SIEMENS

BACnet PTEC Controller

VAV with AO Heat Modulation and CO2 Monitoring

Start-up Procedures

140-1153
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Building Technologies

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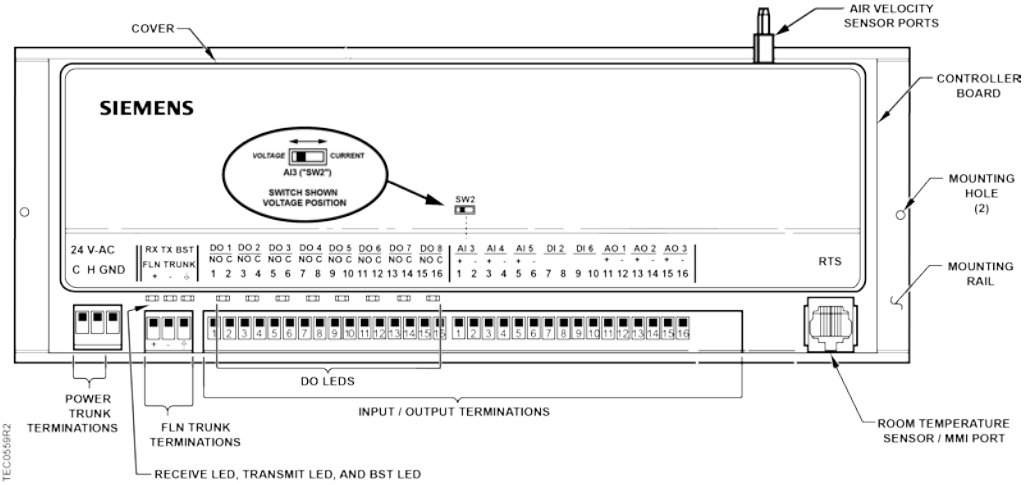
Before You Begin

NOTE:
For information on applications with Firmware Revision B*x*40 or earlier, see InfoLink and/or Asset Portal for documentation.

NOTE:
WCIS version 4.0 or later must be used to configure and auto-address Siemens BACnet MS/TP Equipment Controllers.

If you need metric units and the controller is communicating through the MS/TP driver in the field panel, uncheck the Metric check box. The conversion must be handled in the field panel.



Generic Controller I/O Layout. See *Wiring Diagram* for application specific details.

NOTE:
Digital Room Units (Firmware Revision 26 and later) will update their controlled inputs without putting them Out Of Service. However, a command from an external source through the digital room unit will put the associated BACnet Input point Out Of Service.

Communication and DO Indicators

The Siemens BACnet PTEC VAV with CO2 Monitoring & Floating or AOV Heating Controller has LEDs to indicate communication (yellow) and DO (digital output) status BST (yellow).

The RX LED will flash for data packets received by the controller from the MS/TP network. The TX LED will flash for data packets sent by the controller to the MS/TP network. Each DO has an associated LED located above its termination point. This LED point is on when the associated DO is commanded ON; otherwise, it is OFF.

The BACnet PTEC will automatically detect the MS/TP baud rate at start up and will communicate with other devices when configured as a master MS/TP device (address 1 through 127). The TX LED will start flashing as it attempts to communicate with other devices.

Room Unit Identification

- For Analog Room Units – The revision number is visually identified by its case.
- For Digital Room Units (Firmware Revision 25 or earlier) – The revision number displays for 5 seconds when the room unit is first powered up. These room units will display `laptop` when a laptop is connected and will no longer update room temperature sensor values.
- For Digital Room Units (Firmware Revision 26 and later) – The revision number displays for 5 seconds when the room unit is first powered up or when a laptop is disconnected. These room units will continue to display and update the room temperature sensor values when a laptop is connected.

Enabling Actuators

⚠ CAUTION

The controller's DOs control only 24 Vac loads.
The maximum rating is 12 VA for each DO.

The points that determine actuator run times are:

- MTR1 TIMING
- MTR2 TIMING
- MTR3 TIMING

1. Use the following table(s) to set run time(s) for the actuator(s) used by your application.
2. For damper rotation angles other than 90°, set DMPR ROT ANG to the appropriate value.

Damper Actuator Run Time		
Damper Actuator	**Setting (seconds)**	
	50 Hz	**60 Hz**
GDE 131.1 (floating control)	108	90
GLB 131.1 (floating control)	150	125
GDE 161.1 (0 to 10V control)	108	90
GLB 161.1 (0 to 10V control)	150	125
PTS4 electronic-to-pneumatic transducer from ACT	-	90

Valve Actuator Run Time		
Valve Actuator	Setting (seconds)	
	50 Hz	60 Hz
SSB81U, floating control fail-in-place	180	150
SSC81U, floating control fail-in-place	150	125
SSC81.5U, floating control fail-safe	125	125
SQS85.53U, floating control spring return	35	30
SSB61U, 0-10V proportional fail-in-place	75	75
SSC61U, 0-10V proportional fail-in-place	30	30
SSC61.5U, 0-10V proportional fail-safe	25	25
SQS65U, 0-10V proportional fail-in-place	35	30
SQS65.5U, 0-10V proportional fail-safe (SR)	35	30
PTS4 electronic-to-pneumatic	-	90

Specifying Motor Setup

NOTE:
When MTR SETUP is changed, all enabled actuators will calibrate. Wait until each actuator has completed its calibration before continuing.

In this application, the value of MTR SETUP determines the type, not the number, of output control signals generated by the application. The output signals for MODHTG1 COMD and MODHTG2 COMD can be floating or 0 to 10V analog. Use the additive values in the *Motor Enable/Reverse Values for MTR SETUP* table, along with the output signal logic in the *MTR SETUP Values and Corresponding Output Signals* table, to arrive at the MTR SETUP value needed for your job.

The MTR SETUP values are additive. For example, if you needed Motor 1 (DOs 1 and 2) enabled, Motor 2 (DOs 3 and 4) enabled, and Motor 3 (DOs 5 and 6) disabled, you would set MTR SETUP equal to 5. This is because the Motor 1 (for the damper) enable value is 1, the Motor 2 enable value is 4, and the Motor 3 disable value is 0. 1 + 4 + 0 = 5. In this case, you would have a floating signal for damper (DOs 1 and 2), heating (DOs 3 and 4), and a 0 to 10V analog signal for cooling (AOV1).

NOTE:
If Motor 2 (DO 3 and 4) is being used for floating point control of a valve for heating, then AOV 1 is spare. In this case, although AOV 1 is spare, AOV 1 OPEN and AOV 1 CLOSE are not used for control of the output for this spare analog. Likewise, if Motor 3 is being used for second heating stage, AOV 2 would be spare but AOV 2 OPEN and AOV 2 CLOSE would not be used for control of AO 2 output.
If AOs are used for modulating heating/cooling devices, the associated DOs are spare but unavailable for motor control.

Verifying Actuator Setup

1. Command all actuators closed. Verify that they close and remain closed. If not, adjust the setting for MTR SETUP according to Table *MTR SETUP Values*.
2. If any of the actuators still do not close completely, then the actuators have been installed or set up incorrectly. See the Siemens BACnet PTEC VAV with CO2 Monitoring & Floating or AOV Heating Controller Installation Instructions (550-142), the iKnow Troubleshooting Tool, or contact Field Support.

Setting the Application

Add the PTEC to your job database and select one of the following applications.

Application Description	Application Number
VAV with CO2 Monitoring and AOV or Floating Point Heating	6680
VAV with CO2 Monitoring, Series Fan and AOV or Floating Point Heating	6681
VAV with CO2 Monitoring, Parallel Fan and AOV or Floating Point Heating	6682
VAV Slave Mode	6698

After you set the application, the controller goes through a shut-down/load sequence as it switches to the application selected. After the application loads, the calibration cycle begins.

Setting Voltages to Open and Close 0 to 10V Actuators

If AOV control is used for modulating a valve instead of floating control, the open/close voltages must be set. Otherwise, this section can be skipped.

1. Set AOV 1 OPEN to the voltage that fully opens the modulating heating device connected to AOV 1.
2. Set AOV 1 CLOSE to the voltage that completely closes the modulating heating device connected to AOV 1.

3. Set AOV 2 OPEN to the voltage that fully opens the modulating heating device connected to AOV 2. (If an SCR is connected to AOV 2, then AOV 2 OPEN is the voltage that causes the SCR to be fully on.)
4. Set AOV 2 CLOSE to the voltage that completely closes the modulating heating device connected to AOV 2. (If an SCR is connected to AOV 2, then AOV 2 CLOSE is the voltage that causes the SCR to be fully off.)

NOTE:
The maximum voltage output for an AO is 10V. The controller will not control the modulating devices beyond 10V.

Air Velocity Sensor Calibration

The air velocity sensor calibration cycle takes from 2 to 5 minutes to complete. The air damper closes during calibration. At the start of the calibration cycle, the controller automatically sets the point CAL AIR to YES. When the cycle is complete, it sets CAL AIR to NO.

NOTE:
For a controller used without an Autozero Module, the damper is commanded closed to get a zero airflow reading during calibration. For a controller used with an Autozero Module, calibration occurs without closing the damper.

Wait until the calibration cycle is complete (CAL AIR is set to NO) before continuing with this startup procedure.

Selecting Automatic Calibration Option

1. Using the following table, set CAL SETUP to the value that best meets your job requirements.
2. If appropriate, change CAL TIMER from the default of 12 hours. This setting applies only if your choice for CAL SETUP includes Option 4.

NOTE:
The air velocity sensor should be calibrated at least once every 24 hours. Make sure that the sensor has been calibrated before balancing takes place, as this will affect the balancer’s results.

CAL SETUP Options.	
CAL SETUP (value)	**Description**
0	Calibration occurs ONLY when the point CAL AIR is set to **YES**.
1	Calibration occurs when the field panel commands a day/night mode changeover. Actual calibration is subject to a time delay of 0, 1, 2, or 3 minutes. This delay is determined by the point CTLR ADDRESS divided by 4. The remainder is the time delay in minutes. **Example:** If CTLR ADDRESS = 11, then the controller will wait 3 minutes (11 ÷ 4 = 2 R3) after it receives the day/night mode changeover command before beginning the calibration routine.
2	Calibration occurs immediately after the override switch is pressed.
4 (factory default value)	Calibration occurs on the time interval set in the point CAL TIMER. **Example:** If CAL TIMER = 12, then the calibration period is 12 hours. Actual calibration is subject to a time delay based on the value of CTLR ADDRESS. See the example in Option 1.

NOTE:
Options can be combined by summing their numbers. For example, to calibrate in Options 1 and 2, set CAL SETUP to **3**.

Setting Room Temperature Setpoints (Digital and Analog Room Units)

Set the following basic control temperature setpoints:

- Day (or OCC) cooling setpoint: DAY CLG STPT (default 74°)
- Day (or OCC) heating setpoint: DAY HTG STPT
- Night (or UOC) cooling setpoint: NGT CLG STPT
- Night (or UOC) heating setpoint: NGT HTG STPT

If STPT DIAL is set to NO, CTL STPT will use the above setpoint depending on the HEAT.COOL mode and the day/night mode.

Setting STPT SPAN

Set STPT SPAN = 0 for Room Unit setpoint use as standard (absolute values for example, 74 F). For configurations for warmer/cooler (per *Selecting Options for Room Unit Setpoints*), set STPT SPAN = 1 degree or greater (for example, STPT SPAN = 2 will allow -2 to +2 degrees from the current heating or cooling setpoint).

Selecting Options for Room Unit Setpoints

In addition to the base room temperature setpoints that should be entered above, when STPT DIAL = YES, the following options are provided for room units using Standard/Absolute or Warmer/Cooler temperature setpoints, depending on the room unit provided.

The following sections provide the setup configurations based on desired room unit setpoint option:

- Standard/Absolute Setpoints Mode (Digital Room Units [→ 10])
- Warmer/Cooling Setpoints Mode (Digital Room Units [→ 10])
- Standard/Absolute Setpoints Mode (Analog or Digital Room Units [→ 11])
- Warmer/Cooling Setpoints Mode (Analog Room Units) [→ 13]

NOTE:
For all of these configurations, if a zero shift of setpoint is desired or specified when changing from heating to cooling, set DAY CLG STPT = DAY HTG STPT. This may not be in compliance with various energy and control standards.

Standard/Absolute Setpoint Mode (Digital Room Unit)

Digital Room Unit (2200/2300 Series Firmware Revision 26 and later)

The setpoint value entered on the room unit will be equal to the RM STPT DIAL and will be used for CTL STPT.

1. Set STPT DIAL = **YES**.
2. Set STPT SPAN = **0**.
3. Set SENSOR SEL = **1** (additive value)
   Enables Room Unit Temperature and setpoint options. Other room unit options can then be added as needed. See *Setting SENSOR SEL*.
4. Set RM STPT MIN and RM STPT MAX to a limit range for setpoint adjustment.
5. Set DAY CLG STPT and DAY HTG STPT to the initial values to be used by the room unit and to establish the heating/cooling setpoint and shift.

Configuration values used by the digital room unit are sent from the points configured above in the PTEC and do not need to be individually entered into the room unit. These include, SET PT MIN, SET PT MAX and SEL PT DIS (display option).

Example

DAY CLG STPT = 74, DAY HTG STPT = 70

In cooling mode, the current room setpoint in RM STPT DIAL displays when you press a setpoint UP/DOWN button. You can change the displayed value and the RM STPT DIAL value within the min/max limits.

When you press the UP button to the new cooling setpoint of 78 (an increase from the base cooling setpoint of plus 4 degrees), it will be displayed in RM STPT DIAL. When the controller switches to heating mode, the RM STPT DIAL will display the DAY HTG STPT, also offset by plus 4 degrees (74).

In this Standard/Absolute configuration, the value of RM STPT DIAL will display the actual control setpoint.

Warmer/Cooler Setpoint Mode (Digital Room Unit)

Digital Room Unit (2200/2300 Series Firmware Revision 26 and later)

NOTE:
The revision number displays for 5 seconds when the room unit is first powered up or when a laptop is disconnected.
Digital Room Units (Firmware Revision 26 and later) will continue to display and update the room temperature sensor values when a laptop is connected.

The room unit setpoint shift (warmer/cooler) will be used to set the RM STPT DIAL temperature and will be used for CTL STPT.

1. Set STPT DIAL = **YES**.
2. Set STPT SPAN = **1** (or greater).
3. Set SENSOR SEL = **1** (additive value)
   Enables Room Unit Temperature and setpoint options. Other room unit options can then be added as needed. See *Setting SENSOR SEL*.
4. Set RM STPT MIN and RM STPT MAX to a limit range for setpoint adjustment.
5. Set DAY CLG STPT and DAY HTG STPT to the initial values to be used by the room unit and to establish the initial heating/cooling setpoint shift.

Configuration values used by the digital room unit are sent from the points configured above in the PTEC and do not need to be individually entered into the room unit. These include, SET PT MIN, SET PT MAX and SEL PT DIS (display option).

Example

DAY CLG STPT = 74, DAY HTG STPT = 70; STPT SPAN = 2

In cooling mode, this warmer/cooler configuration, when you press the UP or DOWN button, the graphic display will indicate the current shift, if any. You can change the graphic display two steps UP or DOWN. You press UP (warmer) by two steps (maximum shift allowed with the setup). The RM STPT DIAL will display the new cooling setpoint of 76; (a shift from the base cooling setpoint of 2 degrees). When the controller switches to heating mode, the RM STPT DIAL will display the DAY HTG STPT, also offset by plus 2 degrees (72), while the room unit graphic display will maintain its + 2 shift.

RM STPT DIAL value will be limited to RM STPT MIN and RM STPT MAX values.

In this warmer/cooler configuration, the value of RM STPT DIAL will display the actual control setpoint.

Standard/Absolute Setpoint Mode (Analog or Digital Room Unit)

Analog (1000 Series) or Digital Room Units (Firmware Revision 25 or earlier)

NOTE:
The revision number displays for 5 seconds when the room unit is first powered up.

For the configuration for these devices, the CTL STPT is an offset calculation from the value set on the room unit. This offset is established by the difference between the DAY CLG STPT and the DAY HTG STPT. The value on the RM STPT DIAL, as set by the room unit, is the midpoint of this offset.

1. Set STPT DIAL = **YES**.
2. Set STPT SPAN = **0**.
3. Do one of the following:
   - Digital Room Unit: Set SENSOR SEL = **1** for Digital Room units (additive value)
     Enables Room Unit Temperature and setpoint options. Other room unit options can then be added as needed. See *Setting SENSOR SEL*.
   - Analog Room Unit: Set SENSOR SEL = **0** for Analog Room units (additive value)
     Disables Digital Room Unit Temperature and setpoint options. Other sensor select options for type of thermistor used can then be added as needed. See *Setting SENSOR SEL*.
4. Set RM STPT MIN and RM STPT MAX to limit range for setpoint adjustment.
5. Set DAY CLG STPT and DAY HTG STPT to establish the heating/cooling deadband only (actual value are not used to establish CTL STPT).

Example

DAY CLG STPT = 74, DAY HTG STPT = 70

This provides a setpoint deadband of 4 degrees.

In either cooling or heating mode, the RM STPT DIAL will display the value set by the room unit (limited by RM STPT MIN and MAX).

- In cooling mode, CTL STPT will be RM STPT DIAL + 0.5 * setpoint deadband
- In the heating mode, CTL STPT will be RM STPT DIAL – 0.5 * setpoint deadband

Example

When the user selects a setpoint on the room unit of 78 degrees it will be displayed in RM STPT DIAL. However, the control setpoint will be offset from this value. In cooling mode, CTL STPT will be 78 + 2 = 80 degrees, and in heating mode CTL STPT will be 78-2 = 76 degrees.

The displayed temperature setpoint on the room unit and the value of RM STPT DIAL will display MID POINT of the actual control setpoints.

Warmer/Cooler Setpoint Mode (Analog Room Unit Only)

Analog Room Unit (1000 Series)

The room unit setpoint shift (warmer/cooler) will be used to set the RM STPT DIAL temperature and will be used for CTL STPT.

1. Set STPT DIAL = **YES**.
2. Set STPT SPAN = **1** (or greater).
3. Set SENSOR SEL = **0** (additive value)
   Disables Digital Room Unit Temperature and setpoint options. Other sensor select options for type of thermistor used can then be added as needed. See *Setting SENSOR SEL*.
4. In this option, RM STPT MIN and RM STPT MAX are not used to limit setpoint range (this is accomplished by the STPT SPAN adjustment).
5. Set DAY CLG STPT and DAY HTG STPT to the initial values to be used by the room unit and to establish the initial heating/cooling setpoint shift.

The analog room unit setpoint slider is mapped to + and – the STPT SPAN configured.

When the slider is at mid point, there is no shift in cooling or heating setpoint used by CTL STPT and displayed in RM STPT DIAL.

Example

DAY CLG STPT = 74, DAY HTG STPT = 70; STPT SPAN = 4

In cooling mode, In this warmer/cooler configuration, when the user moves the slider half way up to the top (a 2 degree shift), the CTL STPT and RM STPT DIAL will display the new cooling setpoint of 76 (a shift from the base cooling setpoint of 2 degrees). When the controller switches to heating mode, CTL STPT and RM STPT DIAL will display the DAY HTG STPT also offset by plus 2 degrees (72) while the slide remains at the previous position.

In this warmer/cooler configuration, the value of RM STPT DIAL will display the actual control setpoint.

Setting SENSOR SEL

SENSOR SEL is a configurable, enumerated point (values are additive). This point tells the controller what type of room unit is being used and how to handle loss of data. It also provides the ability to enable the optional RH, and CO2 sensors and which thermistor type is connected.

Room Temperature, Setpoint, RH and CO2

- When the digital room unit (Series 2200/2300) is used, SENSOR SEL selects the source temperature and setpoint and enables a loss of communications indication:
  - Temperature/Setpoint enable and supervision for fail communications (temperature) with a value of 1.
  - Relative humidity enable and supervision for fail communications with a value of 2.

  - CO2 enable and supervision for fail communications with a value of 4.
- When the analog room unit (Series 1000/2000) is used, default temperature sensing (0) from an analog room unit is enabled (relative humidity and CO2 sensing are not available and should not be selected).

Thermistor Inputs

- Default for either input is 10K.
- To enable 100K thermistor on input, see the following table for additive values of 8 or 16.

Other Inputs (only available on Digital Room Unit)

- Use the following table to select and enable communications supervision of room temperature/setpoint dial, relative humidity or CO2 for additive values of 1, 2 and 4.

SENSOR SEL Value * (additive)	Description (include values to enable feature)
1	Select Digital Room Unit (for temperature sensing and setpoint dial)
2	Relative Humidity (RH) sensing
4	CO_2 sensing
8	If short board: 100K Ω thermistor on AI 3 (else input is 10K Ω) If long board: 100K Ω thermistor on AI 5 (else input is 10K Ω)
16	Long board only: 100K Ω thermistor on AI 4 (else input is 10K Ω)

Room DEW POINT

When the SENSOR SEL enables the relative humidity sensor, the controller will calculate a DEW POINT for information and use when the application is adopted (PPCL) for chilled ceiling configurations. Calculations will be based on valid (or overridden) values of the control temperature (CTL TEMP) and room humidity (RM RH).

Setting CO2 CONFIG

This option is provided to specify the source for the CO2 Sensor. Default input (AI 3) is selected when CO2 CONFIG = 3.

Setting AI 3 For CO2 Sensor

1. Set CO2 CONFIG =**3** (default).
2. Set CO2 SCALE to the value, in PPM, represented by a sensor reading of 10V or 20 mA. This input is displays in the RM CO2 point.
3. Set the Dip switch (located on the circuit board) to indicate the sensor type, either to current or voltage.
4. To disable use of AI 3 for CO2 input/calculation and allow AI 3 to be used as a spare, set CO2 CONFIG = **0**.

Setting Room Unit For CO2 Sensor

1. Set CO2 CONFIG =**1**. Room unit will update the value in the RM CO2 point.
2. CO2 SCALE is not used when the CO2 sensing is from the room unit.
3. Set SENSOR SEL (per *Setting SENSOR SEL*) with additive value of 4 to allow the room unit to update RM CO2 with the sensed value.
4. AI 3 (or DI 3) can be used as a spare.

Setting HC.ENDIS

HC.ENDIS determines whether the application is heating only, cooling only, or if it uses both heating and cooling modes. Set HC.ENDIS to the desired value.

- 3 = heating and cooling (default)
- 1 = heating only
- 2 = cooling only

Setting Override Time

If using night/unoccupied override, set OVRD TIME to the number of whole hours that an override should last. If OVRD TIME equals 0 (default), this feature is disabled.

Setting the Number of 0 - 10V Heating Devices

MODHTG COUNT determines the number of 0 – 10 Volt heating device that the TEC is controlling. These heating devices can be either modulating heating valves or SCRs. When used, these devices are connected to AOV1 and AOV2.

If there are no heating devices connected to AOV1 or AOV2, set MODHTG COUNT to **0**. If there is a heating device connected to AOV1, but not AOV2, set MODHTG COUNT to **1**. If there is a heating device connected to AOV1 and AOV2, then set MODHTG COUNT to **2**.

NOTE:
If you set MODHTG COUNT to a value greater than 2, then MODHTG COUNT will display as 0 when viewed on the screen, and the application will control as though MODHTG COUNT was set to 0.

This application cannot directly control an SCR. It can only control an SCR provided that the SCR has a built-in controller that will modulate the SCR based on a 0 – 10 Volt input signal. If this is the case, then the application can control the SCR by connecting either AOV1 or AOV2 on the TEC to the 0 – 10 Volt input on the controller that resides on the SCR.

Setting Duct Area

If provided, enter the duct area (sq ft or sq m) into DUCT AREA and continue to *Setting Flow Coefficient*.

If you do not know the duct area, use the following table:

Area =	Round Duct	Rectangular Duct
Area in Sq. Ft.	$(\pi \times R^2)/144$ (where π = 3.14 and R = radius of duct in inches)	Width x Height/144 (in inches)
Area in Sq. M	$(\pi \times R^2)/10{,}000$ (where π = 3.14 and R = radius of duct in centimeters)	Width x Height/10,000 (in centimeters)

Setting Flow Coefficient

1. Set FLOW COEFF to the appropriate value found in the following table. This value is a starting point for the air balancer.
2. To fine tune the flow coefficient use the following formula:

   ⇨ **New Flow Coefficient = (Actual Volume ÷ Controller Volume) × Old Flow Coefficient**
   The actual volume is the actual value obtained from the balancer's measurements. The controller volume is the value obtained from AIR VOLUME.
3. If the controller volume is not within 5% of the actual volume, repeat the procedure until it is within 5%.

Box Manufacturer Flow Coefficients		
Manufacturer	**Sensor Type**	**Value**
Anemostat	2-pipe without orifice 2-pipe with orifice Spider without orifice Spider with orifice	0.79 0.59 0.73 0.39
Carnes	2-pipe Flow cross	0.66 0.59
Carrier		0.59
E.H. Price/Siemens Industry Terminal Boxes		0.78
Environmental Technologies		0.79
Krueger		0.68
Metal Aire		0.72
Nailor Industries		0.69
Titus		0.60
Trane		0.66

Setting Airflow Setpoints

NOTE:
Maximum flow(s) must be set ≥ minimum flow(s).

1. Set CLG FLOW MIN to the desired minimum cooling airflow setpoint.
2. Set CLG FLOW MAX to the desired maximum cooling airflow setpoint.
3. Set HTG FLOW MIN to the desired minimum heating airflow setpoint.
4. Set HTG FLOW MAX to the desired maximum heating airflow setpoint.
5. Set VENT DMD MIN to the desired minimum ventilation flow. (**Note:** This point can be re-set by PPCL to respond to indoor air quality demands.)
6. Set NGT FLOW MIN desired minimum (or zero) flow for night/unoccupied modes.

⚠ CAUTION

For applications without a series or parallel fan. As a safety feature, MODHTG FLOW ensures that adequate airflow is present before an electric heating element is energized. Since the application has a default of one heating valve (MODHTG COUNT = 1), MODHTG FLOW has the default of 20 pct (of HTG FLOW MAX). If flow safety is not required, set MODHTG FLOW = 0 to eliminate the dependency.

The default value is 20, which means that the airflow must be at least 20% of HTG FLOW MAX before heating outputs are enabled. (Note that if CTL FLOW MAX is overridden, MODHTG FLOW becomes the minimum required percentage of CTL FLOW MAX rather than the minimum required percentage of HTG FLOW MAX.) If hot water heat is used rather than electric heat, then, using WCIS you can set the value of MODHTG FLOW to a lower value to allow heating at lower airflows.
For installations that include radiant heating panels (either ceiling or wall mounted), MODHTG FLOW should b set to zero.

Setting MODHTG SAFE

For applications with a parallel fan, a safety feature for the heating stages is provided when the fan is configured to operate by cycling when required (FAN MODE = VARIED).

When FAN MODE = VARIED and FAN is OFF, set MODHTG SAFE = **YES** to disable both MODHTG1 COMD and MODHTG2 COMD. When MODHTG SAFE = NO, heating commands will be as described in the Application Note.

Enabling Wall Switch

If a wall switch is used for day/night (occupied/unoccupied) control, enable it by setting WALL SWITCH to **YES**.

Otherwise, leave WALL SWITCH at its default value of **NO**.

Autozero Module

For a controller without an Autozero Module, the damper is commanded closed to get a zero airflow reading during calibration.

Setting Room Temperature Offset (Optional)

When the room has stabilized, take a precision temperature reading over a period of time at the room temperature sensor, record any difference between this reading and the value of ROOM TEMP and set this difference value (to the nearest 0.25°F (0.14°C)) into TEMP OFFSET.

Example

If the actual room temperature is 72.0°F (22.2°C), and the value of ROOM TEMP is 73.0°F (23.8°C), then the value entered into TEMP OFFSET is –1.0. In this case, the value of ROOM TEMP would read the raw value 73.0°F (23.8°C), but the value of CTL TEMP would read 72.0°F (22.2°C).

CTL TEMP = ROOM TEMP + TEMP OFFSET

Setting Controller Address

1. In WCIS select **View > Edit/View Reports**.
2. Select a report from list and click **Apply**.
3. Set CTLR ADDRESS to the BACnet MS/TP MAC address. (0 through 127 = Master; 128 through 254 = Slave).

NOTE:
See the *WCIS Online Help* for instructions on auto-addressing on the network. Otherwise, set the controller address and MS/TP network baud rate prior to connecting the controller to the network. See Configuring BACnet Parameters [→ 18].

Configuring BACnet Parameters

Using WCIS, do the following:

1. From the **Device** menu, select **Device Properties** to configure BACnet parameters.
2. In the **Object** section, enter information for the following fields:
   - **Name** – unique to BACnet network, (12 alphanumeric character limit).

- **ID** – unique to BACnet network (valid values are 0 through 4,194,303).
- **Description** – description of controller (60 alphanumeric character limit).
- **Location** – physical location of controller (60 alphanumeric character limit).

3. In the **BACNet Communication Settings** section:
   - **Set the CIS/MMI Command Priority to the desired value.**
   - Set **Baud Rate** to the MS/TP network baud rate. Options are; 9600, 19200, 38400 or 76800 (default is19200).
4. In the **MSTP Slave** section:
   - Check the box for a slave device.
   - Set the **MAC Master Node** number.
5. In the **Device Settings** section (configuring the Room Unit port), do one of the following:
   – If using a sensing only Room Unit, the baud rate can be 1200 to 76800. For optimal use with WCIS use **38400**.
   – If using a communicating digital Room Unit, the baud rate must be set to **1200**.
6. Press the **Write** button. The controller accepts the configuration values and then resets.
   ⇨ When the BACnet MS/TP TEC is successfully installed, the RX and TX LEDs flash On/Off rapidly and continuously (indicating proper communication with other devices on the network).

Auto Discover and Auto Addressing

An improved commissioning workflow has been designed for all BACnet PTEC controllers (standard 66xx applications) along with WCIS (Revision 4.0 and later). This provides the option to use the MS/TP network (using the field panel or a router) and the WCIS tool to discover and auto-address each controller. For more information, see the *WCIS Online Help*.

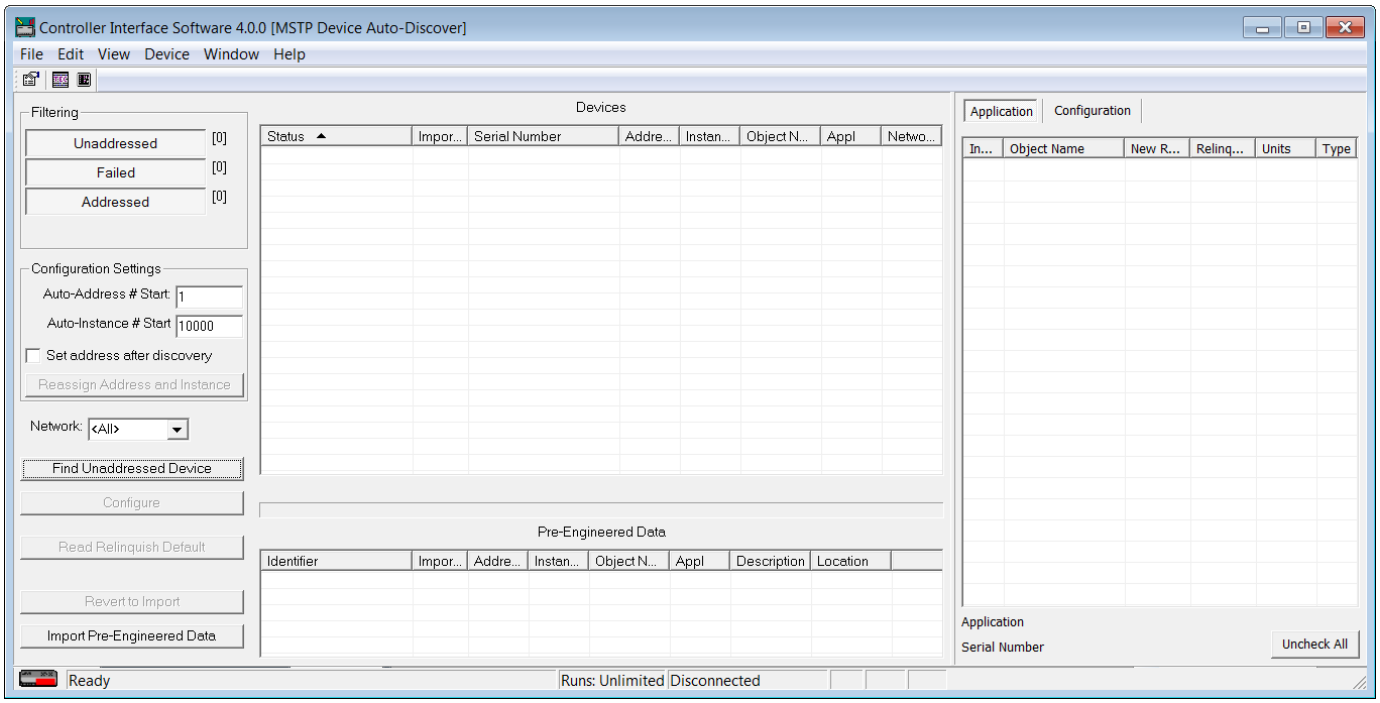
NOTE:
The current workflow will continue to support setting the baud rate and address for each controller using the HMI port or at the room unit.

▷ All BACnet PTEC controllers (standard 66xx applications) will have an internal unique serial number and a two part serial number label.

1. Connect WCIS to the field panel or use a router connected to MS/TP network.
2. Assign one PTEC a valid address (using the serial number). This will establish and set the baud rate for the entire network.

Auto Discovery allows you to automatically discover and identify PTEC controller devices on the BACnet MS/TP Network. There are two basic configurations:

- Devices not configured with an address. (Devices are discovered by their unique serial number.)
- Devices configured with an address and available for modification.



Filtering

These buttons allow you to select what you see in the Auto-discovery window. All three buttons are selected by default.

- **Unaddressed** - Displays unaddressed devices
- **Failed** - Displays failed devices
- **Addressed** - Displays addressed devices

Configuration Settings

- **Auto Address # Start** - Beginning address number. An address is reserved for each discovered device starting with this number.
- **Auto Instance # Start** - Beginning instance number. An instance number is reserved for each discovered device starting with this number.
- **Reassign Address and Instance** (pull-down menu) - Reassigns the address and instance number of the selected device(s).
- **Reassign Address Only** (pull-down menu) - Reassigns the address of the selected device(s).
- **Reassign Instance Only** (pull-down menu) - Reassigns the instance of the selected device(s).

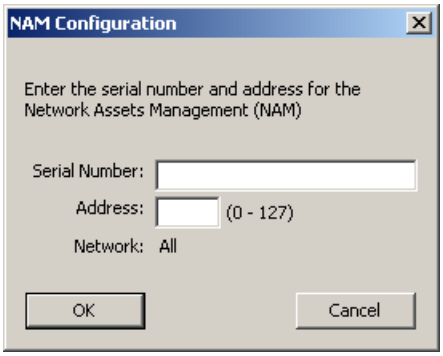
Auto-Discovery

- **Network** (pull-down menu) - Allows you to enter or select a specific network, if multiple networks are available.
- **Find Unaddressed Device** - Searches the connected network for all devices (addressed and unaddressed).
- **Configure** - Sends modified application data to the controller(s).
- **Relinquish Default** - Refreshes relinquish default column of the Application tab with values from the controller.
- **Revert to Import** - Returns to Pre-Engineered Data after changes have been made.
- **Import Pre-Engineered Data** - A .csv file can be used to set initial values in the controller. The file can be taken from Commissioning Tool or exported from Excel. See Commissioning a Controller [→ 23].

Auto-Discovery Procedure

- Click **Find Unaddressed Device**.

  ⇨ If a NAM device is not defined, the **NAM Configuration** window displays. (NAM - Network Asset Manager; All new TECs can be assigned as a NAM.)

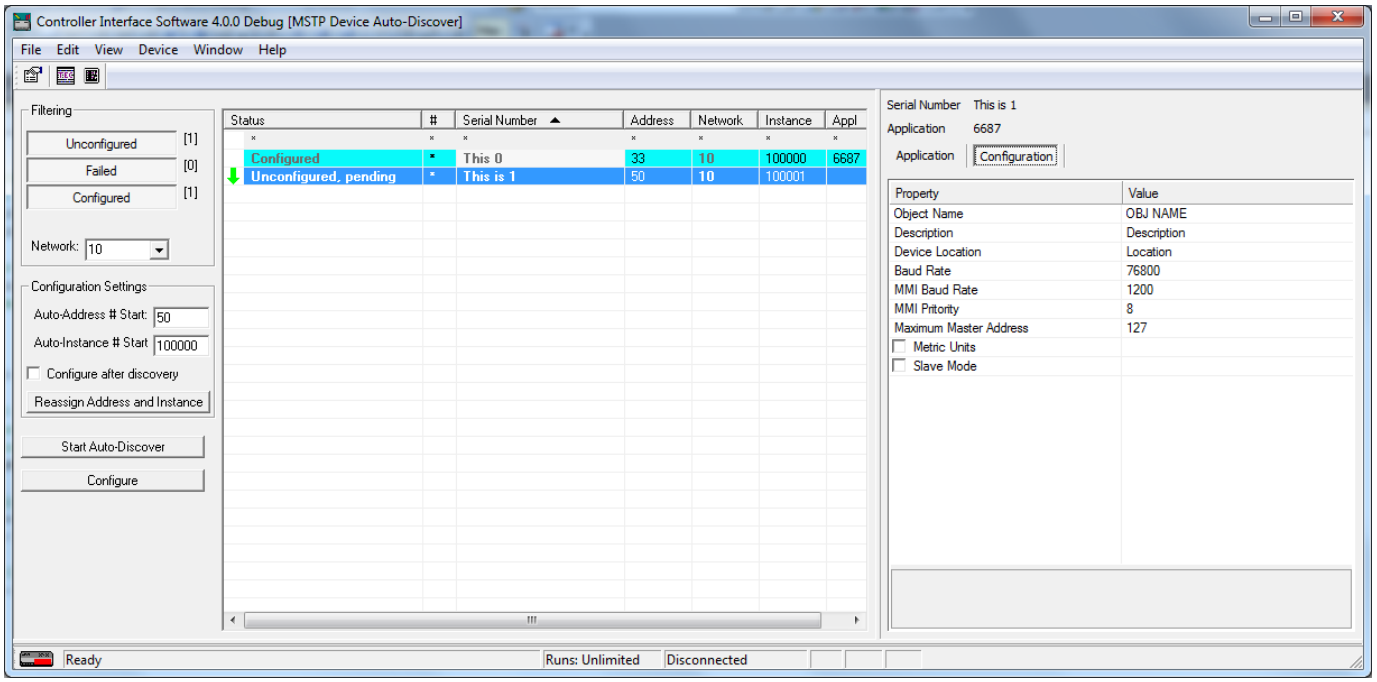
  

  - Enter the serial number (found on print from electrician).
  - Enter a unique (unused) address (0 - 127).
  - Click **OK**.

⇨ The device will be assigned as the NAM for the network with the address you specified.

⇨ The NAM device will auto-discover all other devices on the network.

⇨ WCIS will display all devices.

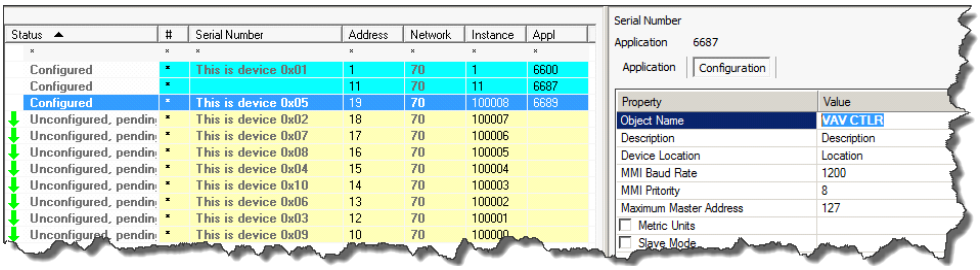


Configuring discovered devices

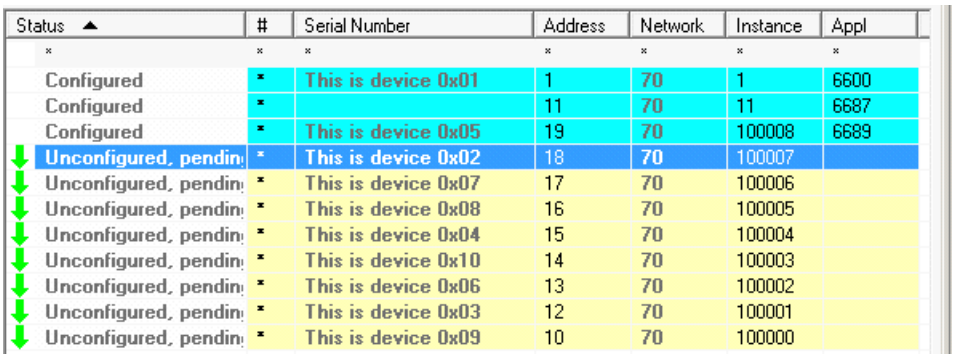
Each device on the network must have unique identifiers in the following fields:

- Address
- Instance
- Object Name - 30 alphanumeric character limit for Siemens field panels.

1. To change any of these fields, click in that field and enter the desired value.



2. When all fields are defined, click **Configure**.



⇨ All devices defined properly will display `Addressed`.

⇨ If a device has not been defined properly, it will display `Unaddressed` and the problem field displays red text.

Status	#	Serial Number ▲	Address	Network	Instance	Appl
*	*	*	*	*	*	*
Configured	*	This 0	33	10	4194303	6607
Configured, failed	*	This is 1	33	10	100000	6687

3. Correct any issues and click **Configure**.

Commissioning a Controller

Learning the Application Point Team

Once a device has been addressed, select your application.

- Do one of the following:
  - Right-click in the **Application** column and select the desired Application from the menu.
  - Click **Configure** to load the device for your application.
  - Right-click on the controller and select **Learn Point Team Descriptor**.

Import Data

1. Click the **Import Data** button.
   ⇨ The **Import Configuration Data** dialog box displays.
2. Browse to the desired .csv file and click **Open**.

⇨ The imported files are listed in the **Pre-Engineered Data** section of the Auto-Discovery window.

Each line in the window is a grouping of data for a controller.

Assigning Import Data to controller.

1. Click in the **Import ID** column of the desired controller in the devices section.
2. Select the appropriate **Import ID number** of the Pre-Engineered Data you want to assign.

⇨ The Application and Configuration tabs will update with the new (Pre-Engineered) data. You can manually change/update any data.

Assigning Import Data to Multiple Controllers

1. Click on the desired **Import Data** from the list in the Pre-Engineered Data section.
2. Select all desired controllers in the Devices window.
3. Right-click the selection in the Devices window and then select **Assign Import Data from Import ID x** in the pop-menu.
4. Click **Configure**.

⇨ The Application will load into each controller selected. The Application and Configuration tabs will update with the new (Pre-Engineered) data.

Commissioning Multiple Controllers

If you're commissioning multiple controllers with the same application all values can be loaded to each controller selected.

You can multi-select by holding either the SHIFT or CTRL key and clicking on multiple controllers listed.

You can configure values for multiple controllers with different applications by first selecting and making changes to one controller and then selecting all controllers and clicking Configure.

NOTE:
Once you select multiple controllers with different applications the Application tab goes blank. However, WCIS retains all changes and send the data for all selected controllers.

Flashing Controller Firmware

FLT Procedure

Use the Firmware Loading Tool (FLT) for this procedure.

1. Connect to RTS port of PTEC.
2. Set Communications to **1200 baud** and **ID**.
3. Click the **Identify** button in FLT.
4. Browse for new firmware.
5. Select **Load**.

WCIS Procedure

1. Connect to device.
2. From the **Device** menu, select, **Load TEC Firmware**.
   ⇨ The **Load TEC Firmware** dialog box displays.
3. Click the **Browse** button.
4. Select the firmware.
5. Select **Load**.

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