Price Intelligent Controller
PIC Series
## PRICE INTELLIGENT CONTROLLER

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### SUPPORT ▼

Having difficulty installing this product?  
Price is here to help.

**Application Support**

204.654.5613  
controls@priceindustries.com  
priceindustries.com/literature
General

PIC - Price Intelligent Controller

The Price Intelligent Controller (PIC) is a direct digital controller for VAV terminals or fan coils that offers cutting edge zone control. The PIC combines the accuracy of direct digital control with the flexibility of an individual room control system, providing maximum control and efficiency. An advanced and configurable proportional integral controller allows for exceptional user comfort and energy efficiency. Installation of the controller and thermostat is simple and error proof with RJ-45 (network type) connections to the thermostat and BACnet network.

The PIC typically comes factory mounted to Price VAV boxes, but may also be ordered stand-alone for retrofit jobs.
The PIC controller is an advanced and fully configurable VAV terminal controller that can be used as either a pressure dependant or a pressure independent zone control system.

When used as a pressure dependant controller, the flow rate is dependant on inlet static pressure and damper position.

When used as a pressure independent controller, flow rate is constant with the use of the VAV Expansion Module (PIC-VAV) and airflow sensor. The PIC can be used as a stand alone unit, or can be interfaced into a BAS with MS/TP BACnet capability using the BACnet module (PIC-BAC). The PIC controller offers 5 thermostat options that provide a range of control from room temperature sensing, all the way to wireless control. With a variety of output configurations, the PIC controller can control analog heating and cooling valves, fan motors, and other types of analog devices. As well as On/Off heating and cooling stages, On/Off fan operation, fan coils, etc. With the use of the LCD Thermostat with Motion, the PIC can be used as a motion sensor and lighting controller with different levels of sensitivity, as well as system balancing tool.

**Expansion Modules**

The Price Intelligent Controller is also expandable for BACnet networking capabilities, and for Pressure Independent control. The expansion modules come equipped with a ribbon cable that is easy to plug in from the PIC to the selected module.

- PIC-VAV: VAV module (optional) provides airflow sensing for true VAV control.
- PIC-BAC: BACnet module (optional) provides a native BACnet MS/TP interface for networking.
24VAC Binary Outputs

| Fan Output | Binary Output for On/Off control of a fan, three types:  
|            | Intermittent - Fan runs when there’s a call for heating or cooling.  
|            | Day/Night - During the Day cycle the fan is on, during the Night cycle the fan is off.  
|            | Constant - Fan runs continuously  
| Stage 1    | Binary (electric, or binary hot water)  
|            | Tristate (floating) close signal of hot water valve  
| Stage 2    | Binary (electric, or binary hot water)  
|            | Tristate (floating) close signal of hot water valve  
| Stage 3    | Binary (electric, or binary hot water)  
|            | 24VAC PWM to SSR (10 second period)  
| Cool/Aux   | Binary Output for one stage of cooling if required. Can be used as an auxiliary binary output if required.  

Analog Outputs

| ECM AO1 | Analog Output for any type of modulating fan (0-10VDC, 2-10VDC, 10-2VDC, etc.)  
| AO2 Heat | Analog Output for modulating heating valve (0-10VDC, 2-10VDC, 10-2VDC, etc.)  
| AO3 Cool | Analog Output for modulating cooling valve (0-10VDC, 2-10VDC, 10-2VDC, etc.)  
| AO4 - Spare | Spare analog output - normally indicates damper position (0-10VDC = 0-100%)  

Inputs

| Contact Closure | Configurable Binary Input can be used for night setback, damper force open/close etc.  
| SAT Sensor | Analog Input for temperature probe hookup for heat/cool changeover if required. 10k Type J Thermistor  

Switched HOT/COM Jumper: PIC offers a jumper selectable HOT/COM switch that allows the binary output to be switched HOT or switched COMMON.

COM Terminals: All COM terminals on the PIC controller are internally connected, which allows for a common reference point throughout the board.

Damper Actuator: Factory installed and wired, the PIC offers LED indication of the damper direction, (either OPEN or CLOSE). Default drive time of the actuator is 90 seconds, but is configurable by using the LCD Thermostat.

NOTE: Drive time must match actuator being used; changing damper drive time does not make a 90 second actuator drive faster.

T-Stat RJ-45 Port: The PIC and thermostats comes equipped with an RJ-45 port to provide ease of plugging in a thermostat cable from the PIC to any of the selected thermostats. The thermostat cable is supplied by Price.

Service Port: The PIC comes equipped with an RJ-12 port to provide ease of plugging in an RJ-12 cable to connect an LCD setup tool for system balancing and setup. (LCD Setup tool only required for applications with dial, wireless or blank face thermostats for regular operation)
### Price - Flow Response Chart

<table>
<thead>
<tr>
<th>HCCO box</th>
<th>Cooling Min</th>
<th>Cooling Flows</th>
<th>Heating Min</th>
<th>Heating Flows</th>
<th>Neutral Supply Air Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI = Cooling</td>
<td></td>
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<tr>
<td>Duct Air = Cold</td>
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<tr>
<td>PI = Heating</td>
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<tr>
<td>Duct Air = Cold</td>
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<tr>
<td>PI = Neutral</td>
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<tr>
<td>Duct Air = Cold</td>
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</tr>
<tr>
<td>PI = Cooling</td>
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<tr>
<td>Duct Air = Hot</td>
<td>x</td>
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<tr>
<td>PI = Heating</td>
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<td>Duct Air = Hot</td>
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<td>PI = Neutral</td>
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<tr>
<td>Duct Air = Neutral</td>
<td>x</td>
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</tr>
</tbody>
</table>

**NOTE 1:** If no Temperature Probe is present, the PIC controller assumes cold duct air.

**NOTE 2:** PI = Proportional Integral = room load (either cooling/neutral/heating)

Above is a Flow Response chart for the PIC controller, showing the demand, Duct Air condition, and the controller’s output.

E.g. PI = Cooling, Duct Air = Cold, Output = Cooling Flows. This indicates that the Room Demand is in Cooling, the Duct Air is Cold, and the controller would modulate between the Cool Min and Cool Max values.

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**TECH TIP**

Use the above table to determine what airflows are being chased in certain modes.

Examples: If PIC is trying to heat the room (PI = heating) and cool air is being supplied (Duct air = Cold) it will chase its heating min flow.
Thermostat Overview

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 T-Stat 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 to 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.

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 T-Stat setup menus, free setup software using the Price LINKER, or through a BACnet system.
- The LCD Thermostat can be used as a balancing tool for the controller system by connecting the RJ-45 cable to the back of the thermostat.
- 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 T-Stat 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 thermostat can also be used as a motion sensor for occupied and unoccupied times in a space. It also has the capability to act as a lighting controller for occupied/unoccupied schedules.

NOTE: All thermostats are connected with a CAT-5 cable (RJ-45) connection from the PIC to the back of the selected thermostat. Each thermostat has an RJ-12 Service Port on the bottom, providing an interface for the LCD setup tool for setup and balancing, and without having to access the plenum.
The Price Wireless Thermostat System provides both sensor inputs and a point of control for Price controllers. The System consists of 2 units:

**WIRELESS REMOTE T-STAT** - Transmitter - Room sensor T-Stat with dial setpoint adjust, LED and push button.

**WIRELESS BASE** - Receiver - Unit with LCD and 3 push buttons.

REMOTE T-STAT and BASE units talk between each other wirelessly in the 2.4GHz range (FCC and IC certified). BASE unit connects to main controller using the supplied plenum-rated CAT-5 cable. No other connections are required.

**NOTE:** An LCD setup tool must still be used to setup and balance a PIC with the wireless thermostat option, the Wireless LCD base cannot access the PIC’s service menu.

---

**WIRELESS THERMOSTAT ▼**

**Base (Receiver) Mounted in Plenum**
- LCD Screen for menu display
- Increase and decrease push buttons for day temperature setpoint adjustment
- Service Port - Linker Connection
- Menu Button

**Remote (Transmitter) User Thermostat**
- Dial Adjustment for Temperature
- LED – 1 blink cooling mode, 2 – heating, 3 – neutral
- Occupancy Override Button
- Service Port - Linker Connection
Thermostat Installation

General Description

The PIC thermostats are all physically the same size and mounting instructions will be typical.

Location

1. The Price Intelligent Controller (PIC) Thermostats must be mounted to a wall and wired to the controller via the supplied plenum rated 35ft CAT-5 cable. This cable plugs into the thermostat and the PIC controller with the ease of RJ-45 connections. **NOTE:** the cable run can be extended to 70 ft using a Price Cable coupler and additional 35ft 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 direct blow onto the thermostat’s temperature sensor causing ‘bad’ 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. Connect the cable to the thermostat, then secure the thermostat onto the wall plate inserting top portion of the thermostat first, then snapping the bottom half in.

3. All thermostats will come equipped with a 0.050” Allen Key for the set screw at the bottom.

**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!

A thermostat whose cable has been kinked will display the message ‘Waiting for Link Check Wiring’

Thermostat cable product code: NETC35
Mounting Instructions

Mount the PIC by sliding the actuator U-bolt over the damper shaft. The back end of the PIC is secured by installing the white plastic keeper (tied to the actuator motor with an elastic band) with two sheet metal screws. This keeps the PIC from moving when the actuator is turning, but still allows it to “float” to avoid binding on the shaft if the controller were screwed firmly in place.

Rotate the damper shaft all the way in one direction (either clockwise or counter-clockwise) and then depress the gray pivot clutch on the actuator, located directly below the green terminal block, to unlock the actuator, and rotate it all the way in the same direction the shaft was rotated in.

Tighten the nuts on the U-bolt clamp and secure the actuator to the damper shaft.

Depress the clutch again and verify the actuator and shaft can rotate through the full 90° range of motion.

**NOTE:** It does not matter if you choose clockwise or counter-clockwise to rotate the shaft and actuator before tightening the nuts. The PIC will calibrate on power up. All that matters is that the damper shaft and actuator have the full 90° range of motion.

Connect any of the controller’s outputs as required.

**NOTE:** When the output loads require a switched HOT or COMMON 24VAC signal. Use the jumper near the FAN output to select HOT or COMMON outputs.

Power the PIC using 24VAC, the secondary 24VAC common of the transformer must be earth grounded, or power with Price PPM power module by plugging the supplied cables into the RJ-12 power jacks.
Wiring

Below is an example of a typical PIC sequence diagram - Single duct box with 3 stages of binary heat. Each PIC has a sequence pre-programmed at the factory, however many adjustments can be made in the field with an LCD thermostat.
Balancing Instructions
For more advanced setup details, please see ‘Display Navigation’ section.

Hold down the Menu button on the LCD Thermostat for 5 seconds until prompted for a passcode; use the UP, DOWN, UP, DOWN to enter the passcode.

The screen will now display “Service Menu: Application.”

Scroll down to the Balancing sub-menu.

Press the Menu button to enter this menu.

Screen will now show “Damper Override Disabled.” Press Menu, and now “Disabled” will be flashing; this means you can now scroll UP or DOWN with the arrow keys to select a target to send the damper to.

For most applications, you will want to select “Go To Cool Max,” and once selected, the thermostat will read the actual CFM (position) and target CFM as the damper tries to lock on to the cooling max airflow.

NOTE: If the target is zero, airflows must be entered in the VAV sub-menu – refer to page 18 of this manual.

Another option to override the damper is the “Flow Override” function. This will cause the damper to target any specific airflow that may not be a cooling or heating min/max flow.

When the screen is displaying “Flow Override,” press the Menu button and “No Override” will begin flashing. Press the UP arrow key to select a CFM value for the damper to target. Press Menu to select the value and press the DOWN arrow key to view the damper position vs target screen. The position should increase steadily until the target is reached.

NOTE: “Flow Override” must be set back down to “No Override” once complete.

Once the thermostat says that the position and target are the same, an airflow reading can now be taken from the air outlets. Compare your instrument’s reading to what the thermostat is reading for an airflow. Some adjustment may be required. Adjustments are made in the ‘Airflow Factor’ menu, or, depending on the version of the controller, the ‘Airflow Tweak’ menu.
For Controllers with Airflow Factor Menu

If any adjustment is required, press the 'DOWN' arrow key, the thermostat will now read 'AIRFLOW FACTOR' and will display its current CFM reading. Press the menu button and the CFM reading will change to display the current K factor, and the value will be flashing, indicating it is ready to be changed using the arrow keys.

Adjust the K factor by the percentage high or low that the balancing hood is reading versus the thermostat. For example, if the thermostat reads 250 CFM, but the balancer’s hood reads 300 CFM, then divide 250 by 300 to get 0.833, this means the controller is reading 83.3% of what the balancer’s hood is reading, so the K factor must be adjusted up. Supposing the box is an 8” inlet size, the K factor would be 890, so you would divide 890 by .833, and the new corrected K factor would be 1068.

K adjusted = K original / (CFM stat / CFM hood)

For Controllers with Airflow Tweak Menu

To make adjustments on controllers with airflow tweak instead of airflow factor, scroll to the airflow tweak menu. The screen will display the current CFM. Press the menu button and the CFM reading will change to a flashing ‘0%’.

Adjust the % by the percentage high or low that the balancing hood is reading versus the thermostat. For example, if the thermostat reads 250 CFM, but the balancer’s hood reads 300 CFM, follow the formula below to calculate the % higher or lower to offset the tweak.

Tweak = (1 / (CFM stat / CFM hood) - 1)*100

Now, the thermostat’s displayed CFM should much more closely match the hood’s CFM reading.

Tech Support - CALL 204 654-5613 option 4
control@priceindustries.com
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

**PIC 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. XXXXXXX**
Displays current Device Instance

**ROOM TEMP. 75.0°F**
(For example)

Changing the Setpoint – LCD & Motion Thermostat only

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

Down ▼

**DAY SETPOINT**
75.0°F

Up ▲

**DAY SETPOINT SAVING...**
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLICATION AIR TERMINAL</td>
<td>Single duct or fan powered terminal unit</td>
</tr>
<tr>
<td>OCCUPANCY ON VVT MODE</td>
<td>The Occupancy can be determined by airflow, contact closure, motion or by a user pressing a button</td>
</tr>
</tbody>
</table>
| NEUTRAL MODE LOAD 0% | Neutral mode mean PI controller is satisfied  
Cooling: -1 to -100%  
Heating: +1 to +100% |
| SUPPLY AIR TEMP 85.0°F | If no supply probe is present, LCD will display no probe  
If supply probe present, LCD will display temperature |
| DAMPER POSITION 50% | This indicates the current position of the damper is percent (%)  
Range is 0-100% (100% = full open or maximum air) |
| ECM OUTPUT 1.5 DVC | Current output on the AO1 |
| AIRFLOW 300 CFM | Only displayed if system is pressure independent (PIC-VAV module attached) |
| FLOW TARGET 300 CFM | Shows the current flow target in CFM (VAV) or % (VVT)  
**NOTE:** If damper position (above) is at 100% and CFM target is not being met, the box is STARVING for AIR |
| CO2 READING | The current CO2 reading in PPM (Parts Per Million) |
| HUMIDITY READING | The current humidity reading in RH% (relative humidity) |
| MAC ADDRESS 1 | Shows the BACnet MAC address. Range 1-99  
MAC Address can be set via dip in software switch, or in software with the LCD thermostat / setup tool  
If no BACnet module attached, LCD will display MAC address None |
| DEVICE INSTANCE 101 | (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:** Info menu will automatically time out after 20 seconds |
## Service Menu
**LCD Setup only**

Hold down 'Enter/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**.

<table>
<thead>
<tr>
<th>SERVICE MENU: APPLICATION</th>
<th>Change the Application the unit is operating as</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICE MENU: BALANCING</td>
<td>Allows you to force the damper open/close/min/max</td>
</tr>
</tbody>
</table>
| SERVICE MENU: VAV/VVT | Allows you to set flows or set limits  
For VAV (Air Terminal application only) - page 17  
For VVT (Air Terminal application only) - page 18  
For Exhaust Box VAV (Exhaust Box application only) - page 19  
For Dual Duct (Dual Duct application only) - page 20  
For Discharge Air Temp (Fan Coil applications only) - page 21  
For VAV with Flow Follower (Flow Follower application only) - page 22 & 23 |
| SERVICE MENU: SETPOINT | Setup of Setpoint limits (day minimum/maximum).  
°F/°C selection |
| SERVICE MENU: INPUT | Shows supply air temperature reading.  
Shows if VAV and BACnet modules are attached. |
| SERVICE MENU: OUTPUT | Allows setup of FAN, HEAT, COOL, outputs.  
Allows setup of room light output (motion stat only). |
| SERVICE MENU: BACNET | Allows setup of BACnet addresses  
MAC address, Device Instance Baud Rate  
Included only if BACnet module is attached |
| SERVICE MENU: 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 |
### Application 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR TERMINAL</td>
<td>For typical single duct and fan powered terminals units</td>
</tr>
<tr>
<td>FANCOIL 4 PIPE</td>
<td>Fan coil 4-pipe with hot and cold water</td>
</tr>
<tr>
<td>FANCOIL 2 PIPE</td>
<td>Fan coil 2-pipe with hot and cold changeover</td>
</tr>
<tr>
<td>DUAL DUCT</td>
<td>Dual duct terminal units with hot and cold inlets</td>
</tr>
<tr>
<td>EXHAUST BOX</td>
<td>Exhaust terminal unit typically with constant flow</td>
</tr>
<tr>
<td>SUPPLY &amp; EXHAUST TRACKING</td>
<td>Volumetric offset supply and exhaust applications</td>
</tr>
<tr>
<td>MIXING BOX DAT</td>
<td>Mixes airstreams to maintain a specific discharge air temp</td>
</tr>
<tr>
<td>CO2 TRACKING</td>
<td>Tracks airflow proportionally to the current CO2 in the occupied space</td>
</tr>
</tbody>
</table>

### TECH TIP

Depending on which application is selected, determines whether some menus will appear. Each menu item that is affected specifically states when it is visible.
### Balancing 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.

<table>
<thead>
<tr>
<th>BALANCING</th>
<th>DUAL DAMPER OVERRIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disabled - Default</td>
</tr>
<tr>
<td></td>
<td>Cold Setpoint, Hot Close - Cold deck chases setpoint, Hot deck closes</td>
</tr>
<tr>
<td></td>
<td>Cold Minimum, Hot Close - Cold deck goes to minimum, Hot deck closes</td>
</tr>
<tr>
<td></td>
<td>Cold Close, Hot Setpoint - Cold deck closes, Hot deck chases setpoint</td>
</tr>
<tr>
<td></td>
<td>Cold Close, Hot Minimum - Cold deck closes, Hot deck goes to minimum</td>
</tr>
<tr>
<td></td>
<td>50/50 Mixed - Cold deck and hot deck go to 50%</td>
</tr>
<tr>
<td></td>
<td>Cold Open, Hot Close - Cold deck opens, Hot deck closes</td>
</tr>
<tr>
<td></td>
<td>Cold Close, Hot Open - Cold deck closes, Hot deck opens</td>
</tr>
<tr>
<td></td>
<td>Both Full Open - Cold and hot deck both open</td>
</tr>
<tr>
<td></td>
<td>Both Full Close - Cold and hot deck both close</td>
</tr>
</tbody>
</table>

| COLD FLOW TWEAK | (Only visible if the application is Dual Duct) | Adjust Cold flow reading by +/- 100% |
| HOT FLOW OVERRIDE | (Only visible if the application is Dual Duct) | Adjust Hot flow reading by +/- 100% |
| MAIN BOX TWEAK | (Only visible if the application is Flow Follower) | Adjust main box flow reading by +/- 100% |
| AIRFLOW TWEAK/ FOLL WER TWEAK | (Only visible if the application is Flow Follower) | Adjust follower flow reading by +/- 100% airflow tweak |

Continue to next page...
Balancing 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.

Continued from previous page...

FLOW OVERRIDE
NO OVERRIDE

This menu allows you to put in a CFM value that you want to target and check out the VAV damper, and if the air handler is pushing enough air to the box. Eg. Set the Flow Override value to 200 CFM and hit Enter, then hit the Down arrow button to view the current damper position and the target of the damper. If the position gets to 200 CFM, then there is enough air pushing to the VAV box.

NOTE: Once complete with the Flow Override check, put this value back to zero or No Flow Override.

AIRFLOW FACTOR

This value is the actual CFM flowing across the crossflow sensor and through the box. From here, push the menu button once, and this will display the current K factor value for that box. Eg. 8" box = 890 K factor. You can adjust this factor if required. See example in Balancing section, page 11 of this manual.

PRESS MENU TO EXIT
**VAV Menu**  
*(Pressure independent mode)*

Scroll through menu with Up and Down keys. Press ‘Enter/Menu’ button to apply your changes. *---Saving---* will display as your changes are applied.

| VAV | DUCT SIZE 8 INCHES | Allows selection of inlet size (4", 5", 6", 7", 8", 9", 10", 12", 14", 16")  
|     | NOTE: Changing duct size will load the default min/max airflow for that size |
| FLOW UNITS | CFM | Choose between liters per second or cubic feet per minute |
| COOL MIN FLOW | 132 CFM | Sets the cool min flow. Must be lower than (or same as) cool max flow |
| COOL MAX FLOW | 800 CFM | Sets the cool max flow. Must be higher than (or same as) cool max flow |
| HEAT MIN FLOW | 132 CFM | Sets the heat min flow. Must be lower than (or same as) heat max flow |
| HEAT MAX FLOW | 800 CFM | Sets the heat max flow. Must be lower than (or same as) heat min flow |
| NEUTRAL FLOW | 132 CFM | Sets the neutral flow. Independent with no limits |
| UNOCCUPIED DAMPER POSITION | 40% | When the PIC is unoccupied, the damper will rest at this position.  
Default - 40% (Range 0-100%) 100% = full open  
CFM default - 132 cfm. |
| DAMPER RUNTIME | 95 SEC | Change the total runtime of the damper (this changes the time that the PIC applies the open/close signal to the actuator, but cannot make the actuator run faster) |
| DAMPER DIRECTION | NORMAL | Changes which direction open and close are set to |
| DAMPER CALIBRATION | | Normal - damper will calibrate on startup  
No Cal Mode - damper will not calibrate on startup |
| DAY FLOW TRIP | 66 CFM | PIC will go into occupied mode when CFM reading is equal or greater than this value  
Default: 1/2 the box minimum flow |
| NIGHT FLOW TRIP | 33 CFM | PIC will go into unoccupied mode when CFM reading is equal or greater or less than this value  
AND damper is starved at 100%  
Default: 1/4 the box minimum flow |
| AIRFLOW NSB | DISABLED | Enabled - occupied and unoccupied modes triggered by airflow.  
(If enabled day flow trip & night flow trip trigger occupied/unoccupied mode)  
Disabled - occupied and unoccupied modes not triggered by airflow.  
Normal - uses the Flow Chart to determine the damper target.  
Duct Temp Use PI - this feature ignores the Flow Chart and uses the PI to determine the damper target.  
Eg. PI is in cooling mode, damper will target Cooling Min and Max flows. |
| FLOW RESPONSE | | |
VVT Menu
(Pressure dependent mode)

Scroll through menu with Up and Down keys. Press 'Enter/Menu' button to apply your changes. "---Saving---" will display as your changes are applied.

- **COOL MIN FLOW**: Cool min flow in %
  - Range: 0-100%
  - Default: 10%

- **COOL MAX FLOW**: Cool max flow in %
  - Range: 0-100%
  - Default: 10%

- **HEAT MIN FLOW**: Heat min flow in %
  - Range: 0-100%
  - Default: 10%

- **HEAT MAX FLOW**: Heat max flow in %
  - Range: 0-100%
  - Default: 100%

- **NEUTRAL FLOW**: Sets the neutral flow
  - Range: 0-100%
  - Default: 10%

- **UNOCCUPIED DAMPER POSITION - 40%**: When PIC is unoccupied, the damper will rest at this position.
  - Default - 40% (Range 0-100%)
  - 100% = full open
  - CFM default - 132 cfm.

- **DAMPER RUNTIME 95 SEC**: Change the total runtime of the damper.

- **DAMPER DIRECTION NORMAL**: Changes which direction open and close are set to

- **FLOW RESPONSE**: Normal - uses the Flow Chart to determine the damper target.
  - Duct Temp Use PI - this feature ignores the Flow Chart and uses the PI to determine the damper target.
  - Eg. PI is in cooling mode, damper will target Cooling Min and Max flows.

- **PRESS MENU TO EXIT**
EXHAUST BOX VAV

**EXHAUST CONFIG**
- **CONST VOLUME**
  - Constant volume - PIC will try to maintain a constant volume
  - Track Analog Signal - PIC will maintain a volume proportional to an analog signal

- **DUCT SIZE 8 INCHES**

- **FLOW UNITS CFM**
  - Choose between liters per second or cubic feet per minute

- **EXHAUST MIN FLOW 132 CFM**
  - Minimum airflow to be maintained, corresponds to input Signal minimum

- **EXHAUST MAX FLOW 800 CFM**
  - Maximum airflow to be maintained, corresponds to input Signal maximum

- **INPUT SIGNAL MIN 00 VDC**
  - Minimum analog signal, corresponds to input exhaust minimum flow

- **INPUT SIGNAL MAX 100 VDC**
  - Maximum analog signal, corresponds to input exhaust maximum flow

- **CONSTANT VOLUME SETPOINT**
  - 1000 cfm default

- **UNOCCUPIED DAMPER POSITION - 40%**
  - When PIC is unoccupied, the damper will rest at this position.
  - Default - 40% (Range 0-100%) 100% = full open
  - CFM default - 132 cfm.

- **AIRFLOW NSB ENABLED**
  - Enabled - occupied and unoccupied modes triggered by airflow.
  - (If enabled day flow trip & night flow trip trigger occupied/unoccupied mode)
  - Disabled - occupied and unoccupied modes not triggered by airflow.

- **DAMPER RUNTIME 95 SEC**
  - Change the total runtime of the damper

- **DAMPER DIRECTION NORMAL**
  - Changes which direction open and close are set to

- **DAY FLOW TRIP 66 CFM**
  - PIC will go into occupied mode when CFM reading is equal or greater than this value
  - Default: 1/2 the box minimum flow

- **NIGHT FLOW TRIP 33 CFM**
  - PIC will go into unoccupied mode when CFM reading is equal or greater or less than this value
  - AND damper is starved at 100%
  - Default: 1/4 the box minimum flow

- **DAMPER CALIBRATION**
  - Normal: Allows the damper to calibrate on start up
  - No Cal: Disables damper calibration on startup

- **PRESS MENU TO EXIT**

---

**PRICE INTELLIGENT CONTROLLER**

**DISPLAY NAVIGATION**

Exhaust Box VAV Menu
(Application specific 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.
Scroll through menu with Up and Down keys. Press ‘Enter/Menu’ button to apply your changes. "---Saving---" will display as your changes are applied.

<table>
<thead>
<tr>
<th>DUAL DUCT VAV Menu</th>
<th>Constant Volume - Maintains a constant volume as set in constant Volume setpoint Variable Volume - Varies volume between Hot/Cold Deck min/max flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUAL DUCT TYPE</td>
<td>Constant Volume - Maintains a constant volume as set in constant Volume setpoint Variable Volume - Varies volume between Hot/Cold Deck min/max flows</td>
</tr>
<tr>
<td></td>
<td>NOTE: Changing duct size will load the default min/max airflow for that size</td>
</tr>
<tr>
<td>FLOW UNITS CFM</td>
<td>Choose between liters per second (L/s) or cubic feet per minute (cfm)</td>
</tr>
<tr>
<td>CONSTANT VOLUME SETPOINT 800 CFM</td>
<td>Sets the constant airflow to maintain</td>
</tr>
<tr>
<td>COLD DECK MIN FLOW 132 CFM</td>
<td>Minimum cold deck flow to maintain</td>
</tr>
<tr>
<td>COLD DECK MAX FLOW 800 CFM</td>
<td>Maximum cold deck flow to maintain</td>
</tr>
<tr>
<td>HOT DECK MIN FLOW 132 CFM</td>
<td>Minimum hot deck flow to maintain</td>
</tr>
<tr>
<td>HOT DECK MAX FLOW 800 CFM</td>
<td>Maximum hot deck flow to maintain</td>
</tr>
<tr>
<td>UNOCCUPIED DAMPER POSITION 40%</td>
<td>When PIC is unoccupied, the damper will rest at this position. Default - 40% (Range 0-100%) 100% = full open CFM default - 132 cfm.</td>
</tr>
<tr>
<td>DAMPER RUNTIME 95 SEC</td>
<td>Change the total runtime of the damper</td>
</tr>
<tr>
<td>DAY FLOW TRIP 66 CFM</td>
<td>(Active if Airflow NSB is enabled) PIC will go into occupied mode when CFM reading is greater than or equal to this value. Default: 1/2 the box minimum flow</td>
</tr>
<tr>
<td>NIGHT FLOW TRIP 33 CFM</td>
<td>(Active if Airflow NSB is enabled) PIC will go into occupied mode when CFM reading is less than or equal to this value AND damper is starved at 100%. Default: 1/4 the box minimum flow</td>
</tr>
<tr>
<td>AIRFLOW NIGHT SETBACK</td>
<td>Enabled - occupied and unoccupied modes triggered by airflow If enabled dat flow trip &amp; night flow trip trigger occupied/unoccupied mode Disabled - occupied and unoccupied modes not triggered by airflow</td>
</tr>
<tr>
<td>DAMPER DIRECTION NORMAL</td>
<td>Changes which direction open and close are set to</td>
</tr>
<tr>
<td>DAMPER CALIBRATION</td>
<td>Normal: Allows the damper to calibrate on start up and after every 500 movements No Cal: Disables damper calibration on startup and after every 500 movements</td>
</tr>
</tbody>
</table>

Press Menu to exit
VAV with Supply Exhaust Tracking Menu

(Application specific 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.

- **DUCT SIZE 8 INCHES**
  - **NOTE:** Changing duct size will load the default min/max airflow for that size

- **EX. DUCT SIZE 8 INCHES**
  - **NOTE:** Changing duct size will load the default min/max airflow for that size

- **FLOW UNITS CFM**
  - Choose between liters per second or cubic feet per minute

- **COOL MIN FLOW 132 CFM**
  - Minimum cooling flow

- **COOL MAX FLOW 800 CFM**
  - Maximum cooling flow

- **HEAT MIN FLOW 132 CFM**
  - Heat minimum flow

- **HEAT MAX FLOW 800 CFM**
  - Heat maximum flow

- **NEUTRAL FLOW 132 CFM**
  - Flow when controller is satisfied

- **EXHAUST OFFSET 0 CFM**
  - Applies an offset to the exhaust flow

- **UNOCCUPIED DAMPER POSITION - 40%**
  - When PIC is unoccupied, the damper will rest at this position.
  - Default - 40% (Range 0-100%) 100% = full open
  - CFM default - 132 cfm.

Continue to next page...
VAV with Follower Menu
(Application specific 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.

Continued from previous page...

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNOCCUPIED DAMPER POSITION 40%</td>
<td>When PIC is unoccupied damper will &quot;rest&quot; at this position</td>
</tr>
<tr>
<td></td>
<td>Range: 0-100% Default: 40% (Reminder: 100% = full open)</td>
</tr>
<tr>
<td>DAMPER RUNTIME 95 SEC</td>
<td>Change the total runtime of the damper</td>
</tr>
<tr>
<td>DAMPER DIRECTION NORMAL</td>
<td>Changes which direction open and close are set to</td>
</tr>
<tr>
<td>DAMPER CAL NORMAL</td>
<td>Damper reads after a set number of movements (Normal is Default)</td>
</tr>
<tr>
<td></td>
<td>(No Cal Mode) The damper remains direct flow but assumes the damper position</td>
</tr>
<tr>
<td>DAY FLOW TRIP 66 CFM</td>
<td>PIC will go into occupied mode when CFM reading is equal or greater than this value</td>
</tr>
<tr>
<td></td>
<td>Default: 1/2 the box minimum flow</td>
</tr>
<tr>
<td>NIGHT FLOW TRIP 33 CFM</td>
<td>PIC will go into unoccupied mode when CFM reading is equal or less than this value AND damper is starved at 100%</td>
</tr>
<tr>
<td></td>
<td>Default: 1/4 the box minimum flow</td>
</tr>
<tr>
<td>AIRFLOW NSB ENABLED</td>
<td>Enabled - occupied and unoccupied modes triggered by airflow (if enabled day flow trip &amp; night flow trip trigger occupied/unoccupied mode)</td>
</tr>
<tr>
<td></td>
<td>Disabled - occupied and unoccupied modes not triggered by airflow</td>
</tr>
<tr>
<td>FLOW RESPONSE</td>
<td>Normal - uses the Flow Chart to determine the damper target.</td>
</tr>
<tr>
<td></td>
<td>Duct Temp Use PI - this feature ignores the Flow Chart and uses the PI to determine the damper target.</td>
</tr>
<tr>
<td></td>
<td>Eg. PI is in cooling mode, damper will target Cooling Min and Max flows.</td>
</tr>
</tbody>
</table>
Setpoint Menu
(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**
  - 65.0°F
  - This is the lowest setpoint allowed.
  - Range: 10.0°F - 100.0°F
  - Default: 65.0°F

- **SET HIGH LIMIT**
  - 80.0°F
  - 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**
  - 62.0°F
  - PIC will maintain this heating setpoint when unoccupied.
  - Range: 10.0°F - 100.0°F
  - Default: 62.0°F

- **NIGHT COOL SET**
  - 83.0°F
  - PIC will maintain this cooling setpoint when unoccupied.
  - Range: 10.0°F - 100.0°F
  - Default: 83.0°F

- **PROPORTIONAL BAND**
  - 2.0°F
  - Default 2°F, 1°C
  - Proportional Band is the range of control or the throttling range of the device.

- **DAY DIFFERENTIAL**
  - 1.0°F
  - Default 1°F, 0.5°C
  - Day Differential is the deadband on either side of the setpoint.

- **PI DAMPER**
  - NORMAL PI
  - PI Damper - sets the proportional/integral response of the damper.
  - Normal PI - Damper responds in normal PI mode during heating, cooling or neutral mode.
  - Low Range PI - Damper will respond in the low range of the PI from 0-50% during heating, cooling or neutral mode.
  - Hi Range PI - Damper will respond in the high range of the PI from 50-100% during heating, cooling or neutral mode.

- **PI ANALOG HEAT**
  - NORMAL PI
  - PI Analog Heat - sets the proportional/integral response of the Analog Heating output - A02.
  - Normal PI - Heating output responds normally during a call for heat from 0-100%.
  - Low Range PI - Heating output responds during the low range of the PI from 0-50%.
  - Hi Range PI - Heating output responds during the high range of the PI from 50-100%.

- **PI ANALOG COOL**
  - NORMAL PI
  - PI Analog Cool - sets the proportional/integral response of the Analog Cooling output - A03.
  - Normal PI - Cooling output responds normally during a call for heat from 0-100%.
  - Low Range PI - Cooling output responds during the low range of the PI from 0-50%.
  - Hi Range PI - Cooling output responds during the high range of the PI from 50-100%.

- **PI ECM HEAT**
  - NORMAL PI
  - PI ECM Heat - sets the proportional/integral response of the Analog ECM Fan output- A01, during a call for heating.
  - Normal PI - Analog Fan output responds normally from 0-10VDC during a call for heat.
  - Low Range PI - Analog Fan output operates from 0-10VDC during the Low Range of the Analog Heat output.
  - Hi Range PI - Analog Fan output operates from 0-10VDC during the High Range of the Analog Heat output.

Continue to next page...
Setpoint Menu Continued
(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.

Continued from previous page...

PI ECM Cool - sets the proportional/integral response of the Analog ECM Fan output- A01, during a call for cooling.
Normal PI - Analog Fan output responds normally from 0-10VDC during a call for cooling.
Low Range PI - Analog Fan output operates from 0-10VDC during the Low Range of the Analog Cool output.
Hi Range PI - Analog Fan output operates from 0-10VDC during the High Range of the Analog Cool output.
Discharge Air Temperature Menu

(Application specific 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.

- **Assume H2O Type Peeking**
  - Peeking - Currently checking to determine Hot/Cold water
    - Hot
    - Cold

- **H2O Temperature Detect Dynamic**
  - Dynamic: When water temperature is below room temp it is considered cooling. When water temperature is above room temp it is considered heating. This mode is recommended because PIC will always use the supply air if it can help satisfy the room load
  - Conventional, Force Cool, Force Heat: Conventional uses Hot and Cold switch points. Force Cool, Force Heat always assumes cold or hot. These modes are not recommended
  - Hot Switch - Only visible when H2O - Temperature Detect = Conventional

- **Hot Switch**
  - 81.0°F

- **Cold Switch**
  - 73.0°F

- **Discharge Air Temp. No Probe**
  - Current temperature of the probe mounted to water pipe

- **DAT Cool Setpoint**
  - 55.0°F

- **DAT Heat Setpoint**
  - 90.0°F

- **DAT While PI is in Deadband 0.0°F**

- **DAT Service Time**
  - 60 sec

- **DAT Step Division**
  - 10

- **DAT Step Maximum**
  - 10%

- **DAT Differential**
  - 2.0°F

- **Peek Min Time**
  - 5 min

- **Peek Fan Speed**
  - 21%

- **Peek Occurance**
  - 360 min

- **Press Menu to Exit**

---

PIC will consider the supply air warm if at the hot switch temp or above
Default: 0.0°F - uses dynamic neutral mode (neutral mode disabled)

PIC will consider the supply air cold if at the cold switch temp or below
Default : 0.0°F - uses dynamic neutral mode (neutral mode disabled)

Cooling setpoint

Heating Setpoint

What the temperature will be maintain when the system is satisfied

DAT will calculate and move the valve every 60 seconds (default)

Distance a single step travels (leave at default 10)

Maximum change a call for heating or cooling can make during a step

The range that the controller is satisfied and will not make adjustments

Minimum amount of time controller will open the valve to check if system is heating or cooling

The fan speed during the peek time

The moment the valve is shut, this timer will start counting down. When it expires, the controller will open the valve to check on the water temperature.
Input Menu

(Supply air temperature and neutral mode)

Scroll through menu with Up and Down keys. Press ‘Enter/Menu’ button to apply your changes. "---Saving---" will display as your changes are applied.

**SUPPLY AIR TEMPERATURE**

Shows current SAT reading if probe connected
Range: -59.0°F - 300.0°F
No probe, means no sensor is connected

**NEUTRAL MODE**

Dynamic

When supply air temperature (SAT) is below room temperature it is considered cooling.
When supply air temperature (SAT) is above room temperature it is considered heating.
**This mode is recommended** because PIC will always use the supply air if it can help satisfy the room load.

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

**HOT SWITCH**

81.0°F

Hot Switch - Only active/visible when Neutral Mode = Conventional
PIC will consider the supply air warm if at hot switch temp or above.
Default: 0.0 DegF - uses dynamic neutral mode (Neutral mode disabled)

**COLD SWITCH**

73.0°F

Cold Switch - Only active/visible when Neutral Mode = Conventional
PIC will consider the supply air cold if at cold switch temp or below.
Default: 0.0 DegF - uses dynamic neutral mode (Neutral mode disabled)

**VAV MODULE**

Attached - VAV Module is being used and sensing airflow.
Not Attached - VAV Module is not attached or disabled in software.

**PRESSURE TYPE VAV**

Auto

Pressure Type - not visible if application is Fancoil 2 pipe or Fancoil 4 pipe
VAV Auto: VAV module is being used and sensing airflow.
WT Manual: VAV module Disabled in software (Override)
WT Auto: no VAV module - VVT Mode

**ROOM TEMPERATURE OFFSET - 0.0F**

Apply an offset to the room temperature.

**SAT OFFSET - 0.0F**

Apply an offset to the SAT temperature.

**CONTACT CLOSURE CONFIGURATION**

All Output Halt - disables all output
Disable Binary Cool
Disable Binary Heat
Disable Binary Fan
Disable AO4
Idle Analog Cool - default 0 VDC
Idle Analog Heat - default 0 VDC
Idle Analog ECM - default 1.5 VDC
Damper full close
Damper full open - Default
Occupied when closed - Forces occupied
Unoccupied on closed - Forces unoccupied
Not used - Disabled

Continue to next page...
**Input Menu Continued**
*(Supply air temperature and neutral mode)*

Scroll through menu with Up and Down keys. Press ‘Enter/Menu’ button to apply your changes. *‘---Saving---’* will display as your changes are applied.

Continued from previous page...

<table>
<thead>
<tr>
<th>CO2 SENSOR DETECTED</th>
<th>Indicates that the CO2 sensor is connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 TWEAK 0%</td>
<td>Percentage that the CO2 reading can be tweaked if required. Default is 0%</td>
</tr>
<tr>
<td>CO2 OFFSET 0 PPM</td>
<td>Value to offset CO2 reading if required. Default is 0 PPM</td>
</tr>
<tr>
<td>CO2 PURGEMODE ENABLED</td>
<td>This feature is only active when the CO2 and humidity thermostat is connected to the PIC controller. Purge mode is enabled here</td>
</tr>
<tr>
<td>PURGE AIRFLOW 800 CFM</td>
<td>Set purge airflow to desired cfm - 800 cfm is default</td>
</tr>
<tr>
<td>MAX CO2 LEVEL 1000 PPM</td>
<td>PIC controller will initiate purge ode above this value. Default CO2 setting is 1000 ppm</td>
</tr>
<tr>
<td>NOMINAL CO2 800 PPM</td>
<td>PIC controller will purge until nominal CO2 level is met. Default is 800 ppm. Nominal CO2 is your target CO2</td>
</tr>
<tr>
<td>HUMIDITY SENSOR DETECTED</td>
<td>Indicates that the Humidity (RH) sensor is connected</td>
</tr>
<tr>
<td>HUMIDITY TWEAK 0%</td>
<td>Percentage that the RH reading can be tweaked if required. Default is 0%</td>
</tr>
<tr>
<td>HUMIDITY OFFSET 0%RH</td>
<td>Value to offset RH reading if required. Default is 0%RH</td>
</tr>
<tr>
<td>PRESS MENU TO EXIT</td>
<td></td>
</tr>
</tbody>
</table>
Output Menu - FAN
(Setup of fan 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.

- ECM COOL MIN
  - 2.1 VDC
  - PI cooling min (-1 to -100%) output voltage
  - Default 2.1 VDC

- ECM COOL MAX
  - 8.0 VDC
  - PI cooling max (-100%) output voltage
  - Default 8.0 VDC

- ECM HEAT MIN
  - 2.1 VDC
  - PI heating min (+1 to +100%) output voltage
  - Default 2.1 VDC

- ECM HEAT MAX
  - 8.0 VDC
  - PI heating max (+100%) output voltage
  - Default 8.0 VDC

- ECM DEADBAND
  - 1.5 VDC
  - PI in neutral/deadbond (0%) Output voltage defaults to 1.5 VDC

- ECM UNOCCUPIED
  - 1.5 VDC
  - Unoccupied voltage for ECM motor
  - Default = 1.5 VDC (Fan Off)

- BINARY FAN TYPE
  - This controls the binary FAN output
  - Constant = fan output always on

- FAN TYPE HEAT & COOL
  - Fan is on when PI is heating or cooling (+1 to +100% or -1 to -100%) (Day & night mode)

- FAN TYPE DAY & 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% or -1 to -100%)

- FAN TYPE CONTINUOUS
  - Fan is always on

- FAN TYPE DAY & NIGHT HEAT
  - During the day, fan is always on
  - During the night, the fan is only on when PI is heating (+1 to +100%)

- FAN TYPE HEATING
  - Fan on when PI heating (+1 to +100%) (Day & night mode)

- FAN TYPE NO FAN
  - Fan output disabled
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, Hot Water, Binary/PWM, Hot Water/PWM
  - Binary uses Stage 1, 2, 3 - Default
  - Hot water uses Stage 1 & 2 for Open/Close
  - Binary/PWM and Hot Water/PWM -- Stage 3 is PWM
  - Bin-HotAirDis - Binary reheat outputs are disabled when hot air is sensed at the inlet
  - H.W.HotAirDis - Hot Water reheat output is disabled when hot air is sensed at the inlet
  - BinPWM-HtArDs - Binary/PWM reheat output is disabled when hot air is sensed at the inlet
  - HW/PWM-HtArDs - Hot Water/PWM reheat output is disabled when hot air is sensed at the inlet
  - **Reheat Disable** - Reheat outputs are disabled

- **Drive Time**: 90 SECONDS
  - Hot water runtime in seconds
  - Not shown if BINARY heat is used

- **Heat Stage 1**: 33%
  - Heat Stage 1 Trip Point: Stage 1 engages at 33% heating
  - Not shown if hot water heat is used

- **Heat Stage 2**: 66%
  - Heat Stage 2 Trip Point: Stage 2 engages at 66% heating
  - Not shown if hot water heat is used

- **Heat Stage 3**: 100%
  - Heat Stage 3 Trip Point: Stage 3 engages at 100% heating

- **Reheat Fail Safe**: Off
  - Off - Outputs send 24VAC 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

- **AF Interlock**: Disabled: (Default) this means the controller will enable the heat as normal. Enabled: when enabled, the heating outputs will not energize until at least 87.5% of the Minimum Heating Flow is sensed at the cross-flow sensor
Output Menu - Cool

(Setup of fan 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.

**OUTPUT**

**OUTPUT FAN**

**OUTPUT HEAT**

**OUTPUT COOL**

- **Binary Cool Trip Point:** Cooling engages at 33% cooling load

- **Analog Cool Min:** Outputs this voltage on cool analog pin when there is a minimum call for cooling

- **Analog Cool Max:** Outputs this voltage on cool analog pin when there is a maximum call for cooling

- **Analog Cool Idle:** Outputs this voltage on cool analog pin when there is no call for cooling

- **Cool Aux Type Cool Output:** Only visible if the application is Fancoil 2 Pipe or Fancoil 4 Pipe
  
  Cool Output - Uses the Cool output to control cooling in a 2 pipe configuration
  
  HCCO valve - Heating Cooling Change Over valve

**OUTPUT ROOM LIGHTS**

**PRESS EXIT TO MENU**

---

 exterprise.com | PRICE INTELLIGENT CONTROLLER - Manual 31
Output Menu - Room Lights

(Setup of 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.

**NOTE:** The room lights option will override the selected output to control a 24VAC relay which is intended to control lighting. Use a spare output so there is no conflict with your current sequence of operations.
MAC SET IN:
HARDWARE

Hardware – uses DIP switch on BACnet module for MAC Address
Software – uses STAT to set MAC Address – this OVERRIDES the hardware switches

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.

LINK MAC TO DI

Enabled – this makes the last 2 digits of the device instance address the MAC address
Disabled – this allows the last 2 digits of the device instance to be something other than the MAC address

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
Stat Setup Menu

(Stat options)

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

**STAT SETUP**

**OCCUPANCY 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

**HVAC TIMEOUT 240 MINUTES**
- PIC will go into unoccupied after no motion is detected and this timer expires
  - Default: 240 minutes

**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 use only) – not recommended

**DISPLAY OPTIONS**

**TEMP AND SETUP**
- See Display Options menu on next page

**CONTROLLER NAME**
- Set a custom name for that Stat. See page 32 for details

**PRESS MENU TO EXIT**
## PRICE INTELLIGENT CONTROLLER

### DISPLAY NAVIGATION

**Display Options 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.

<table>
<thead>
<tr>
<th>DISPLAY OPTIONS</th>
<th>TEMP AND SETUP</th>
<th>SETPOINT ONLY</th>
<th>ROOM TEMP ONLY</th>
<th>CONTROLLER NAME SETPOINT ENABLE</th>
<th>CONTROLLER NAME SETPOINT DISABLE</th>
<th>NAME TEMP SETPOINT ENABLE</th>
<th>NAME TEMP SETPOINT DISABLE</th>
<th>NAME AND SETPOINT</th>
<th>TEMP AND HUMIDITY</th>
<th>HUMIDITY ONLY</th>
<th>CO2 ONLY</th>
<th>CO2 AND HUMIDITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMP AND SETUP</td>
<td>Displays only the current temperature, allows users to change the local setpoint</td>
<td></td>
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</tr>
<tr>
<td>SETPOINT ONLY</td>
<td>Displays only the current setpoint</td>
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</tr>
<tr>
<td>ROOM TEMP ONLY</td>
<td>Displays only the current temperature, prevents users from changing the local setpoint</td>
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</tr>
<tr>
<td>CONTROLLER NAME SETPOINT ENABLE</td>
<td>Displays the T-Stats custom name and allows users to change the local setpoint</td>
<td></td>
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<tr>
<td>CONTROLLER NAME SETPOINT DISABLE</td>
<td>Displays the T-Stats custom name and prevents users to change the local setpoint</td>
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</tr>
<tr>
<td>NAME TEMP SETPOINT ENABLE</td>
<td>Displays the T-Stats custom name and local temperature, allows users to change the local setpoint</td>
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<tr>
<td>NAME TEMP SETPOINT DISABLE</td>
<td>Displays the T-Stats custom name and local temperature, prevents users to change the local setpoint</td>
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<tr>
<td>NAME AND SETPOINT</td>
<td>Displays the T-Stats custom name and the current setpoint</td>
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<tr>
<td>TEMP AND HUMIDITY</td>
<td>Displays the T-Stats current temperature and humidity</td>
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<tr>
<td>HUMIDITY ONLY</td>
<td>Displays only the current humidity and allows user to change the local setpoint</td>
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<tr>
<td>CO2 ONLY</td>
<td>Displays only the current CO2 and allows user to change the local setpoint</td>
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</tr>
<tr>
<td>CO2 AND HUMIDITY</td>
<td>Displays the current CO2 and humidity while allowing user to change the local setpoint</td>
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</tbody>
</table>
BACnet Wiring

Price PIC controllers, when selected with the optional BACnet interface, have the option of using supplied 35’ CAT 5 cables to run BACnet MS/TP, or field supplied cable hardwired into a pluggable terminal block (see next page if using hardwired BACnet connections). The RJ-45 jacks for use with the supplied BACnet cables are directly tied to the pluggable terminal block, and so any combination of supplied cables and hardwired connections can be used on a single network segment.

BACnet networks must be run in a daisy chain configuration, meaning there is only one main cable and each network device is connected directly along its path, with no more than 30 devices per segment, and MS/TP segment lengths must not exceed 1050 feet.

Termination

BACnet MS/TP networks must be terminated to ensure proper operation. A network should be terminated twice, once at the beginning and once at the end. Termination helps reduce reflections and noise. The terminating can be done with a 100 ohm resistor across the + and - lines. Most Price controllers have the option for enabling termination via a DIP switch #8 or by a software menu selection. Turning on termination via software will enable the resistor across the lines and also turn on a green LED labeled “TRM”.

Tech Tip: The Price BACnet MS/TP to IP Router has built in termination and it is enabled by default (since the router is typically the beginning of the entire MS/TP network). Now you only have to go and find/terminate that last device.

Electrical Noise

Electrical noise can affect both analog signal and digital communications such as BACnet. Therefore do not route high voltage lines next to the BACnet network! Avoid noisy electrical sources such as:

- Variable Frequency Drives
- High current power lines (main panel feeds)
- Fluorescent light fixtures

If you must pass near noisy electrical lines cross at right angles. This will help reduce the amount of noise coupled to the network wires.
Use Price supplied CAT-5 cables for BACnet whenever possible. If not possible to use Price supplied cables, follow these wire specifications.

Network Wire Specifications
For the BACnet MS/TP network specific wire is required. Do not use standard power or “thermostat” wire. This wire does not have the necessary requirements for digital communications. While it’s possible it may work (temporarily) the network will be unreliable and not operating at optimal performance.

BACnet MS/TP Wire type recommendations
- Use 2 balanced twisted pairs, one for + and -, one for NET COM
- Low capacitance (17pF or less)
- Plenum rated (FT6, CMP ratings)
- 100-120 ohm, Balanced
- (CAT5, CAT5E, CAT6 network cable has excellent specifications and will work in almost any BACnet MS/TP application.)
- **Price controllers use the Orange Compliment for (+), the Orange for (-), and the Brown and Brown Compliment together for the (NET COM) connections. These are paired in a standard CAT5E cable.** Pre-terminated CAT5 cables are available from Price. Model code: NETC35 (35 ft plenum rated cable, terminated with RJ45 plugs, 568-B standard)
BACnet Service Menu

Each controller’s MAC address, Device Instance, and Baud rate are set in the BACnet sub-menu of the service menu accessed through an LCD thermostat or LCD setup tool. For information on how to select a MAC address and Device instance for any controller on a network, see following pages.

To set the controller’s BACnet settings, enter the Service Menu and adjust settings as follows:

**NOTE:** When the screen displays a flashing value, that value is ready to be changed and can be adjusted by pressing the arrow keys. Pressing Menu will save the value.

1. Hold down the **Menu** button on the LCD Thermostat for 5 seconds until prompted for a passcode; use `a` and `c` to enter the passcode; **DOWN, UP, UP, DOWN**.

2. The screen will now display “Service Menu: Application.”

3. Scroll down to the BACnet sub-menu.

4. Press the **Menu** button to enter this menu.

5. Screen will now show ‘MAC set in Hardware’, this is a default setting that means the physical DIP switched on the BACnet board must be set to set the MAC address. For easier setup, Price recommends setting the MAC over software which will override the DIP switch settings.

6. Use the up arrow to scroll to whatever MAC you are intending to set this controller to, once you arrive at the number, press Menu to save.

7. By default, the MAC address will appear as the last 2 digits of the device instance. This can be changed so that the MAC is completely independent of the device instance by changing ‘Enabled’ to ‘Disabled’. If there is no specific need to do this, Price recommends leaving it enabled (for Price PRTUs systems and most other scenarios, there is no need to switch to disabled).
The device instance defaults to 100, but will be displayed with the last 2 digits as the MAC if the previous screen was set to enabled. Press Menu then use the arrow keys to change the device instance.

**NOTE:** Each Menu press will change allow changes in different tiers of the device instance (so that you don’t have to scroll for extended periods to get into the millions range – supposing that’s where you need to set your device instance).

The baud rate is the speed that the MS/TP network runs at. EVERY device on the network must run at the same speed. Price controllers are defaulted to a baud rate of 76800, but can be changed to 38400, 19200, or 9600. For a network segment with all Price controllers (including Price PRTU systems), it’s recommended that the baud rate be left at 76800.

*Choose lower baud rates only when integrating with devices by other manufacturers whose maximum speed is lower than 76800 (eg. 38400).

Once all settings are made, scroll down to press Menu to exit, and press Menu. The controller will then re-start, this is because all BACnet info is only read once at startup. If you had left the MAC set in hardware, and adjusted the DIP switch settings to set the MAC address, you would have to manually restart the controller by cycling 24 VAC power for the new MAC address to take effect (setting through software makes the restart happen automatically however).
Setting the MAC Address:

MAC (media access control) must be UNIQUE on an MS/TP network segment within building. An installer setting up an MS/TP segment must ensure each device has a UNIQUE MAC Address (Range 1-99). The MAC Address is set through the LCD thermostat or LCD setup tool.

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

---

**NETWORK SEGMENT #1 ▼**

---

**NETWORK SEGMENT #2 ▼**

---

**TECH TIP ▼**

24 VAC power HOT and COMMON polarities are critical and must not be reversed on ANY devices! Reverse polarity will stop communication on that MS/TP segment. All 24 VAC transformers must be grounded on their secondary side for BACnet to work.

NET COM wire must be connected at each device and is critical for BACnet network reliability.

Use one twisted pair for + and -, and another twisted pair for NET COM for optimal noise cancellation.
Setting the Device Instance (Coupled MAC and DI)

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 LCD setup 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Default Value (Factory)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC Address</td>
<td>6</td>
<td>Value: limited to 1-99</td>
</tr>
<tr>
<td>Tier 1 (x100)</td>
<td>58</td>
<td>Value: limited to 0-99</td>
</tr>
<tr>
<td>Tier 2 (x10,000)</td>
<td>1</td>
<td>Value: limited to 0-99</td>
</tr>
<tr>
<td>Tier 3 (x1,000,000)</td>
<td>0</td>
<td>Value: limited to 0-4</td>
</tr>
</tbody>
</table>

Example Device Instance setup with Default settings:

- MAC Address = 6 (6 x 1 = 6) – Set 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 = 0,015,806

**TECH TIP**

When using a PIC controller with a DIAL thermostat, the you must purchase a setup tool in AIO known as LCD-SETUP and use this to configure the PIC controller. Remember, all settings are stored in the PIC controller and not the thermostat.
Setting the Device Instance (De-coupled MAC and DI)

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 LCD setup 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Example Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 (x01)</td>
<td>4</td>
<td>Value: limited to 1-99</td>
</tr>
<tr>
<td>Tier 2 (x100)</td>
<td>58</td>
<td>Value: limited to 0-99</td>
</tr>
<tr>
<td>Tier 3 (x10,000)</td>
<td>1</td>
<td>Value: limited to 0-99</td>
</tr>
<tr>
<td>Tier 4 (x1,000,000)</td>
<td>0</td>
<td>Value: limited to 0-4</td>
</tr>
</tbody>
</table>

Example Device Instance setup with Default settings:

- **TIER 1 = 4** (4 x 1 = 4) – Set through software
  + **TIER 2 = 58** (58 x 100 = 5800) – Set through software
  + **TIER 3 = 1** (1 x 10,000 = 10,000) – Set through software
  + **TIER 4 = 0** (0 x 1,000,000 = 1,000,000) – Set through software

=

**Final Device Instance = 0,015,806**

0 01 58 04
Tier4 Tier3 Tier2 Tier1
Multiplier Multiplier Multiplier Multiplier
Troubleshooting

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

<table>
<thead>
<tr>
<th>Fault</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIC controller appears to be not responding or have no power.</td>
<td>Check thermostat first for either green indication light, or LCD display. If either of these does not appear, then check the PIC 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.</td>
</tr>
<tr>
<td>Damper acts erratically</td>
<td>Check actuator mounting; ensure that the damper is fully closed when the actuator is in the fully closed position. Pivot the grey release clutch on actuator and move by hand. Ensure that the set screw on the damper shaft is torqued down tight and no slipping is occurring. Also, ensure the 3 wires in the actuator itself are wired correctly. Green to COM, red to CW, and yellow to CCW.</td>
</tr>
<tr>
<td>Airflow readings not as specified</td>
<td>On PIC controllers ordered with VAV module option, ensure that the tubing is correct. Red tube from the Price SP300 sensor to the HI Port on the transducer, and the Green tube from the SP300 to the Lo Port on the transducer. Also, ensure that the tubes are fully over the barbed fitting on the sensor, and that the tubes are not pinched in any way. Check inlet size of duct and ensure that size is correctly set in the controller. <strong>NOTE:</strong> The STAT does not store the duct size, it is stored in the PIC.</td>
</tr>
<tr>
<td>24VAC Binary Outputs not functioning</td>
<td>Ensure that the PIC has 24VAC power. Ensure that there is a call for heating or for cooling, if so, check to see that the indication lights is on for the output. The next step would be to check the device that is triggered the output like a relay. Ensure that the relay has engaged (pulled in) for either heating or cooling application. The next item to check for would be the Hot/COM jumper on the PIC. Make sure that if you’re switching the Hot side, that the jumper is on the Hot, likewise for switching a common, ensure the jumper is on the COM.</td>
</tr>
</tbody>
</table>
## Troubleshooting - Continued

<table>
<thead>
<tr>
<th>Fault</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Outputs not functioning</td>
<td>Ensure that the PIC 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 in the minimum position. 10VDC indicates that the field device is open or in the maximum 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.</td>
</tr>
<tr>
<td>SAT Sensor Analog Input not functioning</td>
<td>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.</td>
</tr>
<tr>
<td>BACnet Communication Errors</td>
<td>BACnet</td>
</tr>
<tr>
<td></td>
<td>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. Eg. 2 wire conductor with black and white wires – black to the positive terminal, and white to the negative terminal. Keep this consistency throughout the network.</td>
</tr>
</tbody>
</table>
Troubleshooting - Continued

The following information is provided in the even that the Price Intelligent Controller (PIC) does not appear to function properly after installation.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Solution</th>
</tr>
</thead>
</table>
| BACnet Communication Errors   | BACnet MS/TP networks must be terminated to ensure proper operation. A network should be terminated twice, once at the beginning and once at the end. Termination helps reduce reflections and noise. The terminating can be done with a 100 ohm resistor across the A+ and B- lines, but most Price controllers have the option for enabling termination by flipping dip switch #8 to the ON position. 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. |

<table>
<thead>
<tr>
<th>BACnet Communication Errors</th>
<th>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 binary Addressing scheme for the existing network. The Address is set on the Addressable dip switches on the PIC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACnet Communication Errors</td>
<td>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 &quot;common/neutral&quot; wire of the SECONDARY side of the transformer to earth ground – such as the ground screw on in the electrical box.</td>
</tr>
</tbody>
</table>
| 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! |
## PRICE INTELLIGENT CONTROLLER

### MAINTENANCE

#### Hardware Specifications

<table>
<thead>
<tr>
<th><strong>Power Requirements</strong></th>
<th>24VAC, 47-63 Hz 6VA (not including output loading) NEC Class II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient Ratings</strong></td>
<td>32º to 131º F (0º to 55º C) 10 to 90% RH (non-condensing)</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>24VAC Binary Output. Max 0.5Amps each, MAX 1.85A total Switched HOT or Switched COMMON</td>
</tr>
<tr>
<td></td>
<td>• Fan</td>
</tr>
<tr>
<td></td>
<td>• Stages of heat or heat open/close (x3)</td>
</tr>
<tr>
<td></td>
<td>• Cooling</td>
</tr>
<tr>
<td></td>
<td>• Damper CW</td>
</tr>
<tr>
<td></td>
<td>• Damper CCW</td>
</tr>
<tr>
<td></td>
<td>Analog 0-10VDC (x4). Max: 10mA each</td>
</tr>
<tr>
<td></td>
<td>• Fan (ECM)</td>
</tr>
<tr>
<td></td>
<td>• Heat</td>
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<tr>
<td></td>
<td>• Cool</td>
</tr>
<tr>
<td></td>
<td>• Aux</td>
</tr>
<tr>
<td><strong>Inputs</strong></td>
<td>Thermistor Sensor (10k Type J thermistor)</td>
</tr>
<tr>
<td></td>
<td>Analog 0-10V inputs (x2). 20k ohm input impedance</td>
</tr>
<tr>
<td></td>
<td>• Thermostat Inputs</td>
</tr>
<tr>
<td></td>
<td>• Room Setpoint Dial</td>
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<tr>
<td></td>
<td>• Temperature Sensor (10K Type J Thermistor)</td>
</tr>
<tr>
<td></td>
<td>• Accuracy of +/- 0.5°F from 55°F to 85°F (做出了 0.25°C from 13°C to 25°C)</td>
</tr>
<tr>
<td><strong>Communication ports</strong></td>
<td>BACnet MS/TP Connection (optional)</td>
</tr>
<tr>
<td></td>
<td>• Communication speeds: 9,600, 19,200, 38,400, 76,800 (default)</td>
</tr>
<tr>
<td></td>
<td>• Maximum recommended devices per MS/TP segment: 30 devices</td>
</tr>
<tr>
<td></td>
<td>• For local setup using Price USB LINKER service tool</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>11&quot; x 5.75&quot; x 2.75&quot;</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1.8lb. (816g)</td>
</tr>
</tbody>
</table>