MANUAL – INSTALLATION + SERVICE

Power and Control Module

Plenum Pressurization - PP1

v000 – Issue Date: 01/30/19

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PCM - PLENUM PRESSURIZATION

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PCM - PLENUM PRESSURIZATION

PRODUCT OVERVIEW

Plenum Pressure Control

Office spaces are one of the more diversely loaded spaces which, in underfloor applications, can share a common pressurized plenum. Diffusers and grilles for underfloor air distribution (UFAD) are selected based on a designed floor static pressure. This demands maintaining floor pressurization for proper comfort and system operation. Pressure nodes that are concealed within the floor diffusers are used to monitor the pressure differential in the plenum and space. Underfloor pressure controllers must be capable of handling very low pressure resolution, on the order of 0.001 in. w.g. or less. Typically, plenum pressure set-points range from as low as 0.05 in. w.g. to 0.08 in. w.g.

Control Methods

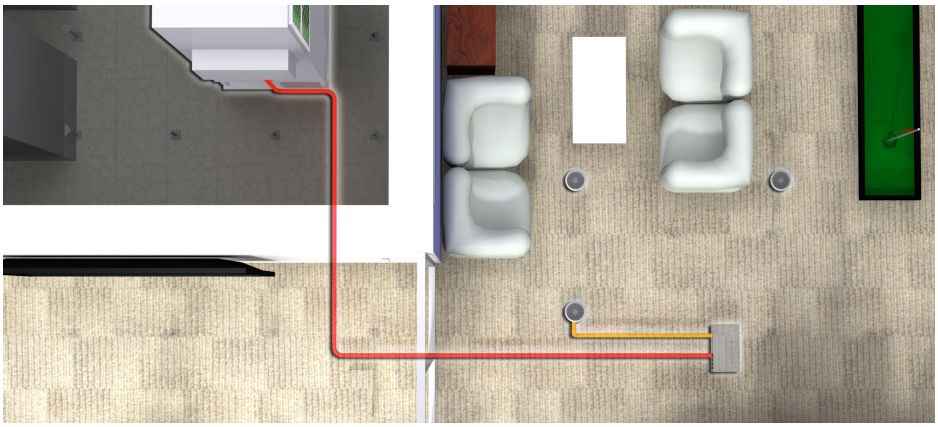
Fan Column Adjustment

Plenum pressure can be controlled by the PCM via a 0-10 VDC analog output to the Variable Frequency Drive (VFD) installed on the fan column. The fan column can be controlled to maintain a constant pressure within the plenum, adjusting to compensate for opening and closing of dampers on the installed diffusers and grilles. Alternatively, the plenum pressure setpoint can be altered based on space load to achieve the desired space setpoint.

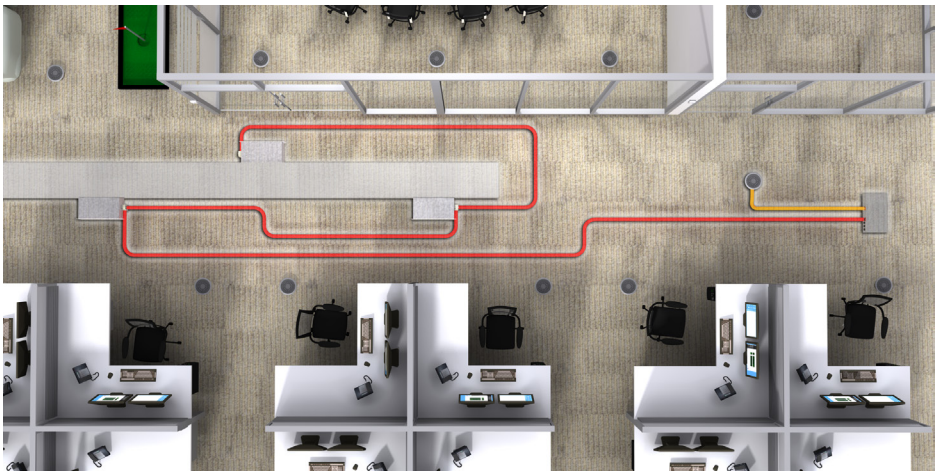
Plenum Supply Damper Adjustment

If Underfloor Deflection Grilles with Dampers (DGD) are installed, these can also be controlled by the PCM. Daisy chained together, up to twelve DGDs can be controlled via a Price plug-and-play cable to modulate the air being supplied to the underfloor plenum. Similar to modulation of the fan column, supply air can be adjusted using either a constant or variable plenum pressure control sequence.

FAN COLUMN ADJUSTMENT ▼



PLENUM SUPPLY DAMPER ADJUSTMENT ▼



PCM - PLENUM PRESSURIZATION

PRODUCT OVERVIEW

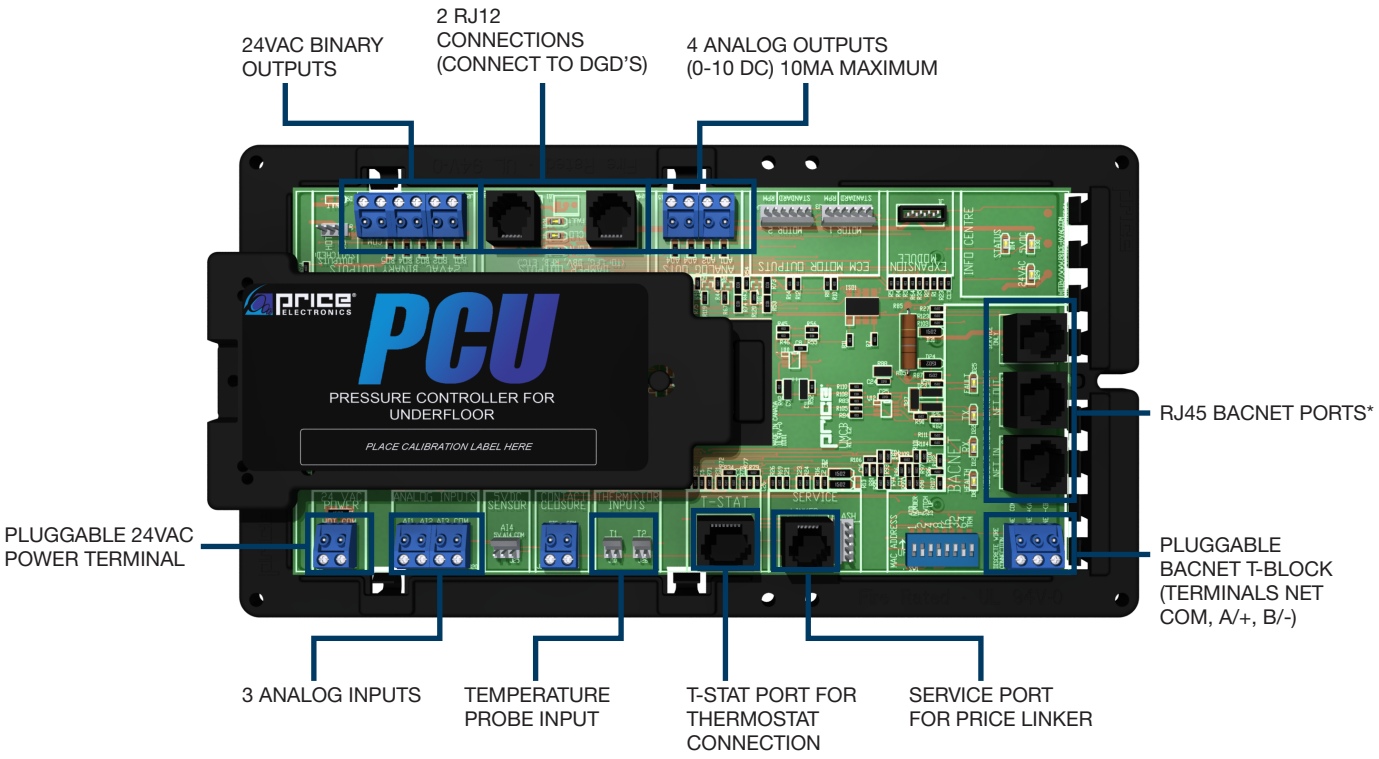
General Description

PCM - Underfloor Pressure Controller

The Price PCM with BACnet can control up to 12 plenum dampers, controlling the amount of airflow that enters the underfloor plenum. By reading static pressure sensor inputs, the PCM can monitor and regulate the very low static pressure required by typical underfloor plenums.

The PCM can be wired to multiple Price RPN (Relative Pressure Node) sensors or to third-party static pressure sensors. The outputs can operate DGD (Underfloor Deflection Grille) dampers or third-party dampers. The PCM features native BACnet connectivity and is, therefore, able to be networked to a BAS through easy plug-and-play connections.

PCM- UNDERFLOOR PRESSURE CONTROLLER ▼



** This is used for BACKET MS/TP and not an Ethernet connection*

PCM - PLENUM PRESSURIZATION

INSTALLATION & MOUNTING INSTRUCTIONS

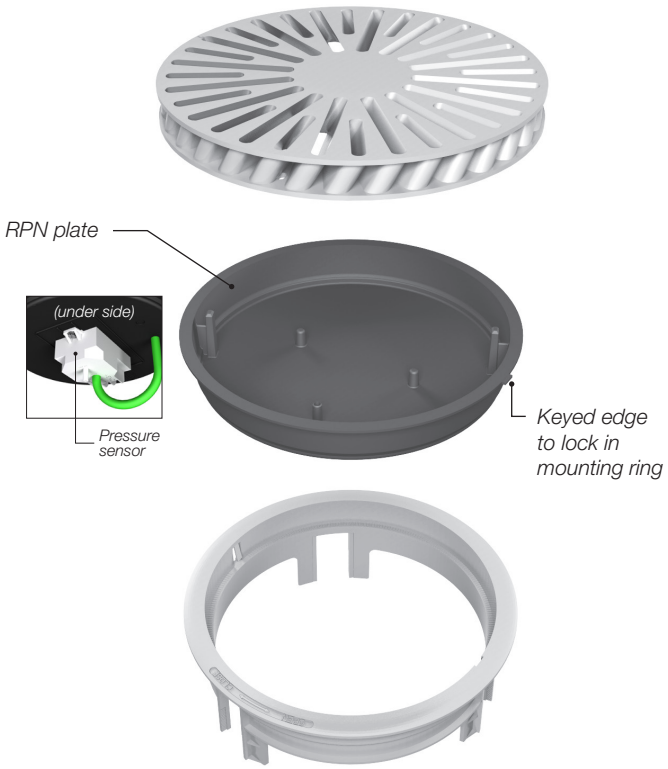
Remote Pressure Node

Plenum pressure relative to room pressure is measured using Remote Pressure Nodes (RPN). The RPN fits inside any style mounting ring and under any Price round floor diffuser. This maintains a consistent look with the installed diffusers. The RPN is equipped with an extremely sensitive pressure transducer, providing the measurement of small differential pressures with less than 1% error, which is critical to underfloor applications. This integral pressure transducer is powered via 24 VAC, and outputs a 1-10 VDC signal which is sent to the PCM to regulate plenum pressure.

Features of the PCM

- BACnet network capabilities that allow the PCM to be networked to a BAS.
- Output terminal blocks used to convey power and control signal to as many as 12 remote plenum dampers.
- Up to three input terminal blocks used to accept static pressure sensor ratings.
- ETL certified with transformer, circuit board, terminal blocks, and all necessary hardware for trouble-free installation and startup.
- 96VA Class 2 transformer.
- Available with thermostat input for temperature-dependent pressure regulation (Room Sensor, Dial, LCD, LCD with Motion Sensor, and LCD with CO2 and Humidity Monitoring).
- Constant pressure regulation or variable pressure regulation based on room temperature.
- Plenum temperature monitoring.

REMOTE PRESSURE NODE ▼



PCM - PLENUM PRESSURIZATION

INSTALLATION & MOUNTING INSTRUCTIONS

Installing the PCM

1. Place the PCM in the underfloor plenum in the center of the controlled zone using a 35 ft. cable.
2. Supply power and ground to terminal per wiring diagram. THIS TASK MUST BE COMPLETED BY A CERTIFIED AND LICENSED ELECTRICIAN.
3. Connect up to three RPN pressure transducers using field wired cable to the analog input terminals on the PCM.
4. If variable pressure sequence (9841) is used, run thermostat wire to thermostat, and plug into “T-Stat” port on the PCM. (For thermostat installation reference the Installation & Mounting Instructions Thermostat Installation section.
5. Connect BACnet network (if used). For more detailed information on networking with PCM reference the Display Navigation Address Menu section.
6. Flip the PCM’s power switch to the ON position.

PCM - PLENUM PRESSURIZATION

INSTALLATION & MOUNTING INSTRUCTIONS

Input/Output Description

24VAC Binary Outputs	Binary Output for On/Off control of fan. Multiple configurations. For example:
BO1 – Open	Aux binary output available.
BO2 – Plenum Damper	Plenum damper open. Used for floating point actuators.
BO3 – Plenum Damper	Plenum damper closed. Used for floating point actuators.
BO4 – Open	Aux binary output available.
BO5 – Open	Aux binary output available.

Analog Outputs	
AO1 – Open	Aux analog output available (0-10VDC).
AO2 – Open	Aux analog output available (0-10VDC).
AO3 – Open	Aux analog output available (0-10VDC).
AO4 – Open	Used to control variable fan or 0-10V actuators (0-10V output).
BO5 – Open	Aux binary output available.

Analog 0-10VDC Inputs	
Primary Pressure Sensor	Primary remote pressure sensor (RPN). A minimum of one sensor (primary) is required for operation.
Secondary Pressure Sensor	Additional RPN. Controller uses average of these inputs.
Tertiary Pressure Sensor	Additional RPN. Controller uses average of these inputs.

Additional Inputs	
AI1 – 5VDC Sensor	Typically used for voltage monitoring over BACnet network.
Contact Closure	Configurable Binary Input can be used for night setback, damper force open/close etc.
AI3 – T1 Thermistor	Analog Input for temperature probe hookup with 10k Type J Thermistor. Typically used for temperature monitoring over BACnet network. Can also be configured for heat/cool changeover if required.
AI8 – T2 Thermistor	Typically used for temperature monitoring over BACnet network.

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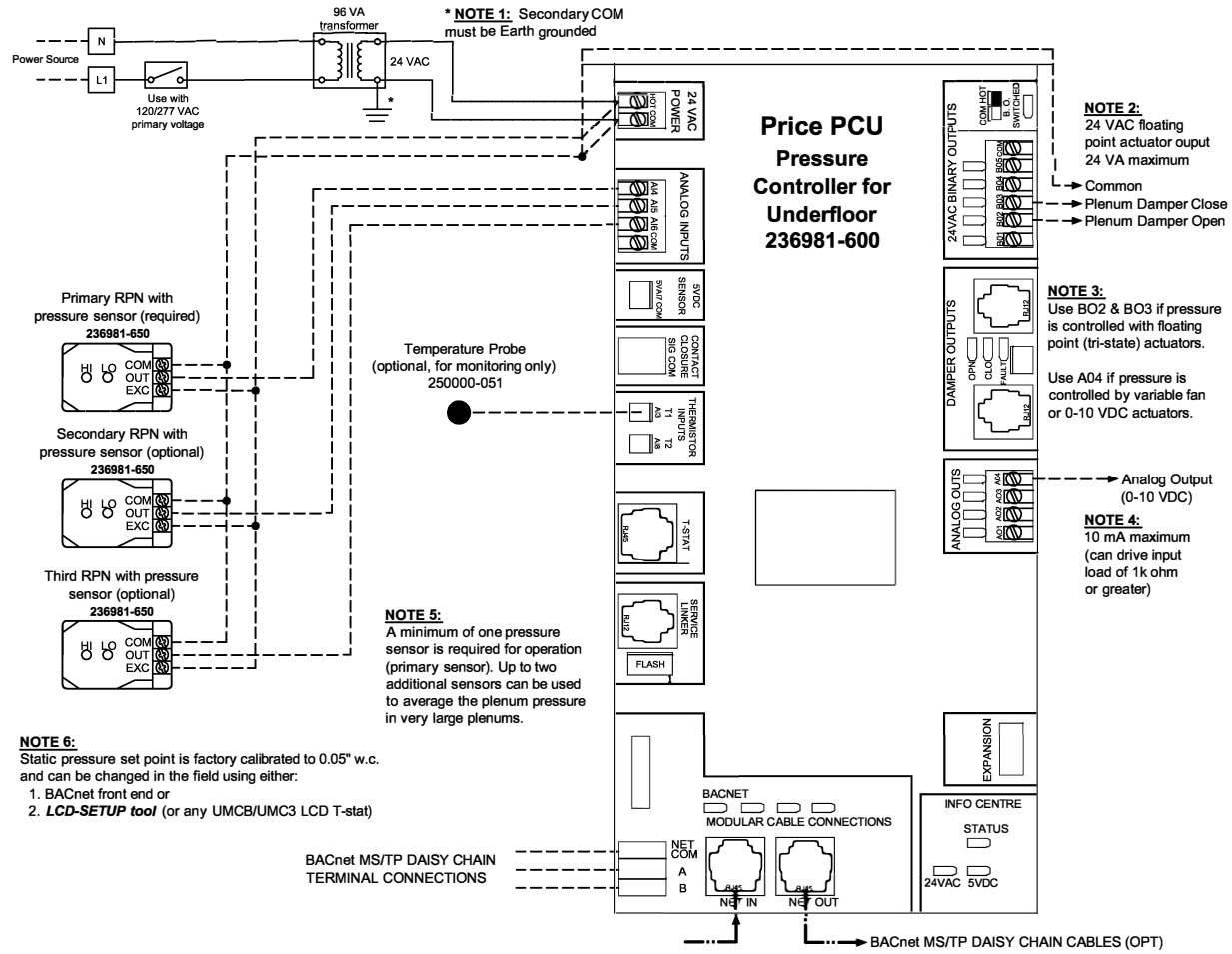
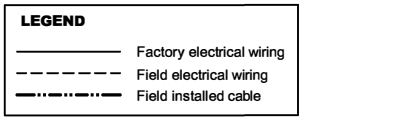
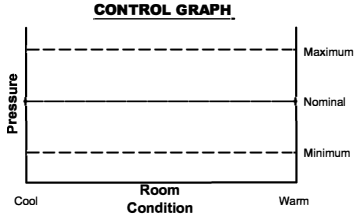
INSTALLATION & MOUNTING INSTRUCTIONS

Wiring

Below is an example of a typical PCM sequence diagram – constant pressure application. Each PCM has a sequence pre-programmed at the factory, however many adjustments can be made in the field with either an LCD thermostat or the USB LINKER service tool.







Sequence of Operation -- Constant Pressure

On startup, the controller will calibrate all dampers to the fully-closed position for 2 minutes.

Regardless of room condition, the pressure controller will maintain plenum pressure at the pre-selected pressure set point (default: 0.05 "w.c.).

On an increase in plenum static pressure the controller will command the actuators to close the supply dampers (B03), or command the fan to reduce speed (A04), in order to decrease the amount of air delivered into the underfloor plenum. On an decrease in plenum static pressure the controller will command the actuators to open the supply dampers (B02), or command the fan to increase speed (A04), in order to increase the amount of air delivered into the underfloor plenum.

Upon detection of air handler shutdown (zero plenum pressure with supply dampers fully open or fan at full speed), the controller will command the dampers and fan to the pre-selected setback target (default: 50 %).

PCM - PLENUM PRESSURIZATION

INSTALLATION & MOUNTING INSTRUCTIONS

Thermostat Installation

General Description

The PCM Thermostats are all physically the same size and mounting instructions will be typical.

Location

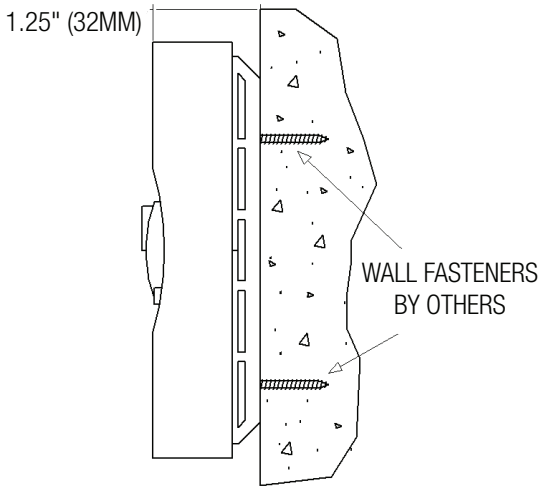
1. The PCM Thermostats must be mounted to a wall and wired to the controller via the supplied plenum rated CFLEX cable. This cable plugs into the thermostat and the PCM controller with the ease of RJ-45 connections.
   NOTE: The cable run can be extended using a Price cable coupler and an additional CFLEX cable.
2. Mount the required thermostat in a place that is convenient for the end user, but the following should be taken into consideration:
   - Do not mount a thermostat in direct sunlight i.e. across from a window where heat can alter the temperature reading.
   - Should not be installed on an outside wall.
   - Keep away from hot equipment like computers, monitors and heaters etc.
   - Ensure nothing will restrict vertical air circulation to the thermostat. (Do Not Cover)
   - Ensure wall is NOT pressurized! Hot/Cold air from a pressurized wall will blow directly onto the thermostat's temperature sensor causing inaccurate readings.

Installation

1. The back plate on each thermostat is removable and can be mounted to a standard electrical box or directly to drywall using anchors supplied by others.
2. Run the CAT-5 cable through the center hole in the plate and connect the cable to the thermostat. Then, secure the thermostat onto the wall plate by inserting the top portion of the thermostat first, then snapping the bottom half in.
3. All thermostats will come equipped with a 0.050 in. Allen Key for the set screw at the bottom.

PLENUM RATED CFLEX CABLE INCLUDED ▼

SURFACE MOUNT DETAIL ▼



TECH TIP ▼

Careful thermostat installation will reduce field issues! Do not twist or kink the blue CAT-5 thermostat cable. Damaged cables are difficult to troubleshoot!

Thermostat cable product code: PIC-CABLE

PCM - PLENUM PRESSURIZATION

INSTALLATION & MOUNTING INSTRUCTIONS

How to use Thermostats

Room Sensor Thermostat

- The Room Sensor Thermostat is powered from the controller.
- Measures room temperature.
- Setpoint can be adjusted from a hidden dial on the back of the thermostat using a small flat-head screw driver.
- Setpoint limits can be adjusted through free setup software using the Price LINKER, or through a BACnet system.
- Eliminated problem of unauthorized tampering with the thermostat.
- Occupancy button can be used to override the system during unoccupied times. Default setting is 4 hours.

Dial Thermostat

- The Dial Thermostat is powered from the controller.
- Measures room temperature and features a dial adjustment and an occupancy button.
- Temperature Setpoint limits can be adjusted through free setup software using the Price LINKER, or through a BACnet system.
- Simply use the adjustable dial for temperature adjustment.
- Occupancy button can be used to override the system during unoccupied times. Default setting is 4 hours.
- LED light indicates what mode the thermostat is in. One blink is cooling mode, two blinks is heating mode, three blinks is neutral.

LCD Thermostat

- The LCD Thermostat is powered from the controller and has a variety of features.
- Measures room temperature and features an LCD screen with push button day Setpoint adjustment.
- Temperature Setpoint limits are set through the thermostat setup menus, free setup software using the Price LINKER, or through a BACnet system.
- Balancing and additional setup functions also available through the menus.
- [Optional] Add CO2 and humidity monitoring with PIC-TS-CO2H

LCD Thermostat with Motion Sensor

- The LCD Thermostat with Motion Sensor is powered from the controller and has a variety of features as well.
- This model measures room temperature, features an LCD screen with day Setpoint adjustment, and motion sensor with lighting control.
- Temperature Setpoint limits are set through the thermostat setup menus, free setup software using the Price LINKER, or through a BACnet system.
- Balancing and additional setup functions are also available through the menus.
- This model is equipped with a motion sensor to determine occupancy of the space. This sensor can also be used to control lighting.

ROOM SENSOR THERMOSTAT ▼

DIAL THERMOSTAT ▼

LCD THERMOSTAT ▼

LCD THERMOSTAT W/ SENSOR ▼

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Initial Startup:

(LCD & Motion Thermostat only)

When the LCD thermostat is powered from the PIC, it will display the following information:

PRICE ELECTRONICS	Start-up screen.
▼	
LCD THERMOSTAT STANDARD MODEL	Standard/Motion model.
▼	
LCD THERMOSTAT VERSION X.XX	Displays firmware version of thermostat.
▼	
LOADING: INITIALIZING	Loading parameters.
▼	
PCM VERSION X.XX	Controller type and controller firmware version.
▼	
SEQUENCE XXXX	Displays sequence programmed into stat. **NOTE:** A sequence number of 0 means the stat has NOT been calibrated.
▼	
MAC ADDRESS XXX	Displays current MAC Address.
▼	
DEVICE INST. XXXXXX	Displays device instance.
▼	
CURRENT PRESS 0.050 IN H20	(For example)

Changing the Setpoint – LCD & Motion Thermostat only

Day Setpoint Adjustment. Increase and decrease push buttons for Day Setpoint adjustment

DAY SETPOINT 75.0°F

DAY SETPOINT SAVING...

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Info Menu

(LCD & Motion Thermostat only)

The info menu shows information about the controller status regarding room load, damper position and BACnet Address info. No values can be changed from this menu and it is not locked or protected in any way.

Press 'Enter Menu' button to enter the User Menu, scroll through using the **up** and **down** buttons.

OCCUPANCY ON VVT MODE	The Occupancy can be determined by the contact closure, motion or by a user pressing a button.
THERM READING	Temperature reading from T1 Sensor.
DAMPER POS.	This indicates the current position of the damper as a (%). Range is 0-100% (100% = full open or maximum air).
DAMPER TARGET	This indicates the damper position as a (%) the controller is targeting. Range is 0-100% (100% = full open or maximum air).
AI4 PRESSURE	Current pressure reading on AI4 in in. w.g.
AI5 PRESSURE	Current pressure reading on AI5 in in. w.g.
CURRENT PRESS	Current final pressure reading in in. w.g.
PRESS TARGET	Current pressure target in in. w.g.
AO4 OUTPUT	Current output on the AO4.
AIRHANDLER IS ACTIVE	Controller will sense airflow if the air handler is running. If no air is present, the display will read Not Active.
MAC ADDRESS 1	Shows the BACnet MAC address. Range 1-99. MAC Addresses can be set via dip switch or through software in the thermostat.
DEVICE INSTANCE	(Instance must be "globally" unique on your site) Displays controller's BACnet Device Instance (If BACnet is attached). Device Instance can range from 0-4, 194, 303.
PRESS MENU TO EXIT	**NOTE:** Service menu will automatically time out after 20 seconds.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Service Menu

(LCD Thermostat only)

Hold down the 'Menu' button for 5 seconds, display will show '**Passcode**:'

Use 'Up' and 'Down' keys to enter the password in this sequence: **Down – Up – Up – Down**.

PRESS SETUP	Change the application the unit is operating as.
▼	
TEMP SETPOINT	(Variable Pressure application only) – page #.
▼	
INPUT	Shows sensor readings, settings, and configuration.
▼	
OUTPUT	Allows setup of Damper, Heat, Cool, outputs. Allows setup of room light output (motion stat only).
▼	
BACNET	Allows setup of BACnet addresses. MAC address, Device Instance, Baud Rate.
▼	
STAT SETUP	Allows setup of LCD back lighting, sounds, motion sensor. Adjustment of HVAC and room lighting time-outs.
▼	
PRESS MENU TO EXIT	**NOTE:** Service menu will automatically time out after 20 seconds.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Service Menu

PRESS APP:	**CONST. PRESS**	Regardless of room condition, the pressure controller will maintain plenum pressure at the pre-selected pressure setpoint (default: 0.05 in. w.g.)
	VAR. PRESS	Controller will decrease or increase static pressure based on room temperature
	CONSTPRESSBYP	Throttles the bypass valve to maintain constant pressure setpoint
	VAR.PRESSBYP	Controller will decrease or increase static pressure based on temperature
	PRESS SP-COLD	Sets cooling pressure setpoint (Constant Pressure application only)
	PRESS SP-HOT	Sets heating pressure setpoint (Constant Pressure application only)
	NOM.PRESS.COLD	In. w.g. (Variable Pressure application only) Controller will target between this value and cooling values based on duct air when PI is less than zero.
	MINPRESS-COLD	Sets the cool min pressure. Must be lower than (or same as) cool max pressure (Variable Pressure application only).
	MAXPRESS-COLD	Sets the cool max pressure. Must be higher than (or same as) cool min pressure (Variable Pressure application only).
	NOMPRESS-HOT	In. w.g. (Variable Pressure application only) Controller will target between this value and heating values based on duct air when PI is greater than zero.
	MIN PRESS-HOT	Sets the hot min pressure. Must be lower than (or same as) heat max pressure. (Variable Pressure application only).
	MAX PRESS-HOT	Sets the hot max pressure. Must be higher than (or same as) heat min pressure (Variable Pressure application only).
	UNOCC PRESSSP	Deadband on either side of the pressure set point [default .0.03 in. w.g.]
	PRESSDEADBAND	Maximum amount that output will be charged per step. Range 1-50 [default 5%].
	MAX STEP	Maximum amount that output will be charged per step. Range 1-50 [default 5%].

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Service Menu

DIVIDER	Default 250 Used to increase and decrease damper speed (damper step)
NEARPRESS.PNT	In. w.g. Near Pressure Setpoint - Reduces damper steps as it nears this pressure setpoint.
STL TIME-NEAR	120 sec how long it slows the damper when within the pressure setpoint.
STL TIME-FAR	20 sec how long it increases the damper movements when outside the pressure setpoint.
DETECTAH.SHDN	NO Detect Air Handler Shutdown: YES – Occupied and unoccupied modes triggered by pressure. (If enabled day pressure and night pressure trip trigger occupied/unoccupied mode). NO – occupied and unoccupied modes not triggered by pressure.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Temperature Setpoint Menu

(Variable Pressure application only. Setpoint Limits and Temperature Units)

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

SET LOW LIMIT 65.0F	• This is the lowest setpoint allowed. • Range: 10.0°F – 100.0°F Default: 65.0°F
▼	
SET HIGH LIMIT 80.0F	• This is the highest setpoint allowed. • Range: 10.0°F – 100.0°F Default: 80.0°F
▼	
TEMPERATURE UNITS FAHRENHEIT	• Fahrenheit or Celsius. • Default: °F
▼	
NIGHT HEAT SET 62.0F	• PIC will maintain this heating setpoint when unoccupied. • Range: 10.0°F – 100.0°F Default: 65.0°F
▼	
NIGHT COOL SET 83.0F	• PIC will maintain this cooling setpoint when unoccupied. • Range: 10.0°F – 100.0°F Default: 83.0°F
▼	
PROPORTIONAL BAND 2.0F	• Default 2°F, 1°C • Proportional Band is the range of control or the throttling range of the device.
▼	
DAY DIFFERENTIAL 1.0F	• 1°F, 0.5°C • Day differential is the deadband on either side of the setpoint.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Service Menu – Input Menu

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

#OF SENSORS 2	Number of sensors connected to the PCM.
SENSOR MODE	• Average (Default) – Gathers all sensor readings and averages them. • High Value – Uses only high sensor values. Low Value – Uses only low sensor values.
SENSOR RANGE	Default: 0.250 in. w.g.
CURRENT PRESS	Current pressure reading in in. w.g.
SUPPLYAIRTEMP	Current Supply air temperature.
NEUTRAL MODE DYNAMIC	• When supply air temperature (SAT) is below room temperature is considered cooling. • When supply air temperature (SAT) is above temperature is considered heating. • Neutral Mode = Conventional, Force Cool, Force Heat. • Conventional uses Hot and Cold switch points. • Force cool, Force Heat always assumes cold or hot. • Not recommended.
SAT OFFSET 0.0F	Apply an offset to the SAT temperature.
CONTACTCLOCFG	Not used, Unoccupied on close, Occupied when closed, Damper full open, Damper full closed.
CO2 SENSOR DETECTED	• Indicates that the CO2 sensor is connected.
CO2 TWEAK 0%	• Percentage that the CO2 reading can be tweaked if required. • Default is 0%.
CO2 OFFSET 0PPM	Value to offset CO2 reading if required. Default 0 PPM.
HUMIDITY SENSOR DETECTED	Indicates that the humidity (RH) sensor is connected.
HUMIDITY TWEAK	• Percentage that the RH reading can be tweaked if required. • Default 0%.
HUMIDITY OFFSET	• Value of offset RH reading if required. • Default 0% RH.
PRESS MENU TO EXIT	

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Service Menu – Output Menu

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

DAMPER & AO4	**BO2&3 USED AS DAMPER**	Assign use of BO2 and BO3 to reheat or damper.
	DPR. RUNTIME 95SEC.	Change the total runtime of damper.
	DPR. DIRECTION NORMAL	Changes which direction open and close are set to.
	AO4 MIN 0.0 VDC	• Default 0.0VDC.
	AO4 MAX 10.0 VDC	• Set maximum output voltage. • Default 10.0 VDC.
BO1 & AO1	**ECM COOL MIN 1.5 VDC**	• PI cooling min (-1 to – 100%) output voltage. • Default 1.5 VDC.
	ECM COOL MAX 8.0 VDC	• PI cooling max (-100%) output voltage. • Default 8.0 VDC.
	ECM HEAT MIN 1.5 VDC	• PI heating max (+100%) output voltage. • Default 1.5 VDC.
	ECM HEAT MAX 8.0 VDC	• PI heating min (+1 to +100%) output voltage. • Default 8.0 VDC.
	ECM DEADBAND 1.5 VDC	• PI in neutral/deadband. • Default 1.5 VDC.
	ECMUNOCCUPIED 1.5 VDC	• Controller in occupied mode. • Default 1.5 VDC.
	BINARYFANTYPE	This controls the binary FAN output · No Fan: Fan output disabled · Heating: Fan on when PI heating (+1 to + 100%) (Day & night mode) · DAY & NIGHT HEAT: During the day, fan is always one. During the night, the fan is only on when PI is heating (+1 to +100%) · CONTINUOUS: Fan always one · DAY AND NIGHT HEAT/ COOL: During the day, fan is always on. During the night, the fan is only on when PI is heating or cooling (+1 to + 100%) · HEAT AND COOL: Fan is on when PI is heating or cooling (+1 to +100% or -1 to – 100%)

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Output Menu - Heat

(Setup of Heat Outputs)

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

REHEAT TYPE: BINARY	•Reheat Type: Binary, Hot water, Binary/PWM, Hot Water/PWM. •Binary uses Stage 1, 2, 3 –Default. •Binary/PWM and Hot Water/PWM – Stage 3 is PWM.
DRIVE TIME 90 SECONDS	•Hotwater runtime in seconds. •Not shown if BINARY heat is used.
HEAT STAGE 1 1%	•Heat Stage 1 Trip Point: Stage 1 engages at 1% heating. •Not shown if hot water heat is used.
HEAT STAGE 2 50%	•Heat Stage 2 Trip Point: Stage 1 engages at 50% heating. •Not shown if hot water heat is used.
HEAT STAGE 3 100%	•Heat Stage 3 Trip Point: Stage 1 engages at 100% heating. •Not shown if hot water heat is used.
REHEAT FAIL SAFE OFF	•Off- Outputs sends 24 VAC on call for heat. •On- Outputs send 24VAC when no call for heat (fail open valve in cold climates – ie: Winnipeg).
ANALOG HEAT MIN 0.0 VDC	Outputs this voltage on heat analog pin when there is a minimum call for heating.
ANALOG HEAT MAX 10.0 VDC	Outputs this voltage on heat analog pin when there is a maximum call for heating.
ANALOG HEAT IDLE 0.0 VDC	Outputs this voltage on heat analog pin when there is no call for heating.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Output Menu - Cool

(Setup of Cool Outputs)

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

BINARY COOL 1%	Binary Cool Trip Point: engages at 1% cooling load.
▼	
ANALOG COOL MIN 0.0 VDC	Outputs this voltage on cool analog pin when there is a minimum call for cooling.
▼	
ANALOG COOL MAX 10.0 VDC	Outputs this voltage on cool analog pin when there is a maximum call for heating.
▼	
ANALOG COOL IDLE 0.0 VDC	Outputs this voltage on cool analog pin when there is no call for cooling.

PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Output Menu – Room Lights

(Setup of Room Lighting Output – Motion Thermostat option only)

Scroll through menu with Up and Down keys.

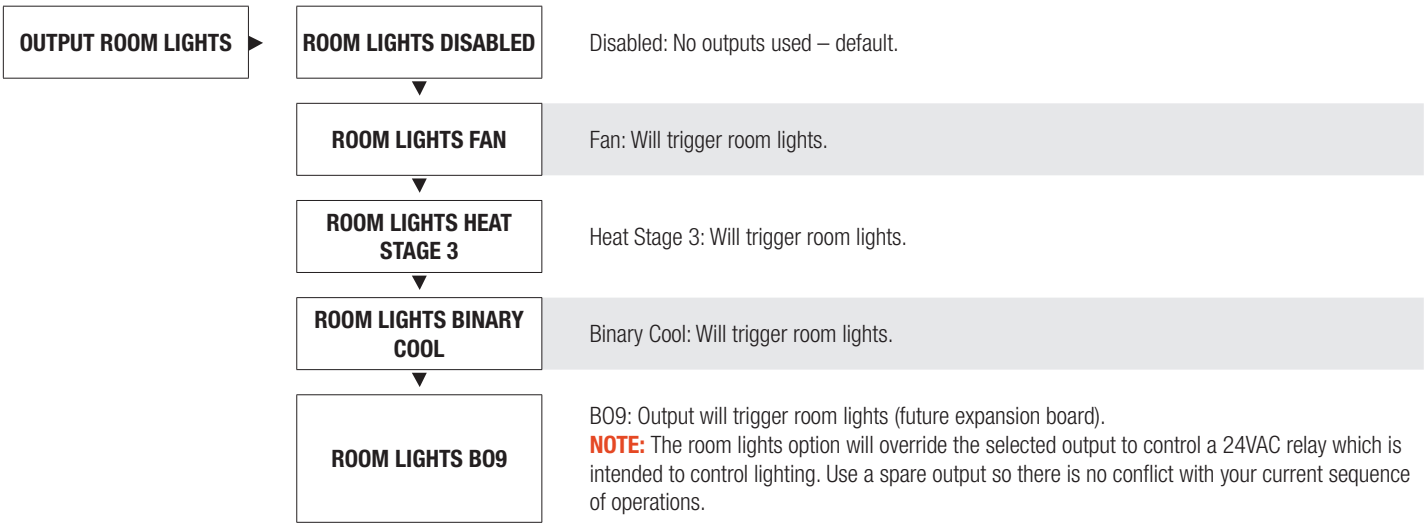
Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

Analog Outputs: Can reassign outputs as needed.

- Fan: Heat,
- Cool: Aux.

Binary Outputs: Can reassign binary outputs as needed.

- Fan: Heat 1, Heat 2, Heat 3
- Cool: Aux 1, and Aux 2



PCM - PLENUM PRESSURIZATION

DISPLAY NAVIGATION

Address Menu

(BACnet Addressing Setup)

Scroll through with the 'Up' and 'Down' buttons. Press 'Enter Menu' button to apply your changes. 'Saving...' will display as your changes are applied.

ADDRESS ▶

MAC SET IN: HARDWARE

- Hardware – uses DIP switch on BACnet module for MAC Address –Default - recommended.
- Software – uses STAT to set MAC Address – this OVERRIDES the hardware switches and could be confusing if you're not careful.

NOTE: the MAC Address (range 1-99) is added to the Device Instance
Example: MAC Address = 1, Device Instance = 100 – total Address for this PIC would be 101

▼

MAC ADDRESS HARDWARE : 1

Display current MAC Address.
NOTE: DIP switches and software MAC Address are only read on startup! See Device Instance below.

▼

MAC Address

Software: 0

When changing the MAC address in Software, MAC address will flash 0 until a new address is entered. This will override the Hardware MAC address set on the BACnet board at the dip switches.

▼

DEVICE INSTANCE

- This is the 'software' BACnet Address & MUST be unique on your building site.
- Range: 1 – 4,194,303

NOTE: After changing Device Instance the STAT will send a RESET command to the PIC to apply the ADDRESS changes. Addresses are only READ on startup, so after any changes you must reset the controller either via STAT (which is automatic) or cycle 24VAC power.
NOTE: Addresses are only read on startup to prevent a controller with faulty damaged/ improperly set DIP switches from popping up all over a network, which would be extremely difficult to troubleshoot.

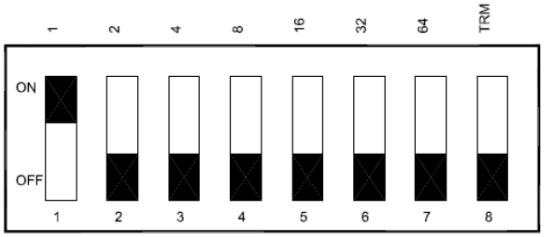
▼

BAUD RATE 76800

- This sets the BACnet MS/TP baud rate.
- 9600 baud (all BACnet devices must at least support this speed) - slowest
- 19200 baud
- 38400 baud
- 76800 baud (Default baud rate for PRICE products) - fastest

▼

PRESS MENU TO EXIT



Setting the MAC address using the Dip Switches:

The MAC address is set in binary.

Eg. to set the Address of 3, switch 1 & 2 must be in the ON postilion.

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DISPLAY NAVIGATION

Stat Setup Menu

(Stat Options)

Scroll through menu with Up and Down keys.

Press 'Enter/Menu' button to apply your changes. *---Saving---* will display as your changes are applied.

OCCUPANY ON – VVT MODE	Show current occupancy source. ON from VVT (always on), ON from Airflow, ON from Contact, ON from Motion Sensor
MOTION ENABLE OFF	(Motion Sensor STAT only) Off – motion sensor disabled – Default for regular LCD T-Stat. On – motion sensor enabled (only enabled if you have a motion stat). Only visible with motion stat.
MOTION SENSITIVITY 5	(Motion Sensor STAT only) Sets the sensitivity of the motion sensor. 1 – least sensitive 9 – most sensitive 5 – DEFAULT Only visible when motion is enabled.
MOTION TEST OFF	(Motion Sensor STAT only) Motion stat will beep each time motion is sensed. This is useful for adjusting the sensitivity value & testing.
LIGHTS TIMEOUT 60 MINUTES	(Use room light output to select lighting signal) PIC will turn off lighting output after no motion is detected and this timer expires. Default: 60 minutes
LCD BACKLIGHT ALWAYS ON	Always on (Default) Always off Button push – lights up on button press
SOUND OPTIONS USER SOUNDS	User Sounds – stat will beep when user tries to exceed a limit – Default. All off – beeper disabled. All on – stat will beep when user tries to exceed a limit or stat loses communication with the controller (for testing uses only) – not recommended.
DISPLAY OPTIONS TEMP AND SETUP	See Display Options menu.
CONTROLLER NAME	Set a custom name for the Stat.
RESETCONTROLR	Rests the controller.

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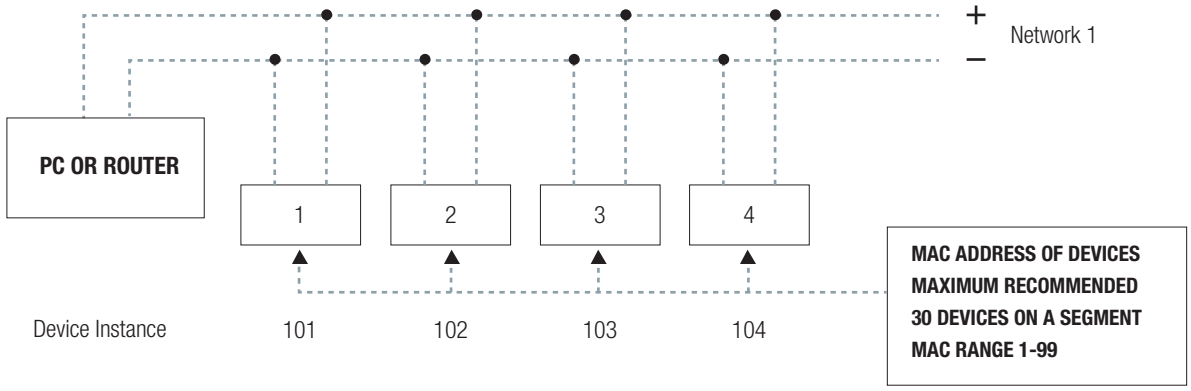
NETWORKING & SETUP

BACnet Networking and Setup

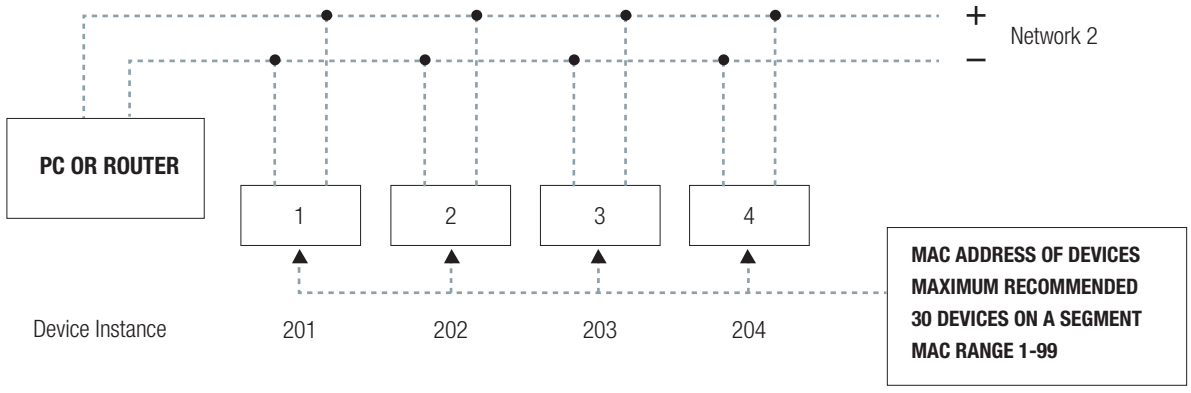
Setting the MAC Address:

MAC Address must be UNIQUE on an MS/TP network segment within building. An installer setting up an MS/TP segment with up to 30 devices must ensure each device has a UNIQUE MAC Address (Range 1-99). The MAC Address is set with DIP switches on the BACnet Module. This is the hardware setup for the MAC Address. The MAC Address can also be set in software, through the LCD Thermostat. This option of setting the address through the software is available when the controller is not accessible to the user (finished drywall ceiling for example).

NETWORK SEGMENT #1 ▼



NETWORK SEGMENT #2 ▼



TECH TIP ▼

Each device needs a unique MAC and Device Instance. All devices must be at the same baud rate. 24VAC HOT and COMMON polarities are critical and must not be reversed on ANY devices! Reverse polarity will stop communication on that MS/TP segment.

Setting the Device Instance

Device Instance:

A device instance number identifies a device within an entire building, therefore giving it a unique number or address, much like a telephone ext. number. A building can have one telephone number, but all the extensions have a unique number to identify them. A device instance number would work the same way and must be unique throughout the building. The Device Instance number is user set through the LCD Thermostat or the USB LINKER tool.

Below is a table defining how a device instance number is obtained

NOTE: Each device on a network segment must be set to run at the same speed or baud rate.

Description	Default Value (Factory)	Notes
MAC Address	Set by DIP switch	Value: limited to 1-99
Tier1 (x100)	58	Value: limited to 0-99
Tier2 (x10,000)	1	Value: limited to 0-99
Tier3 (x1,000,000)	0	Value: limited to 0-4

Example Device Instance setup with Default settings:

- MAC Address = 4 (4 x 1 = 4) – Set by DIP Switches on BACnet module, or through software.

  +

  TIER 1 = 58 (58 x 100 = 5800) – Set through software

  +

  TIER 2 = 1 (1 x 10,000 = 10,000) – Set through software

  +

  TIER 3 = 0 (0 x 1,000,000 = 1,000,000) – Set through software

  =

  Final Device instance = 0,015,804

  Final Device instance =

0	01	58	04
Tier3 Multiplier	Tier2 Multiplier	Tier1 Multiplier	MAC Address

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NETWORKING & SETUP

LINKER - USB Service Tool

The Price USB LINKER is the interface that can be used with any of the Price Thermostat for the PCM. The LINKER connects to a laptop (not supplied) via a USB A to B cable supplied by Price, and then connects to the service jack of the thermostat via an RJ-12 cable supplied by Price. Setup of the controller can then be performed using the connected laptop.

LAPTOP CONNECTION ▼

Laptop
Setup Tool

▶

USB A-B Cable
Connects into laptop & LINKER

▶

LINKER
Interface

▶

RJ-12 Cable
Plugs into LINKER & then into bottom of thermostat

▶

Dial Thermostat

An LCD Thermostat can be purchased as an upgrade and used to perform setup/balancing instead of a laptop/LINKER Tool. The LCD Thermostat provides full functionality for system setup.

LCD CONNECTION ▼

LCD Thermostat
Setup Tool

▶

RJ-12 Cable

▶

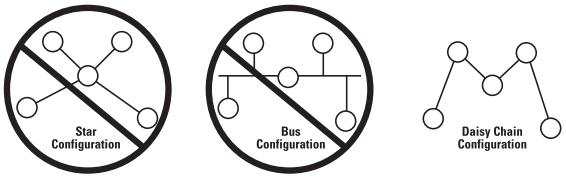
Dial Thermostat

PCM - PLENUM PRESSURIZATION

MAINTENANCE

Troubleshooting

The following information is provided in the event that the PCM does not appear to function properly after installation.

Fault	Solution
Controller appears to be not responding or have no power. Green light on the controller is not blinking. Thermostat green indication light not on, or LCD screen is blank.	Check thermostat first for either green indication light, or LCD display. If either of these does not appear, then check the controller for power (green blinking light). If no power is present, check 24VAC power with a multimeter. Cycle power to the controller. If this doesn't restore power, check the power that is feeding that controller for your problem.
Dampers don't move, and red FAULT light is illuminated.	Red fault light means there is a short in the cable from CW/CCW to COM. Find shorted cable(s) in that string of dampers and replace.
Damper acts erratically	If the CW/CCW lines in the cable are shorted together (and not shorted to the COMMON), it could cause the dampers in a string to act erratically and drive in random directions. Find bad cable(s) in the string, and replace.
24 VAC Binary Outputs not functioning	Ensure that the controller has 24VAC power. Ensure that there is a call for heating or for cooling, room lights, etc. If so, check to see that the GREEN indication light is on for the output. The next step would be to check the device that is triggering the output like a relay. Ensure that the relay has engaged (pulled in) for either heating or cooling application. Check the output configuration
Analog Outputs not functioning	Ensure that the PCM has 24VAC power. Check the analog output for voltage with a multimeter. You should see a voltage in the range of 0-10VDC. Direct Acting Output – 0VDC indicates that the field device is closed or at a minimum position. 10VDC indicates that the field device is open or at a full open position. Direct Acting is typical with cooling applications. Reverse Acting Output – 0VDC indicates that the field device is fully opened or maximum position, and 10VDC indicates fully closed or minimum position. Reverse acting is typical with heating applications.
SAT Sensor Analog Input not functioning	Ensure that there is a sensor wired to the input on the PIC controller. Check the type of sensor, should be a 10k Ohm Type Thermistor.
BACnet Communication Errors	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 make troubleshooting almost impossible. Correct polarity is imperative on MSTP 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. E.g. two wire conductor with black and white wires – black to the positive terminal, and white to the negative terminal. Keep this consistency throughout the network.

PCM - PLENUM PRESSURIZATION

MAINTENANCE

Troubleshooting - Continued

Fault	Solution
BACnet Communication Errors	Price does not use EOL or termination on their devices. Terminating a device is almost never required at the low baud rate of MS/TP devices. In fact terminating can create more problems than it solves. The network speed or baud rate must be the same throughout the network. **NOTE:** The default speed for Price BACnet MS/TP controls is 76800. BACnet MS/TP currently supports 4 standard speeds which are: 9600, 19200, 38400 and 76800.
BACnet Communication Errors	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 on the Addressable DIP switches on the PCM.
BACnet Communication Errors	Grounding and 24VAC 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 24VAC 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 on in the electrical box.
BACnet Communication Errors	**NOTE:** Flipping 24VAC 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!

PCM - PLENUM PRESSURIZATION

MAINTENANCE

Hardware Specifications

Power Requirements	24VAC, 47-63 Hz 6VA (not including output loading) NEC Class II
Ambient Ratings	32º to 131º F (0º to 55º C) 10 to 90% RH (non-condensing)
Outputs	24VAC Binary (x7). Max 0.5Amps each, Max 1.85A total switched HOT or switched COMMON Stages of heat or heat open/close (x3) • Fan • Cooling • Damper CW • Damper CWW Analog 0-10VDC (x4). Max: 10mA each. • Fan (ecm) • Heat • Cool • Aux
Inputs	0-10VDC analog inputs (x3) 0-5VDC sensor input (x1) Termistor inputs (x2) (10k Type J termistor) Contact closure (x1) (night setback) Thermostat inputs • Room Setpoint Dial • Temperature sensor (10K Type J Thermistor) • Accuracy of +/- 0.5°F from 55°F to 85°F (+/ 0.25°C from 13°C to 25°C
Communication ports	BACnet MS/TP Connection (optional) • Communication speeds: 9,600, 19,200, 38,400, 76,800 (default) • Maximum recommended devices per MS/TP segment: 30 LINKER port • For local setup using Price USB LINKER service tool
Actuator Specifications	40 in-lbs (nominal torque). 90 seconds running time 90º maximum angle of rotation. External slide knob for manual override. Less than 35 db (A) noise level.
Actuator Specifications	Mems technology Optional 0-1 SLM flow sensor. (0-1" W.C. equivalent) Not position sensitive.
Tubing Specifications	Flow Sensor tubing must be 1/4 inch outside diameter
Size	15.5 in. x 12.75 in. x 4 in.
Weight	15 lbs. (6.8kg)

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