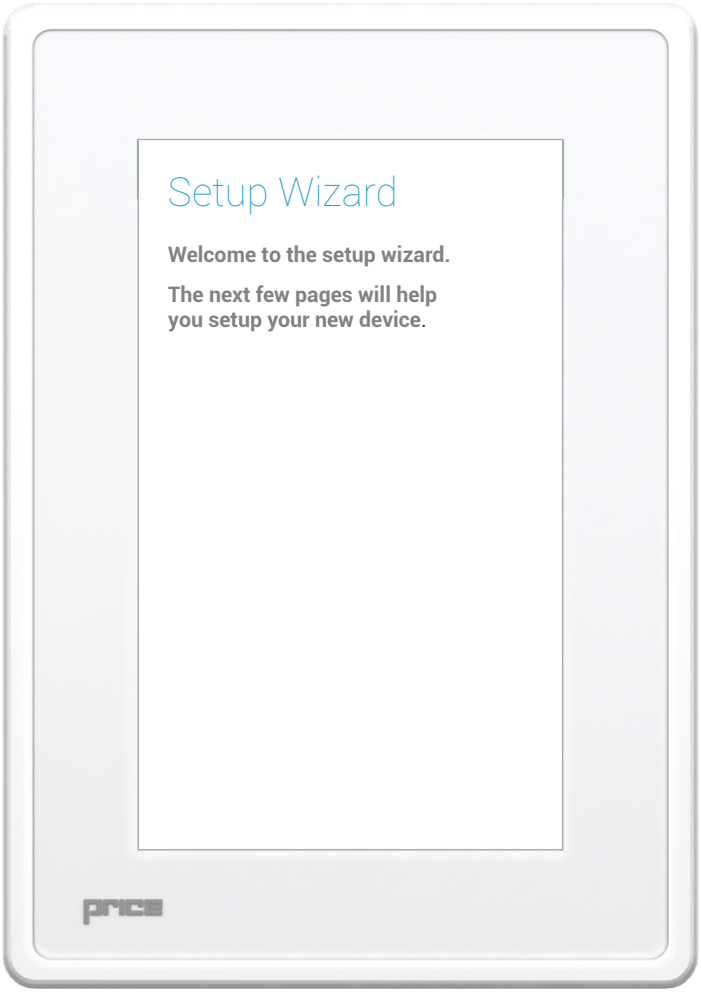






TOUCHSCREEN ROOM PRESSURE MONITOR

DISPLAY NAVIGATION



MAC Address

1

Device Instance

158001

Baud Rate

9600	○
19200	○
38400	○
76800	◉

Review

Scroll to see complete list

ISOLATION MODE	Negative
LOW PRESSURE ALARM	-0.0100
HIGH PRESSURE ALARM	-0.0500
ROOM MODE KEY SWITCH	No
DOOR SWITCH	No
BACNET	Yes
MAC ADDRESS	1

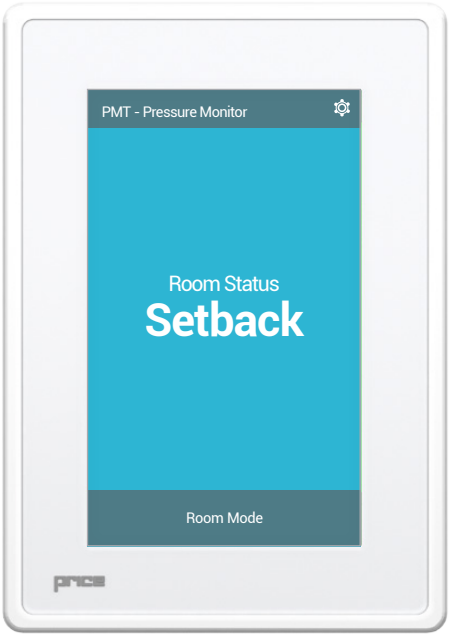
TOUCHSCREEN ROOM PRESSURE MONITOR

DISPLAY NAVIGATION

Home Screen

The PMT Home Screen displays once the PMT Setup Wizard has been completed.
The Home Screen provides the user with a clear indication of the monitor mode, status, and pressure reading.

1. **Monitor Name** – The current name of the monitor is displayed. This is configurable (see User Preferences).
2. **Settings Button** – Allows access to settings. This is password protected. Password: 1-6-6-4.
3. **Room Status** – Indicates whether the room is maintaining the desired setpoints in its current mode.
4. **Isolation Mode** – Indicates whether the room is in Negative or Positive Isolation mode.
5. **Room Mode** – Allows the user to select between Isolation and Setback modes. When a Room Mode Key Switch is installed, this option will be disabled on the PMT Home Screen. This ensures that control is maintained from only one location, and ensures that the key switch will always match the room mode. This is password protected, however the password is configurable (see User Preferences). Default password: 1-2-3-4.



Once in Setback mode, the PMT will continue to monitor room pressure, however all alarms will be disabled. The Home Screen will only show the room status.

DISPLAY NAVIGATION

PMT Operation

When fully setup the PMT can be set to monitor positive or negative pressure. Alarms for low / high pressure are fully field configurable. The PMT has four Room Status Conditions:

Mode	Status	LCD Display	LED Bars	Alarm
Negative/Positive Pressure Monitoring (Room Occupied)	Normal - Pressure reading within low / high set points		Green	Off
Negative/Positive Pressure Monitoring (Room Occupied)	Alarm - Pressure reading outside low / high caution set points		Yellow	Off
Negative/Positive Pressure Monitoring (Room Occupied)	Alarm - Pressure reading outside low / high alarm set points		Red	On
Neutral (Room Setback)	Setback - Pressure measured but no alarms		Blue	Off

When occupied, the PMT will monitor and display the primary room pressure. If the pressure reading is within the low and high alarm set points, the LED bars will be green and the alarm will be off. If the pressure reading is outside of either the low or high alarm set points the LED bars will turn red and the local alarm will turn on.

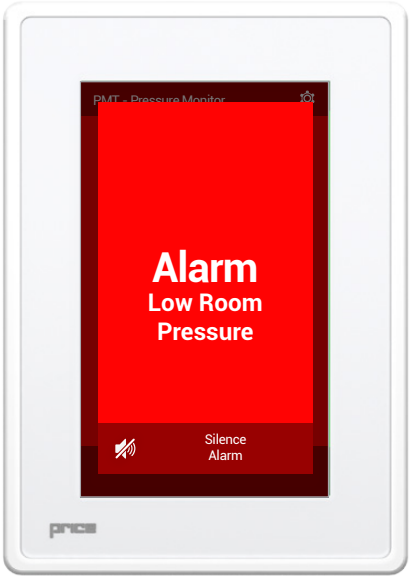
Alarm Silence

Used to temporarily mute the local alarm for a selected number of minutes. This silence time defaults to a 5 minute delay.

Time delay adjustable in the User Preference Menu.

If the Room Pressure Sensor (RPS) is unplugged from the PMT while in occupied mode, the LED bars will turn red and the local alarm will turn on.

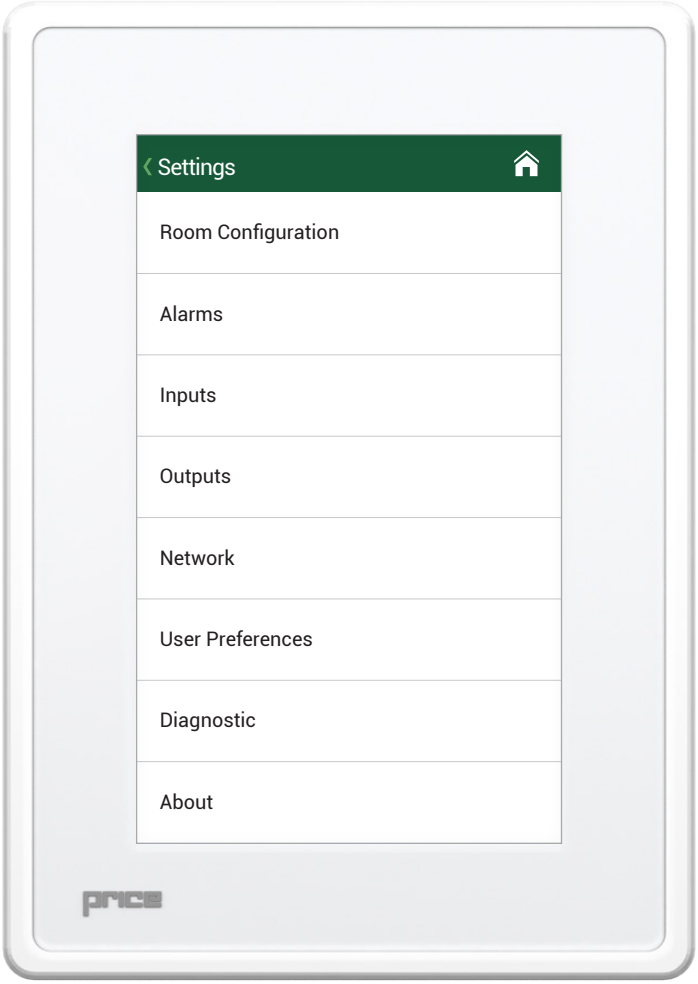
SILENCE SCREEN ▼



DISPLAY NAVIGATION

Settings

The Settings are accessible through the Home Screen and are password protected (see previous section). These menus allow the user to change any of the configurable options on the PMT.



Room Configuration – Used to adjust room mode as well as isolation mode.

Alarms – Used to configure all alarms for the PMT, as well as adjust mute times.

Inputs – Used to configure the pressure sensor, binary input, and configurable input.

Outputs – Used to configure the binary output and the analog outputs.

Network – Used to set the address and instance of the PMT for BACnet communication.

User Preferences – Allows the user to change the room mode password, as well as adjust display settings.

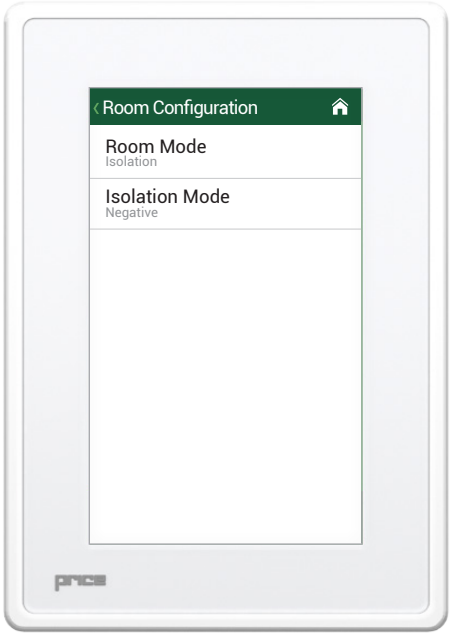
Diagnostic – Diagnostic information is available under this menu. The user is able to power cycle the PMT or restore factory defaults.

About – Displays current details about the PMT including firmware version and application version.

DISPLAY NAVIGATION

Room Configuration

The Room Configuration menu can be used to adjust the room mode and the isolation mode.

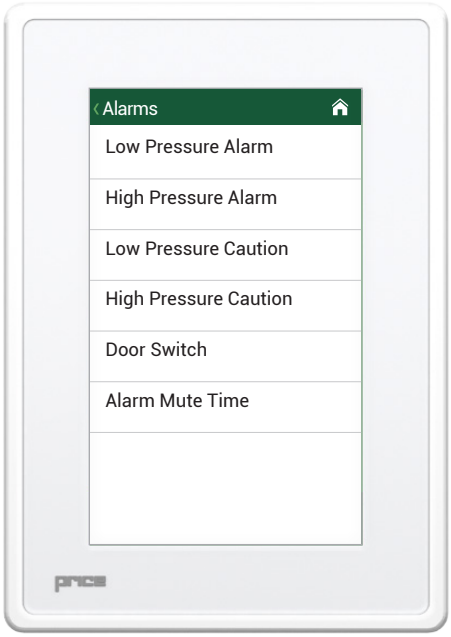


Room Mode – Used to switch between Isolation and Setback.

Isolation Mode – Used to set the monitor to Negative Isolation or Positive Isolation relative to the adjacent space.

Alarms

The Alarms menu is used to configure the high and low pressure alarms, as well as the caution alarms.



Low Pressure Alarm – Set the activation point for the Low Pressure Alarm, as well as the time delay of this alarm.

High Pressure Alarm – Set the activation point for the High Pressure Alarm, as well as the time delay of this alarm.

Low Pressure Caution – Set the activation point for the Low Pressure Caution alarm, as well as the time delay of this caution alarm.

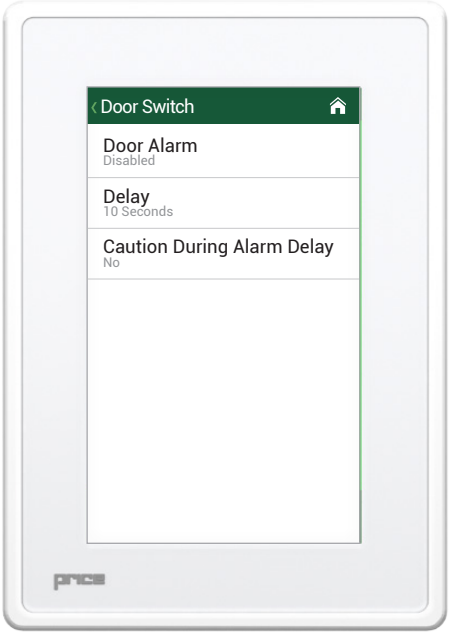
High Pressure Caution – Set the activation point for the High Pressure Caution alarm, as well as the time delay of this caution alarm.

Door Switch – This option will be available when a door switch has been configured for use with the PMT. Once available it allows the user to configure an alarm to operate based on the usage of the door switch. See Input section of this manual for instructions on configuring the door switch.

Alarm Mute Time – Sets the length of time for which all alarms will be muted.

DISPLAY NAVIGATION

Alarms - *Door Switch*



Door Alarm – Allows the user to configure the binary input.

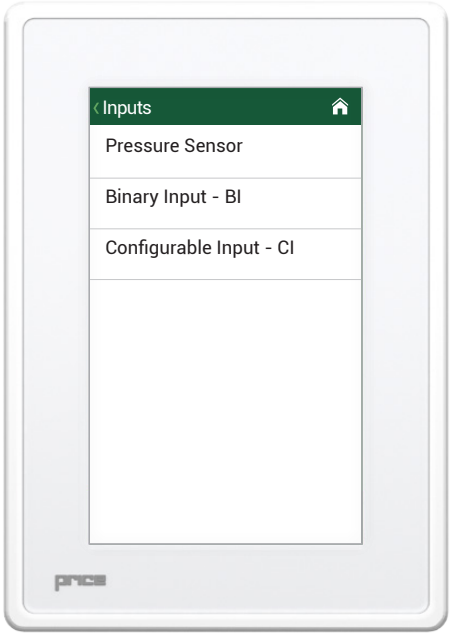
Delay – Enables and sets the door alarm delay

Caution During Alarm Delay – Enables caution mode when during the user set delay period.

DISPLAY NAVIGATION

Inputs

The Input menus allow the user to configure all of the binary and analog inputs for a variety of different applications.



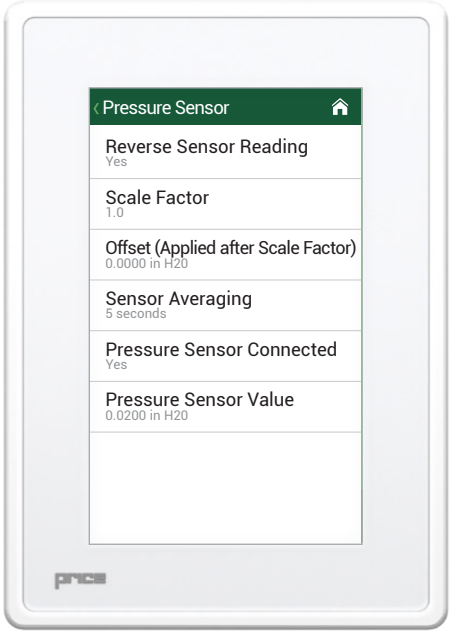
Pressure Sensor – Used to configure the pressure sensor. This includes adjusting scale and offset factors as well as the option to reverse the sensor state.

Binary Input - BI – Configure the binary input. The user is able to assign the usage of this input (door, setback, alarm, caution) as well as view its current state.

Configurable Input - CI – This input is typically used with a Room Mode Key Switch. It can also be used as a second binary input (door, setback, alarm, caution).

NOTE: The PMT will prioritize inputs in the following order:
1. Room Mode Key Switch
2. BACnet
3. Binary input
4. Configurable input

Inputs - *Pressure Sensor*



Reverse Sensor Reading – Gives the user the option to reverse the direction of the pressure reading if the pressure sensor was installed backwards. Available selections: Yes, No.

Scale Factor – Use this setting to adjust the room pressure reading to match a balancer's reading taken by a manometer.
For example, if a balancer's reading is 10% higher than the PMTs reading, set the scale factor to 1.100.
Default value : 1.000 (No adjustment).

Offset (Applied after Scale Factor) – This setting applies a fixed offset to the room pressure reading. DO NOT use this value as the primary adjustment method to the room pressure reading. Use only if required when performing a calibration at two or more pressure readings.
Default: 0.0000 in.w.c.

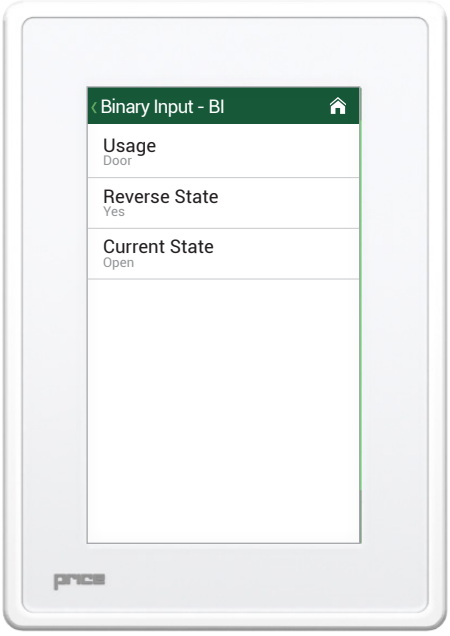
Sensor Averaging – Allows the user to set the sensor averaging time. Available selections: 5 Seconds, 10 Seconds, 15 Seconds, 20 Seconds, 30 Seconds, 40 Seconds, 1 Minute.
Default: 10 seconds.

Pressure Sensor Connected – Displays the state of the pressure sensor connection.

Pressure Sensor Value – Displays the current pressure sensor value. This is the same reading as displayed on the main screen. Scale factors and offset are applied.

DISPLAY NAVIGATION

Inputs - *Binary Input - BI*



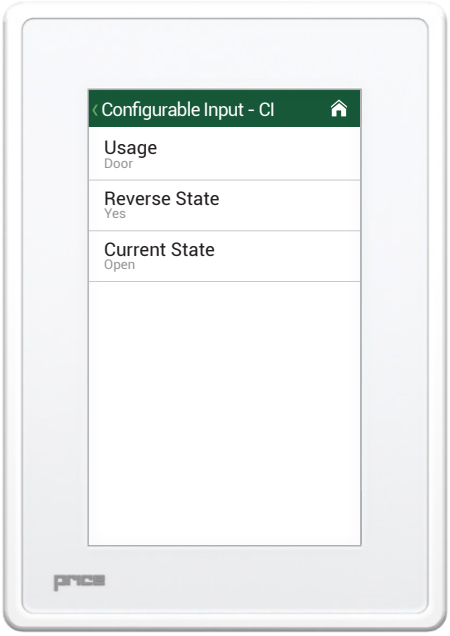
Usage – Allows the user to configure the binary input.
Available selections:

- None: The binary input is not tied to any functionality within the PMT. Its current state is visible to the BACnet front end.
- Door: This allows the user to configure a door switch. Once selected for the Binary Input, the user must configure the "Door Switch" setting under the Alarms menu (See page 12).
- Setback: When the binary input is open/closed the monitor will change to Setback mode.
- Alarm: When the binary input is open/closed the monitor will go into Alarm mode.
- Caution: When the binary input in open/closed the monitor will go into Caution mode.

Reverse State – Allows the user to reverse the action of the Binary Input.

Current State – Displays the current state of the Binary Input.

Inputs - *Configurable Input - CI*



Usage – Allows the user to configure the binary input.
Available selections:

- None: The configurable input is not tied to any functionality within the PMT. Its current state is visible to the BACnet front end.
- Door: This allows the user to configure a door switch. Once selected for the configurable input, the user must configure the "Door Switch" setting under the Alarms menu (See page 12).
- Setback: When the configurable input is open/closed the monitor will change to Setback mode.
- Alarm: When the configurable input is open/closed the monitor will go into Alarm mode.
- Caution: When the configurable input in open/closed the monitor will go into Caution mode.
- Key Switch – Room Mode: When the Room Mode key switch is enabled the Configurable Input will have full control of the room mode. It allows the user to change between Setback and Isolation mode.

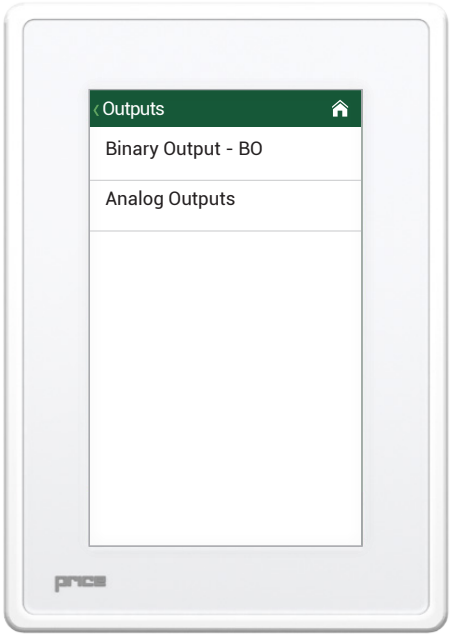
Reverse State – Allows the user to reverse the action of the Configurable Input.

Current State – Displays the current state of the Configurable Input.

DISPLAY NAVIGATION

Outputs

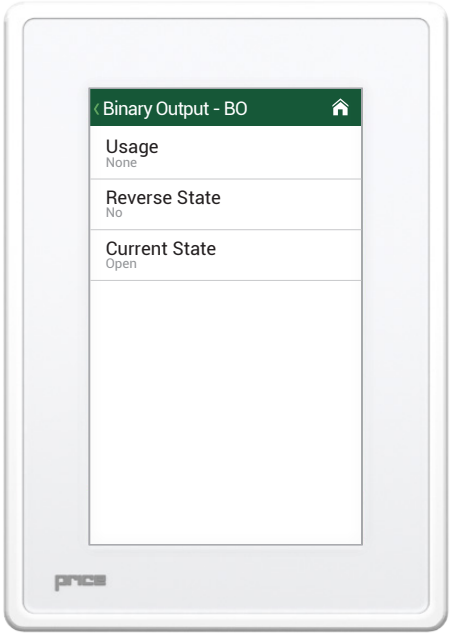
The Output menus allow the user to configure all of the binary and analog outputs for a variety of different applications.



Binary Output - BO – Used to set the usage of the binary output. This includes triggering on different isolation modes, setback, door status, binary input, configurable input, low or high pressure.

Analog Outputs – Analog outputs are split into three categories, the voltage output for each is described below.

Outputs - *Binary Output - BO*



Usage – Allows the user to configure what action will trigger the binary output.
Available selections:

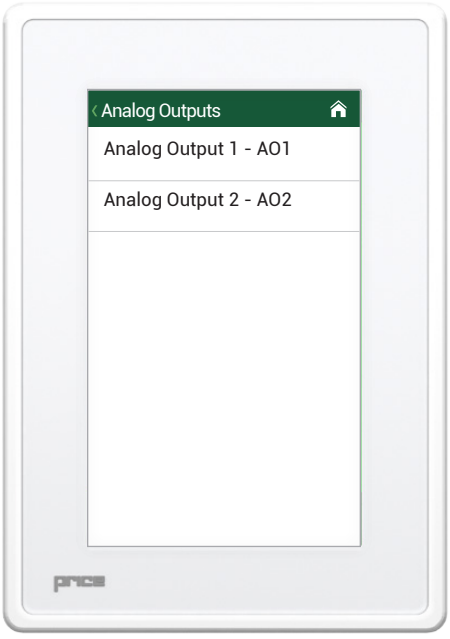
- None: The Binary Output is unused.
- Isolation – Alarm: The BO will be active when the monitor goes into Alarm while in Isolation Mode.
- Isolation – Caution: The BO will be active when the monitor goes into Caution while in Isolation Mode.
- Isolation – Normal: The BO will be active when the monitor is in normal operation while in Isolation Mode.
- Setback: The BO will be active when the monitor is in Setback mode.
- Door Status: The BO will be active when the door is open/closed (depending on the door switch state).
- Binary Input – BI: The BO will follow the status of the Binary Input.
- Configurable Input – CI: The BO will follow the status of the Configurable Input.
- Low Pressure: The BO will be active when the room pressure is below the set Low Pressure Limit.
- High Pressure: The BO will be active when the room pressure is above the set High Pressure Limit.

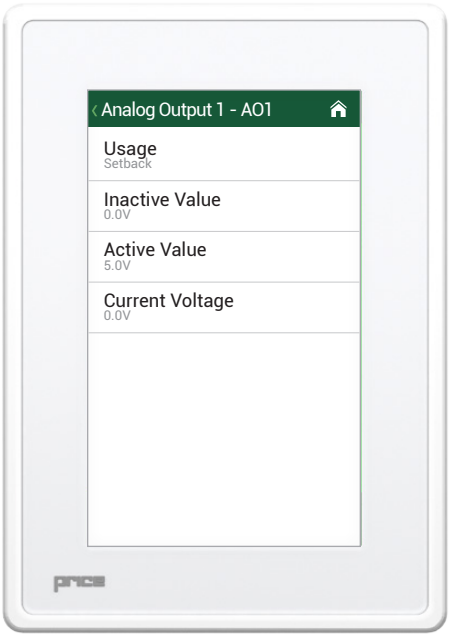
Reverse State – Allows the user to reverse the action of the Binary Output.

Current State – Displays the current state of the Binary Output.

DISPLAY NAVIGATION

Outputs - *Analog Outputs*





The PMT has two available analog outputs. A01 and A02 have the following options.

Usage – Allows the user to configure what action will trigger the Analog output.
Available selections:

1. None: The Analog Output is unused.
2. Pressure -0.1 to 0.1 in.w.c.: The analog output will follow the pressure signal from -0.1 to 0.1 in.w.c. 0 VDC will correspond to -0.1 in.w.c and 10 VDC will correspond to 0.1 in.w.c.
3. Pressure 0 to -0.1 in.w.c.: The analog output to follow the pressure signal in the range of (0.0 to 0.1 in.w.c.) or (0.0 to -0.1 in.w.c.) depending on the isolation mode that has been selected (negative or positive isolation Isolation). 0 VDC will correspond to 0.0 in.w.c., and 10 VDC will correspond to either maximum (negative or positive).
4. Isolation – Alarm: The Analog Output will output the active value (voltage) when the room is in Isolation – Alarm mode. The user can set the value of the output anywhere between 0 to 10 VDC.
5. Isolation – Caution: The Analog Output will output the active value (voltage) when the room is in Isolation – Caution mode. The user can set the value of the output anywhere between 0 to 10 VDC.
6. Isolation – Normal: The Analog Output will output the active value (voltage) when the room is in Isolation – Normal mode. The user can set the value of the output anywhere between 0 to 10 VDC.
7. Setback: The Analog Output will output the active value (voltage) when the room is in setback mode. The user can set the value of the output anywhere between 0 to 10 VDC.
8. Door Status: The Analog Output will output the active value (voltage) based on the door switch status. The user can set the value of the output anywhere between 0 to 10 VDC.
9. Binary Input – BI: The Analog Output will output the active value (voltage) based on the current status of the Binary Input. The user can set the value of the output anywhere between 0 to 10 VDC.
10. Configurable Input – CI: The Analog Output will activate based on the Configurable Input status. The user can set the value of the output anywhere between 0 to 10 VDC.
11. Low Pressure: The Analog Output will output the active value (voltage) when room pressure is measured below the set Low Pressure alarm threshold when the room is in the Isolation mode. The user can set the value of the output anywhere between 0 to 10 VDC.
12. High Pressure: The Analog Output will output the active value (voltage) when room pressure is measured above the set High Pressure alarm threshold when the room is in the Isolation mode. The user can set the value of the output anywhere between 0 to 10 VDC.

Inactive Value – Sets the output voltage when the Analog Output is inactive. When options 2 or 3 above are selected, this value is not configurable.

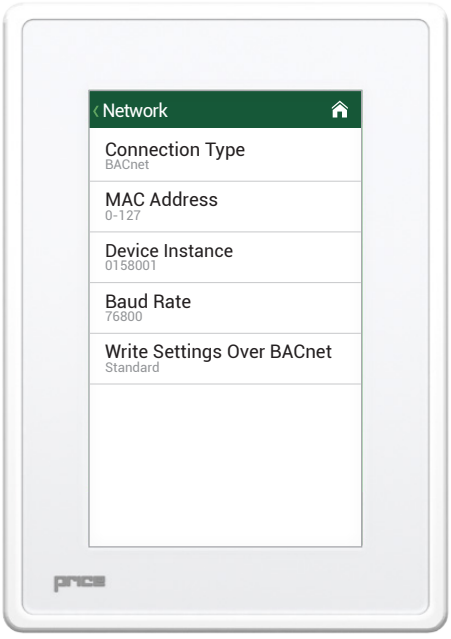
Active Value – Sets the output voltage when the Analog Output is active. When options 2 or 3 above are selected, the value is not configurable.

Current Voltage – Displays the current output voltage of the analog output.

DISPLAY NAVIGATION

Network

The Network menu is used to access all options for the BACnet communication. The PMT has native BACnet available as standard.



Connection Type – Allows the user to enable/disable BACnet communication. If BACnet is not configured in the Startup Wizard, this will default to disabled.

MAC Address – Allows the user to set the BACnet MS/TP MAC address in the range of 1 - 127. Note: Ensure that no duplicate MAC addresses exist on any network segment.

Device Instance – This is the BACnet address and must be unique on your building site.
Range: 1 - 4,194,303.

Baud Rate – This sets the BACnet MS/TP baud rate. All Devices on a BACnet segment must run at the same baud rate.
Available selections:

- 9,600 baud
- 19,200 baud
- 38,400 baud
- 76,800 baud

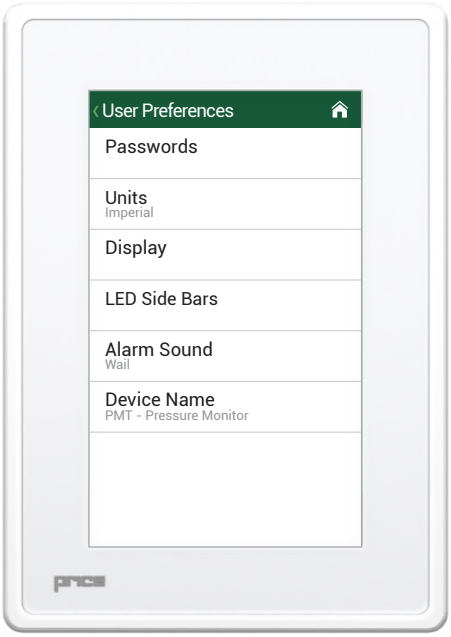
Write Settings over BACnet – This sets the write privilege of the device. Available selections: Disabled, Standard, Open.

TOUCHSCREEN ROOM PRESSURE MONITOR

DISPLAY NAVIGATION

User Preferences

User Preferences can be used to change display settings, alter passwords, adjust the color scheme and rename the device.



Passwords – Enable or disable the room mode password. Allows the user to set the room mode password in the range of 0-0-0-1 to 9-9-9-9. Setting the password to 0-0-0-0 will disable the password. Default: 1-2-3-4

Units – Enables how units appear on the device and BACnet. Options include Metric or Imperial.

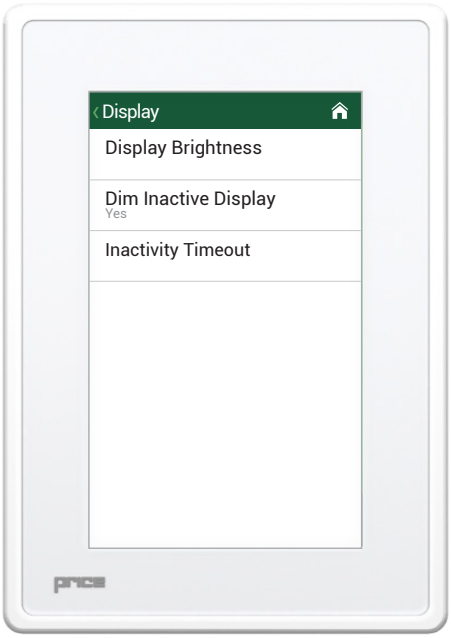
Display – Adjust the display settings, including brightness, inactivity dim and inactivity timeout.

LED Side Bars – This menu allows the user to set the action of the LED Side Bars during each different mode. The sidebar brightness can also be adjusted in this menu.

Alarm Sound – This sets the type of alarm the PMT will emit.
Available selections: No Tone, Steady 2KHz, Wail, Red Alert

Device Name – Allows the user to set the name of the PMT that appears on the Home Screen, as well as the BACnet device name.

User Preferences - *Display*



Display Brightness – Set the active display brightness.

Dim Inactive Display – Allows the user to dim the display when inactive

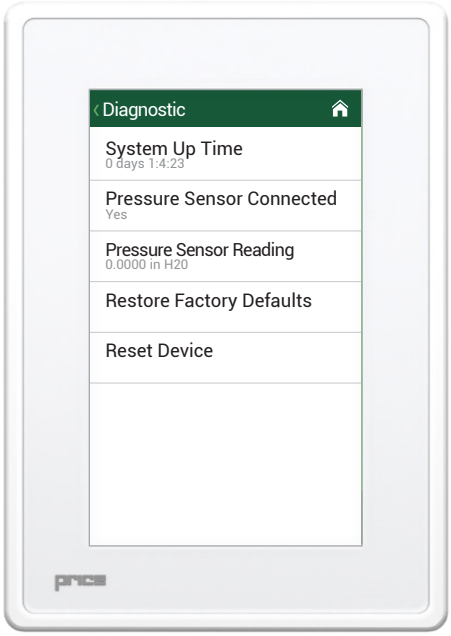
Inactivity Timeout – Set the length of time before the display will dim. Available selections: 15 Seconds, 30 Seconds, 1 Minute, 2 Minutes, 10 Minutes, 30 Minutes. Default: 15 seconds

TOUCHSCREEN ROOM PRESSURE MONITOR

DISPLAY NAVIGATION

Diagnostics

The Diagnostics menu is used to display critical information for the PMT including device up time, the connection state of the pressure sensor as well as the current pressure reading. This menu can also be used to power cycle the PMT and restore factory defaults.



System Up Time – Displays the elapsed time since last power cycle of the PMT.

Pressure Sensor Connected – Displays the connection state of the pressure sensor.

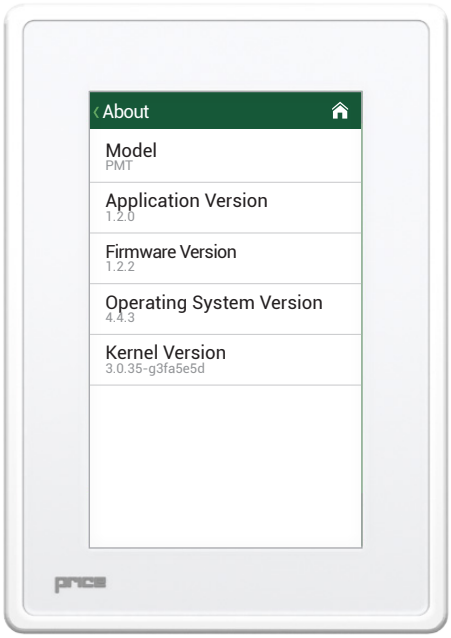
Pressure Sensor Reading – Displays the current sensor reading.

Restore Factory Defaults – This resets the PMT to factory defaults, restarts the device and then prompts the user to navigate the Startup Wizard.

Reset Device – This option will power cycle the PMT.

About

The About menu displays current information pertaining to the device operating system and version numbers.



Model – Displays the model, PMT.

Application Version – Displays the current operating system application version.

Firmware Version – Displays the current firmware version.

Operating System Version – Displays the current operating system version.

Kernel Version – Displays the current kernel version.

NETWORKING AND SETUP

BACnet Integration

The PMT is BTL listed Native BACnet MS/TP device.

Physical connection

The BACnet MS/TP network segment must be run in a daisy-chain configuration.
Recommended MS/TP cable:

- Twisted pair
- Shielded (either foil or braided shields)
- Characteristic impedance: 100-130 ohms
- Capacitance between conductors: less than 30pF per foot (100pF per meter)
- Optional 3rd conductor for reference connection.

Depending on the existing architecture, the MS/TP segment can be run as a 2-wire network or a 3-wire network.
Using a 2-wire network architecture, daisy-chain both the "+" and "-" connections of all devices on the network segment using the twisted-pair data cables. Polarity must be maintained across all devices as shown in **Figure 1**.
Using a 3-wire network architecture, daisy-chain the "+" and "-" connections of all devices using the twisted-pair data cables, and daisy-chain the network common reference signal using the 3rd conductor (if present in cable) as shown in **Figure 2**.
Do not use the wire shield as the network common reference conductor. Polarity must be maintained across all devices.
NOTE: When using non-isolated power supplies (ie. Transformer secondary common connected to ground), 24 VAC polarity is critical to network communication and must not be reversed on any device.

Network cable shielding

When using shielded cable, the braid/foil shield must be grounded at one end of the network segment only. Connect the shield of the cable entering a device to that of the cable exiting the device. Do not connect the shield to any terminals labeled "ground"/"GND" or "common"/"COM" except when grounding the shield at one end only.

Network termination

The MS/TP network must be terminated at each end of the network segment. Termination involves connecting a 100-130 ohm resistor between the "+" and "-" network terminals. Some devices are terminated by default (eg. Routers) and some have optional hardware or software termination settings.
When adding a PMT to the end of an existing BACnet network, ensure the termination is removed or disabled from the previous BACnet device, and the network is properly terminated after the PMT.

PMT configuration settings:

When connecting the PMT into an exisiting BACnet network, the network settings must be assigned by or obtained from the building automation system contractor. The following information is required:

1. MAC Address
   a. Range: 0-127
   b. This address must be unique to each PMT or device within the physical network segment to which it is connected.
2. Device Instance
   a. Range: 0-4,194,303
   b. This address must be unique to each BACnet enabled device within the entire BACnet network.
3. BAUD rate
   a. Options: 9,600, 19,200, 38,400, 76,800
   b. All devices on the same physical network segment must use the same BAUD rate.

FIGURE 1: 2-WIRE NETWORK CONNECTIONS: ▼

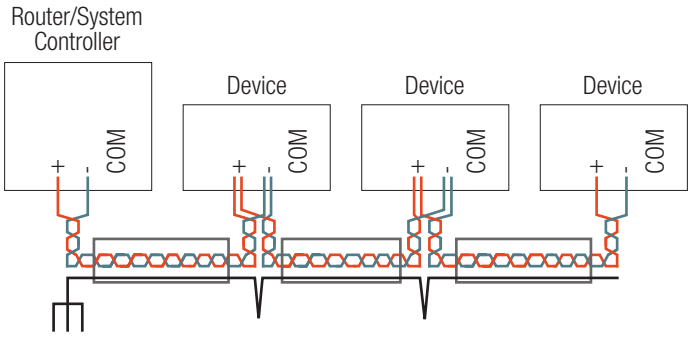
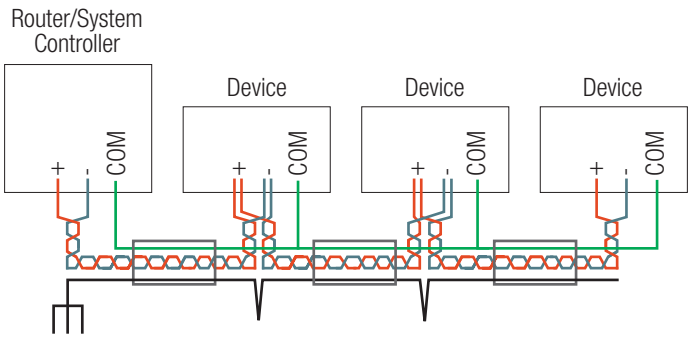


FIGURE 2: 3-WIRE NETWORK CONNECTIONS ▼



BACnet points

NOTE: Units in table are shown in imperial. The units will convert to metric with corresponding ranges if metric units are selected in the User Preference menu.

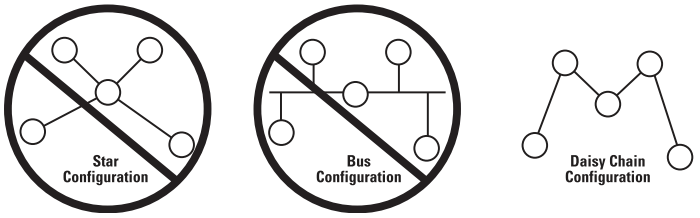
Object	Name	Units	Range	Description/Notes	Write Setting		
ANALOG INPUTS					**Disabled**	**Standard**	**Open**
AI1	Room Pressure	in.w.c.	-0.100 to 0.100	Differential pressure between the monitored room and the reference space. Measured by the RPS sensor.	R	R	R
BINARY INPUTS							
BI1	Binary Input 1 – [Usage]	On/Off	On/Off	Binary Input with multiple usages. See Input and Output section of PMT manual for options.	R	R	R
MULTISTATE INPUTS							
MI1	Configurable Input 1 – [Usage]	Dynamic	Dynamic	Multistate Input with multiple usages. See Input and Output section of PMT manual for options.	R	R	R
ANALOG OUTPUTS							
AO1	Analog Output 1	VDC	0 to 10	Analog output with multiple usages. See Input and Output section of PMT manual for options.	R	R/W	R/W
AO2	Analog Output 2	VDC	0 to 10	Analog output with multiple usages. See Input and Output section of PMT manual for options.	R	R/W	R/W
BINARY OUTPUTS							
BO1	Binary Output 1	On/Off	On/Off	Binary output with multiple usages. See Input and Output section of PMT manual for options.	R	R/W	R/W
ANALOG VALUES							
AV1	Room Low Pressure Alarm	in.w.c.	-0.100 to 0.100	Trip point for low pressure alarm. Value will be between 0 to 0.1 for Positive room mode and 0 to -0.1 for Negative room mode.	R	R	R/W
AV2	Room Low Pressure Alarm	in.w.c.	-0.100 to 0.100	Trip point for low pressure alarm. Value will be between 0 to 0.1 for Positive room mode and 0 to -0.1 for Negative room mode.	R	R	R/W
MULTISTATE VALUES							
MV1	Status	Text	1 to 4	Displays the current state of the room being monitored. 1 - Normal 2 - Caution 3 - Alarm 4 - Setback	R	R	R
MV2	Status Override	Text	1 to 5	Allows BACnet to override the state of the room. 1 – No Override 2 – Force Isolation 3 – Force Caution 4 – Force Alarm 5 – Force Setback	R	R	R/W
MV3	Room Isolation Mode	Text	1 to 2	Displays whether room is in positive or negative isolation mode. 1 - Positive 2 - Negative	R	R	R/W

BACnet points

Object	Name	Units	Range	Description/Notes	Write Setting		
					Disabled	Standard	Open
MV4	Alarm Status	Text	1 to 8	Displays the cause of any alarms that may be present. 1 - No Alarm 2 - Network Override 3 - Configurable Input 4 - Binary Input 5 - Missing Pressure Sensor 6 - Low Room Pressure 7 - High Room Pressure 8 - Door Open	R	R	R
MV5	Caution Status	Text	1 to 8	When the PMT is in caution mode, this variable indicates the cause of the caution state. 1 - No Alarm 2 - Network Override 3 - Configurable Input 4 - Binary Input 5 - Door Open 6 - Low Room Pressure 7 - High Room Pressure 8 - Missing Pressure Sensor	R	R	R

Troubleshooting

The following information is provided in the event the PMT does not appear to be functioning normally after installation.

Problem	Solution
BACnet Communication Errors	1. BACnet MS/TP is based on a RS-485 network. It must be wired in a daisy chain configuration. A daisy chain means that there is only one main cable, and every network device is connected directly along its path.  **Do not use Star, Bus, "T" or any other type of network configuration.** Any of these other network configurations will result in an unreliable network and will make troubleshooting difficult. Correct polarity is imperative on MS/TP wiring. Always ensure that the positive terminal on a device has the same color wire connected to it throughout the network, same for the negative terminal. Eg. Two wire conductor with black and white wire - black to the positive terminal, and white to the negative terminal. Keep this consistent throughout the network. 2. The network should be terminated twice, once at the beginning, and again at the end of each run. This is strongly recommended. The network speed or baud rate must be the same throughout the network. **NOTE:** The default speed for Price BACnet MS/TP controls is 76,800. BACnet MS/TP currently supports 4 standard speeds which are: 9,600, 19,200, 38,400, 76,800. 3. Binary address must be unique for each device on the network. No two devices can have the same address. This includes if you are incorporating a Price product into an existing network. Determine the existing addressing scheme for the existing network. The address is set using the Network service menu. 4. Grounding and 24 VAC polarity: proper grounding is absolutely essential when wiring the MS/TP BACnet network. Proper grounding will prevent many potential problems that can occur in a network of devices. Common symptoms of a poorly grounded network can include inconsistent BACnet MS/TP communications and damage from voltage spikes. The most practical method of grounding is to ground every 24 VAC transformer common/neutral used to power the controls. Connect the "common/neutral" wire of the **secondary** side of the transformer to earth ground - such as the ground screw in the electrical box. **NOTE:** Reversing 24 VAC **hot** and **common** will cause the BACnet MS/TP network to stop communicating. Ensure **hot** and **common** are not reversed on any controllers. (**WARNING:** Controllers will still power up and run even if **hot** and **common** are reversed. However output signals to other devices such as heaters, relays, etc. will not work as intended)

MAINTENANCE

Troubleshooting

Problem	Solution
PMT is non-responsive	Check the power connection to the PMT. Ensure the monitor has 24 VAC power with a voltmeter. Cycle power to the monitor.
Binary Output not functioning	Ensure that the PMT has 24 VAC power. Ensure the binary output has been configured to the appropriate usage.
Analog Outputs not functioning	Ensure the PMT has 24 VAC power. Ensure the analog output has been configured to the appropriate usage. Using a voltmeter, confirm that there is a voltage output between 0 -10 VDC. Ensure the output terminal or wire is not shorted to ground or power connection.
PMT Alarms – Missing Pressure Sensor	Ensure Pressure Sensor is connected. Check the pressure sensor cable for damage. Ensure the pressure sensor is powered. This is indicated by a small green light that is visible through the louvers on the room side of the Room Pressure Sensor.
Unable to maintain room pressure	Ensure low and high pressure alarms and cautions are set to the scheduled values. Ensure room is tightly sealed. This includes checking door jams and the gap underneath the door.
PMT screen not clearly visible (Dim)	Adjust the brightness settings under User Preferences.
PMT will not allow Room Mode to be changed	Check the state of the configurable input and the binary input. If one of these inputs is set to control the setback mode the PMT will not allow a user to switch room mode with this input.
Pressure Reading Frozen or Less Responsive	Check pressure line to sensor and ensure it is not kinked, and is properly seated on nipple. Verify averaging time set in input menu.
Pressure Reading inaccurate or unstable	Check draft from nearby diffusers. Ensure there is no air stream in front of sensor. Ensure airflow is not blowing directly over sensor.
PMT screen does not power up	Re-seat SD card on the back of the PMT.

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