

# SIEMENS



## BACnet PTEC Controller Heat Pump Multi-Stage

### Start-up Procedures



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## Before You Begin



### NOTE:

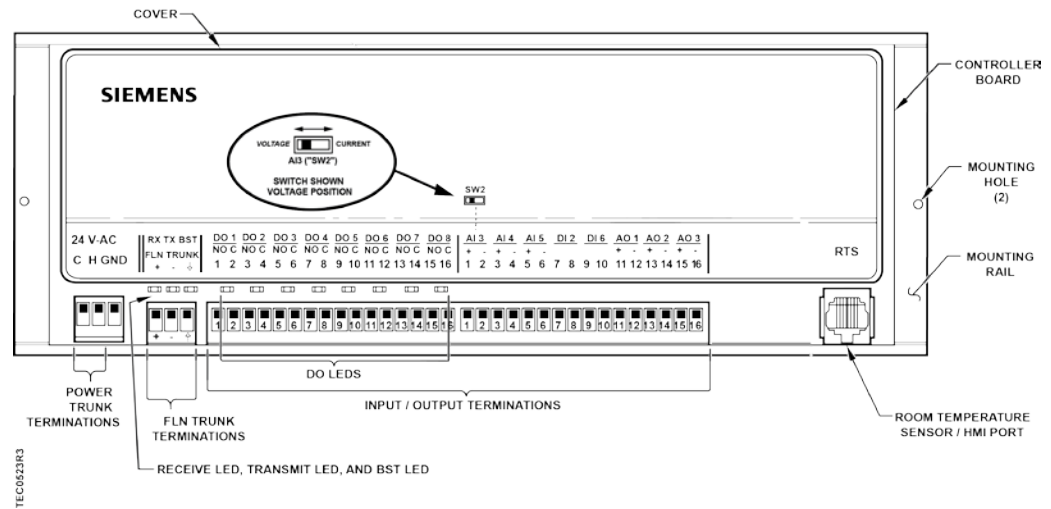
For information on applications with Firmware Revision Bx40 or earlier, see InfoLink and/or Asset Portal for documentation.



### 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 Heat Pump - Multi-Stage 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 point that determines actuator run times is:

- MTR TIMING
1. Use and/or 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. The name of these points vary.

Damper Actuator Run Time		
Damper Actuator	Setting (seconds)	
	50 Hz	60 Hz
GDE131.1	125	90
GLB131.1	150	125
PTS4 electronic-to-pneumatic transducer from ACT	-	90

## Specifying Motor Setup

MTR SETUP determines which actuators are controlled by the application and whether they are direct or reverse acting. Set MTR SETUP according to the table *MTR SETUP Values*.



### NOTE:

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

Motor 1 Not Used	Motor 1 Enabled	Motor 1 Enabled and Reversed
0	1	3

## For Spring-Return Damper (0 to 10V)

1. Set DAMPER TYPE to SPRING.
2. Do one of the following:
  - If the damper should open as the voltage increases (normally closed), leave AO DIR.REV at its default value of 0.
  - If the spring-return damper should close as the voltage increases (normally open), set AO DIR.REV to 1.

## Setting the Application

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

Application Description	Application Number
Multiple Compressor Heat Pump with Reversing Valve and Mixed Air Control	6673
Multiple Heating and Cooling Heat Pump with Mixed Air Control and Internal Reversing Valve	6674
Slave Mode	6690

The controller will go through a shut-down/load sequence as it switches from slave mode to the selected application.

## Setting DO DIR.REV

### Application 6673:

If the normal (de-energized) state of the reversing valve is cooling, leave DO DIR.REV at its default value of 0.

If the normal (de-energized) state of the reversing valve is heating, set DO DIR.REV to 4.



**NOTE:**

When REV VALVE is changed from normally cooling to normally heating by setting DO DIR.REV to 4, its value will change to reflect the appropriate state of the reversing valve, HEAT/COOL.



**CAUTION**

If any changes are made to DO DIR.REV, cycle power/reset the controller.

## Setting Number of Compressors

### Application 6673:

If using one compressor, leave CMP TOTL at its default value of 1. Otherwise, set CMP TOTL to the number of compressors used. Valid entries are 0, 1, 2, or 3.

### Application 6674:

If using one heating compressor, leave HTG CMP TOTL at its default value of 1. Otherwise, set HTG CMP TOTL to the number of compressors used for heating. Valid entries are 0, 1, or 2.

If using one cooling compressor, leave CLG CMP TOTL at its default value of 1. Otherwise, set CLG CMP TOTL to the number of compressor used for cooling. Valid entries are 0, 1, or 2.

## Setting Compressor Minimum OFF and ON Times

If the default values are not appropriate, display the main application report and set the points for compressor minimum OFF and ON times according to the specifications for the equipment being used:

### Application 6673:

Compressor 1	CMP1 MINOFF	default = 3 min
	CMP1 MIN ON	default = 3 min
Compressor 2	CMP2 MINOFF	default = 3 min
	CMP2 MIN ON	default = 3 min
Compressor 3	CMP3 MINOFF	default = 3 min
	CMP3 MIN ON	default = 3 min

**Application 6674:**

Cooling Compressor 1	CLG1 MIN OFF	default = 3 min
	CLG1 MIN ON	default = 3 min
Cooling Compressor 2	CLG2 MINOFF	default = 3 min
	CLG2 MIN ON	default = 3 min
Heating Compressor 1	HTG1 MIN OFF	default = 3 min
	HTG1 MIN ON	default = 3 min
Heating Compressor 2	HTG2 MIN OFF	default = 3 min
	HTG2 MIN ON	default = 3 min

**Setting Stages of Electric Heat and Cooling****Electric Heat:**

Check the hardware to verify the number of electric heat stages wired to the controller and set EHTG STG CNT to this value. (If not using electric heat, set EHTG STG CNT to 0.)

**CAUTION**

For installations using electric heat coils, never set min airflow settings to 0. Equipment damage can occur if electric heat is on without airflow.

**Cooling (Application 6674):**

If using one cooling compressor, leave CLG CMP TOTL at its default value of 1. Otherwise, set CLG CMP TOTL to the number of compressors used for cooling. Valid entries are 0, 1, or 2.

**Free Cooling:**

If free cooling is not used, leave FREE CLG at its default value of DISABL.

If free cooling is desired, add the appropriate PPCL statements in this controller or at the field panel to command FREE CLG to **ENABLE** on when free cooling is available and **DISABLE** when it is not available. See Setting Suggested Point Value to set start and end points (FREE CLG ON, FREE CLG OFF) for free cooling to function with the cooling compressors.

**Enabling Night Mixed Air Control**

If mixed air control is desired during night mode, (for example, free cooling when FREE CLG is enabled), enable it by setting NGT MA CTL to **YES**.



## 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 [→ 9])
- 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 [→ 12])



### 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  $\text{RM STPT DIAL} + 0.5 * \text{setpoint deadband}$
- In the heating mode, CTL STPT will be  $\text{RM STPT DIAL} - 0.5 * \text{setpoint deadband}$

**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 74 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 <sub>2</sub> sensing
8	If short board: 100K $\Omega$ thermistor on AI 3 (else input is 10K $\Omega$ ) If long board: 100K $\Omega$ thermistor on AI 5 (else input is 10K $\Omega$ )
16	Long board only: 100K $\Omega$ thermistor on AI 4 (else input is 10K $\Omega$ )

### 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).

### Room ENTHALPY

When the SENSOR SEL enables the relative humidity sensor, the controller will calculate the ENTHALPY value for information or for use by PPCL in the controller or

field panel to determine when FREE CLG should be enabled. Calculations will be based on valid values of the control temperature (CTL TEMP) and room humidity (RM RH).

## 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 Fan to Cycle with Compressor

If the fan is to cycle during day mode with the compressor(s), set CYCLE FAN to **YES**. Otherwise, the fan will be on all the time in day mode. In either case, the fan will cycle in night mode.

## 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**.

## Setting Room Temperature Offset (optional)

Enter plus or minus corrections for room temperature sensor in RMTMP OFFSET.

### Example

If the actual room temperature is 72.0°F (22.2°C), but the value of ROOM TEMP is showing 73.0°F (23.8°C), then the value to be entered into RMTMP OFFSET (or TEMP OFFSET) would be -1.0 (negative 1 degree). In this case, ROOM TEMP would read the raw value 73.0°F (23.8°C), but CTL TEMP would equal 72.0°F (22.2°C).

**CTL TEMP = ROOM TEMP + RMTMP OFFSET (or TEMP OFFSET)**

## Setting Suggested Point Values

The following table lists suggested point values for various heat pump configurations. Set these values as appropriate for your configuration.

Application 6673: Suggested Point Values for Heat Pump Configurations with 1 Compressor					
Point Number	Descriptor	1 Compressor 0 Elec Heat Stages	1 Compressor 1 Elec Heat Stages	1 Compressor 2 Elec Heat Stages	1 Compressor 3 Elec Heat Stages
61	FREE CLG ON	40%	40%	40%	35%
62	FREE CLG OFF	20%	20%	20%	15%
76	EHTG STG CNT	0	1	2	3
81	EHEAT 1 ON	–	80%	80%	70%
82	CMP1 ON	60%	60%	60%	55%

Application 6673: Suggested Point Values for Heat Pump Configurations with 1 Compressor					
Point Number	Descriptor	1 Compressor 0 Elec Heat Stages	1 Compressor 1 Elec Heat Stages	1 Compressor 2 Elec Heat Stages	1 Compressor 3 Elec Heat Stages
83	CMP1 OFF	40%	40%	40%	35%
84	RVAL SWITCH	30%	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%	5%
94	EHEAT 2 ON	–	–	98%	85%
95	EHEAT 3 ON	–	–	–	98%

Application 6673: Suggested Point Values for Heat Pump Configurations with 2 or 3 Compressors					
Point Number	Descriptor	2 Compressors 0 Elec Heat Stages	2 Compressors 2 Elec Heat Stages	3 Compressors 0 Elec Heat Stages	3 Compressors 1 Elec Heat Stage
16	CMP2 ON	70%	70%	70%	55%
17	CMP2 OFF	50%	50%	50%	40%
34	CMP3 ON	–	–	90%	70%
35	CMP3 OFF	–	–	70%	55%
61	FREE CLG ON	30%	30%	30%	25%
62	FREE CLG OFF	10%	10%	10%	10%
75	CMP TOTL	2	2	3	3
76	EHTG STG CNT	0	2	0	1
81	EHEAT 1 ON	–	85%	–	85%
82	CMP1 ON	50%	50%	50%	40%
83	CMP1 OFF	30%	30%	30%	25%
84	RVAL SWITCH	30%	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%	5%
94	EHEAT 2 ON	70%	98%	–	–

Application 6674: Suggested Point Values for Heat Pump Configurations with 0 or 1 Compressor				
Point Number	Descriptor	0 Heating Compressors 1 Cooling Compressor 1 Elec Heat Stage	0 Heating Compressors 2 Cooling Compressors 1 Elec Heat Stage	1 Heating Compressor 1 Cooling Compressor 0 Elec Heat Stages
30	CLG CMP1 ON	60%	50%	60%
31	CLG CMP1	40%	30%	40%

Application 6674: Suggested Point Values for Heat Pump Configurations with 0 or 1 Compressor				
Point Number	Descriptor	0 Heating Compressors 1 Cooling Compressor 1 Elec Heat Stage	0 Heating Compressors 2 Cooling Compressors 1 Elec Heat Stage	1 Heating Compressor 1 Cooling Compressor 0 Elec Heat Stages
	OFF			
34	CLG CMP2 ON	–	70%	–
35	CLG CMP2 OFF	–	50%	–
61	FREE CLG ON	40%	30%	40%
62	FREE CLG OFF	20%	10%	20%
75	HTG CMP TOTL	0	0	1
76	EHTG STG CNT	1	1	0
77	CLG CMP TOTL	1	2	1
81	ELEC HEAT ON	60%	60%	–
82	HTG CMP1 ON	40%	40%	60%
83	HTG CMP1 OFF	20%	20%	40%
85	SWITCH LIMIT	5%	5%	5%

Application 6674: Suggested Point Values for Heat Pump Configurations with 1 Heating and 1 or 2 Cooling Compressors				
Point Number	Descriptor	1 Heating Compressor 1 Cooling Compressor 1 Elec Heat Stage	1 Heating Compressor 2 Cooling Compressors 1 Elec Heat Stage	1 Heating Compressor 2 Cooling Compressors 0 Elec Heat Stages
30	CLG CMP1 ON	60%	50%	50%
31	CLG CMP1 OFF	40%	30%	30%
34	CLG CMP2 ON	–	70%	70%
35	CLG CMP2 OFF	–	50%	50%
61	FREE CLG ON	40%	30%	30%
62	FREE CLG OFF	20%	10%	10%
81	ELEC HEAT ON	80%	80%	–
82	HTG CMP1 ON	60%	60%	60%



Application 6674: Suggested Point Values for Heat Pump Configurations with 1 Heating and 1 or 2 Cooling Compressors				
Point Number	Descriptor	1 Heating Compressor 1 Cooling Compressor 1 Elec Heat Stage	1 Heating Compressor 2 Cooling Compressors 1 Elec Heat Stage	1 Heating Compressor 2 Cooling Compressors 0 Elec Heat Stages
83	HTG CMP1 OFF	40%	40%	40%
85	SWITCH LIMIT	5%	5%	5%

Application 6674: Suggested Point Values for Heat Pump Configurations with 2 Heating and 1 or 2 Cooling Compressors				
Point Number	Descriptor	2 Heating Compressors 1 Cooling Compressor 0 Elec Heat Stages	2 Heating Compressors 1 Cooling Compressor 1 Elec Heat Stage	2 Heating Compressors 2 Cooling Compressors 0 Elec Heat Stages
16	HTG CMP2 ON	70%	70%	70%
17	HTG CMP2 OFF	50%	50%	50%
30	CLG CMP1 ON	60%	60%	50%
31	CLG CMP1 OFF	40%	40%	30%
34	CLG CMP2 ON	–	–	70%
35	CLG CMP2 OFF	–	–	50%
61	FREE CLG ON	40%	40%	30%
62	FREE CLG OFF	20%	20%	10%
81	ELEC HEAT ON	–	90%	–
82	HTG CMP1 ON	50%	50%	50%
83	HTG CMP1 OFF	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%

## HP DO OVRD

This application includes a setup point that enables or disables ON and OFF commands to critical DOs. Specifically, the fan and compressor(s) (and reversing valve in Application 6673) cannot be directly commanded ON or OFF unless the point HP DO OVRD is set to ENABLE. When HP DO OVRD is set to DISABL, commands to these critical DO points are ignored regardless of BACnet command priority. Commands to electric heat DOs and any spare DOs are always allowed. Physical

points DO1 and DO2 can never be overridden when configured for motor control. However, the position of the attached motor is always commandable via DMPR CMD.



**CAUTION**

**HP DO OVRD should be set to ENABLE only when there is a complete understanding of the consequences.**

Since the direct control will override the applications minimum on and off time safeties, improper use of the DO commands can cause permanent equipment damage. Also, during normal daily operation, the override of critical DOs should only be done via a BACnet command. If a digital output is overridden via the MMI port, the point may be left in an incorrect internal state upon release. If during commissioning an override command must be issued via the MMI port, it is critical that the point be manually commanded off before the point is released.

- Set HP DO OVRD = DISABL to prevent all external commands from overriding the fan, compressor(s), or reversing valve DOs regardless of BACnet priority level. (This is the default mode).
- Set HP DO OVRD = ENABLE (READ THE CAUTION ABOVE! EQUIPMENT DAMAGE CAN OR WILL RESULT IF HP DO OVRD IS SET TO ENABLE INAPPROPRIATELY) to allow external commands *and PPCL (Added by JC, true statement?)* at any BACnet priority level to override the fan, compressor(s), or reversing valve DOs.

## 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 is 19200).
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*.

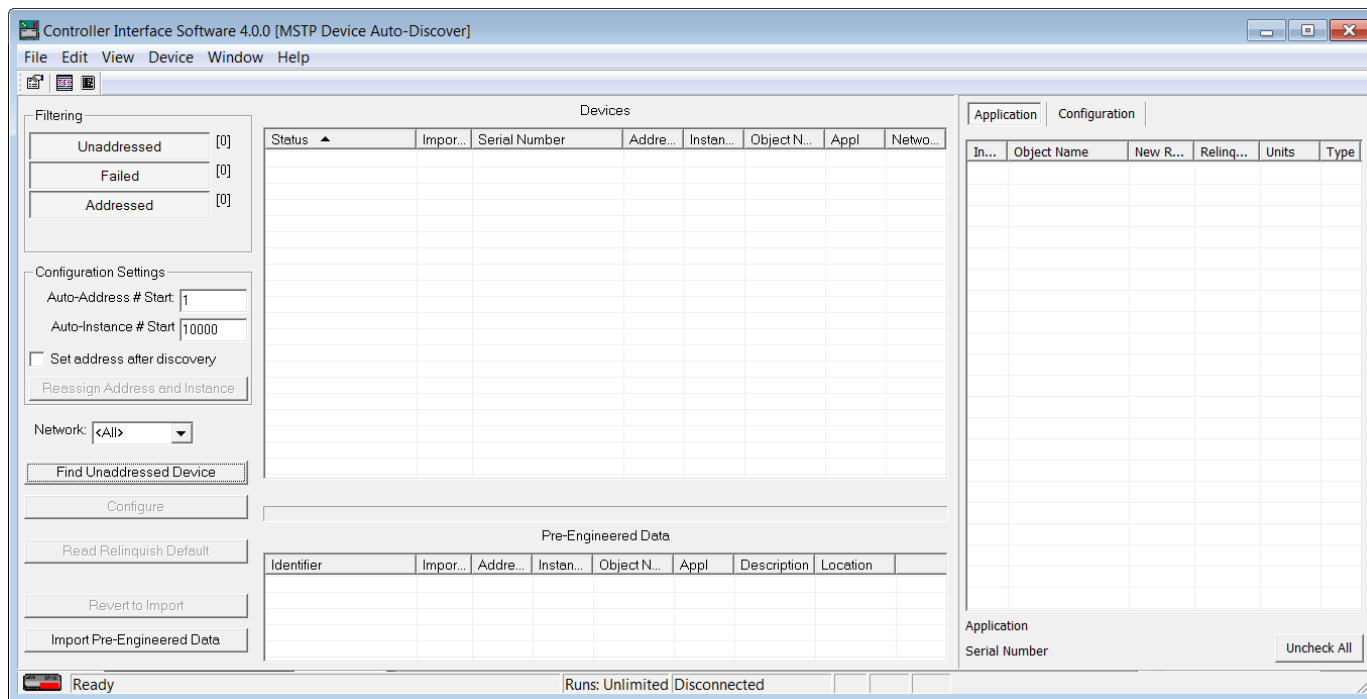
**NOTE:**

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).

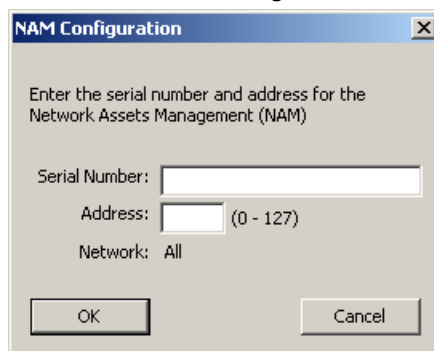
## Auto-Discovery

- **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.)

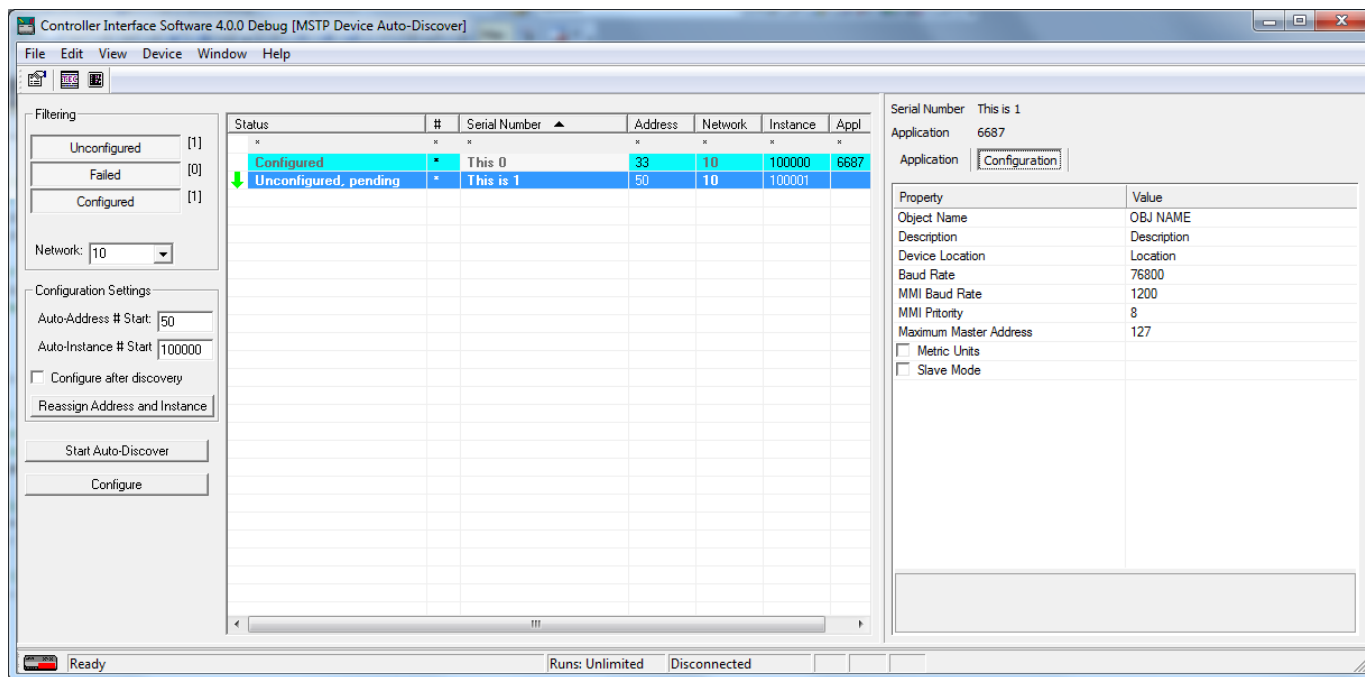
The image shows a 'NAM Configuration' dialog box. It has a title bar with the text 'NAM Configuration' and a close button. The main area contains the text 'Enter the serial number and address for the Network Assets Management (NAM)'. Below this, there are three input fields: 'Serial Number:' followed by a text box, 'Address:' followed by a text box with '(0 - 127)' to its right, and 'Network:' followed by a dropdown menu currently set to 'All'. At the bottom, there are two buttons: 'OK' and 'Cancel'.

- 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.

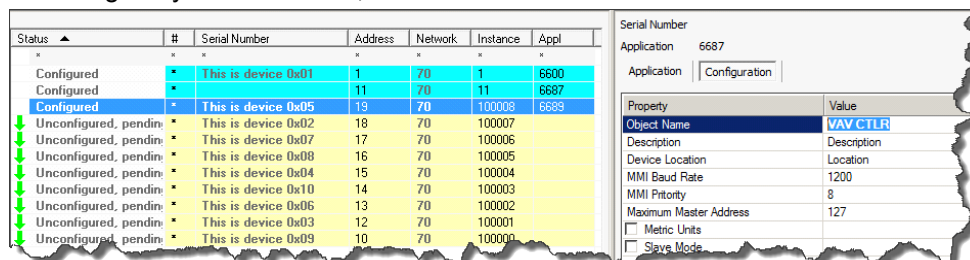


## Configuring discovered devices

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**.

Status	#	Serial Number	Address	Network	Instance	Appl
Configured	*	This is device 0x01	1	70	1	6600
Configured	*	This is device 0x02	11	70	11	6687
Configured	*	This is device 0x05	19	70	100008	6689
Unconfigured, pending	*	This is device 0x02	18	70	100007	
Unconfigured, pending	*	This is device 0x07	17	70	100006	
Unconfigured, pending	*	This is device 0x08	16	70	100005	
Unconfigured, pending	*	This is device 0x04	15	70	100004	
Unconfigured, pending	*	This is device 0x10	14	70	100003	
Unconfigured, pending	*	This is device 0x06	13	70	100002	
Unconfigured, pending	*	This is device 0x03	12	70	100001	
Unconfigured, pending	*	This is device 0x09	10	70	100000	

⇒ 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.



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### 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.

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## 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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