

# SIEMENS



## BACnet PTEC Controller

## Unit Conditioner - Electronic Output

## Start-up Procedures



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## Before You Begin



**NOTE:**

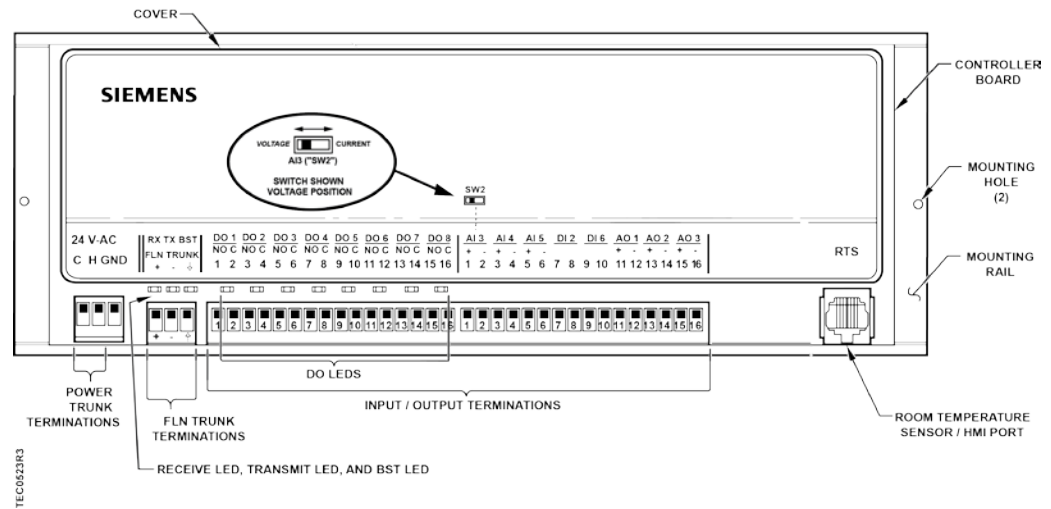
For information on applications with Firmware Revision Bx40 or earlier, see InfoLink and/or Asset Portal for documentation.

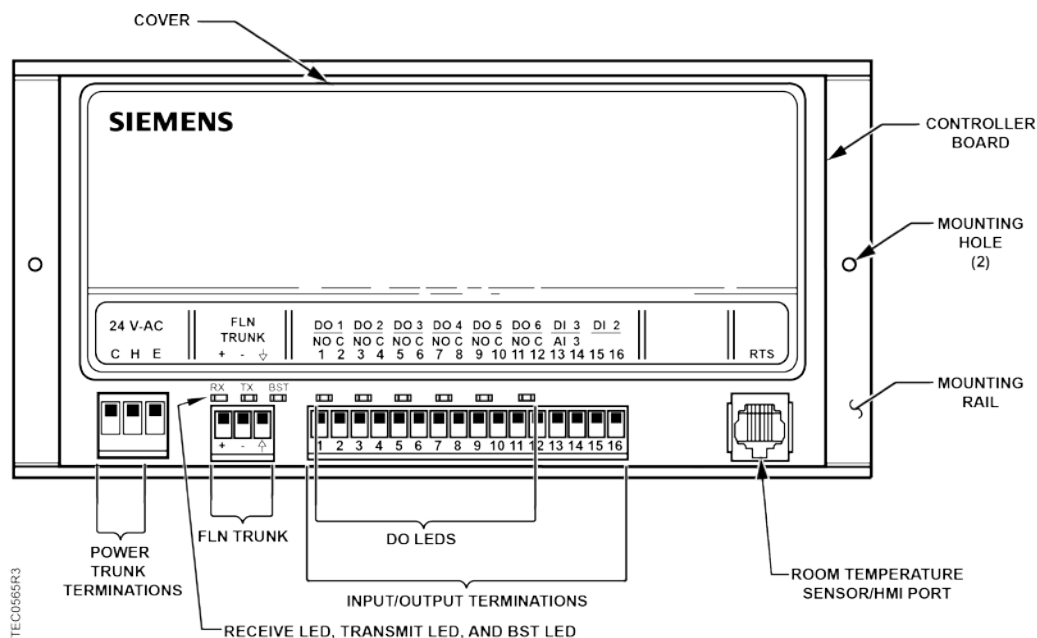


**NOTE:**

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:**

Applications 6642 to 6648 on long board.  
Applications 6640/6641 and 6650 to 6654 on short board.

## Communication and DO Indicators

The Siemens BACnet PTEC Unit Conditioner 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.

## Verifying Power to the Controller

Verify that the controller is powered up. Check that the BST LED on the controller is flashing. If the BST LED does not flash on/off once per second, see the *iKnow Troubleshooting Tool* or contact Technical Support for troubleshooting information.

## 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:

- MTR 1 TIMING
- MTR 2 TIMING
- MTR 3 TIMING

Your application may not have or use all three points.

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 DMPx ROT ANG to the appropriate value. The names of these points vary.

## Specifying Motor Setup

MTR SETUP determines which actuators are controlled by the application and whether they are direct or reverse acting. See the *MTR SETUP Values for Standard Configurations* table for standard configurations and the *Motor Enable/Reverse Values for MTR SETUP* table for non-standard configurations.



### NOTE:

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

MTR SETUP Values for Standard Configurations.					
Application (short board)	Application (long board)	Configurations			Value for MTR SETUP
		Motor 1	Motor 2	Motor 3	
6640	6642	damper (normally closed)	spare	spare	1
6641	6643	damper (normally closed)	heating valve 1 (normally open)	heating valve 2 (normally open) (optional)	for one valve: 13 for two valves: 61
6650	6644	heating/cooling valve 1	heating valve 2 (normally	N/A	for one valve: 3 for two

MTR SETUP Values for Standard Configurations.					
Application (short board)	Application (long board)	Configurations			Value for MTR SETUP
		Motor 1	Motor 2	Motor 3	
		(normally open)	open (optional)		valves: 15
6651	6645	cooling valve 1 (normally closed)	heating valve 2 (normally open)	N/A	13
6652	6646	N/A	N/A	N/A	0
6653	6647	N/A	heating valve (normally open)	N/A	12
6654	6648	cooling valve (normally closed)	N/A	N/A	1

Motor Enable/Reverse Values for MTR SETUP									
	Motor 1 Enabled			Motor 1 Enabled and Reversed			Motor 1 Not Used		
	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed
Motor 3 Not Used	1	5	13	3	7	15	0	4	12
Motor 3 Enabled	17	21	29	19	23	31	16	20	28

## 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 Unit Conditioner Controller Installation Instructions (550-108, 550-145), 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 (short board)	Application Number (long board)
VAV Pressure Dependent Cooling or Heating (Unit Conditioner application)	6640	6642
VAV Pressure Dependent with Hot Water Heat (Unit Conditioner application)	6641	6643
Two Pipe Fan Coil Unit Cooling or Heating and Hot Water Coil	6650	6644
Fan Coil Unit Cooling and Heating	6651	6645
Fan Coil Unit 2—Stage Cooling and Electric Heat	6652	6646
Fan Coil Unit 2—Stage Cooling and Hot Water Heat	6653	6647
Fan Coil Unit Cooling and Electric Heat or VAV Pressure Dependent with Electric Heat	6654	6648
Slave Mode	6689	6691

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

## Setting Cooling Stages

Application 6652-short board, Application 6646-long board and Application 6653- short board, Application 6647-long board only: Check the hardware to verify the number of number of cooling stages (1 or 2) used and set CLG STG CNT to this value.

## Setting Number of Heat Stages or Valves

Depending on the application, HTG STG CNT or VLV CNT (if present) refers to electric heat stages or valves used (enabled).

- For water or steam valve applications, set VLV CNT to the number of valves used (1 or 2).
- For electric heat applications, check the hardware to verify the number of electric heat stages wired to the controller (1 to 3) and set HTG STG CNT to this value.



### CAUTION

**Insufficient airflow across energized electric heating coils can cause equipment damage.**

Minimum flow must provide adequate airflow across energized electric heating coils.



## Setting Calibration Interval

Set CAL TIMER to the time interval that will trigger calibration of the damper and/or valve(s). The default is 12 hours.

## 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).

## 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 $\Omega$ )

SENSOR SEL Value * (additive)	Description (include values to enable feature)
16	Long board only: 100K $\Omega$ thermistor on AI 4 (else input is 10K $\Omega$ )

## 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.

## 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 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 [→ 10].

## 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*.



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### NOTE:

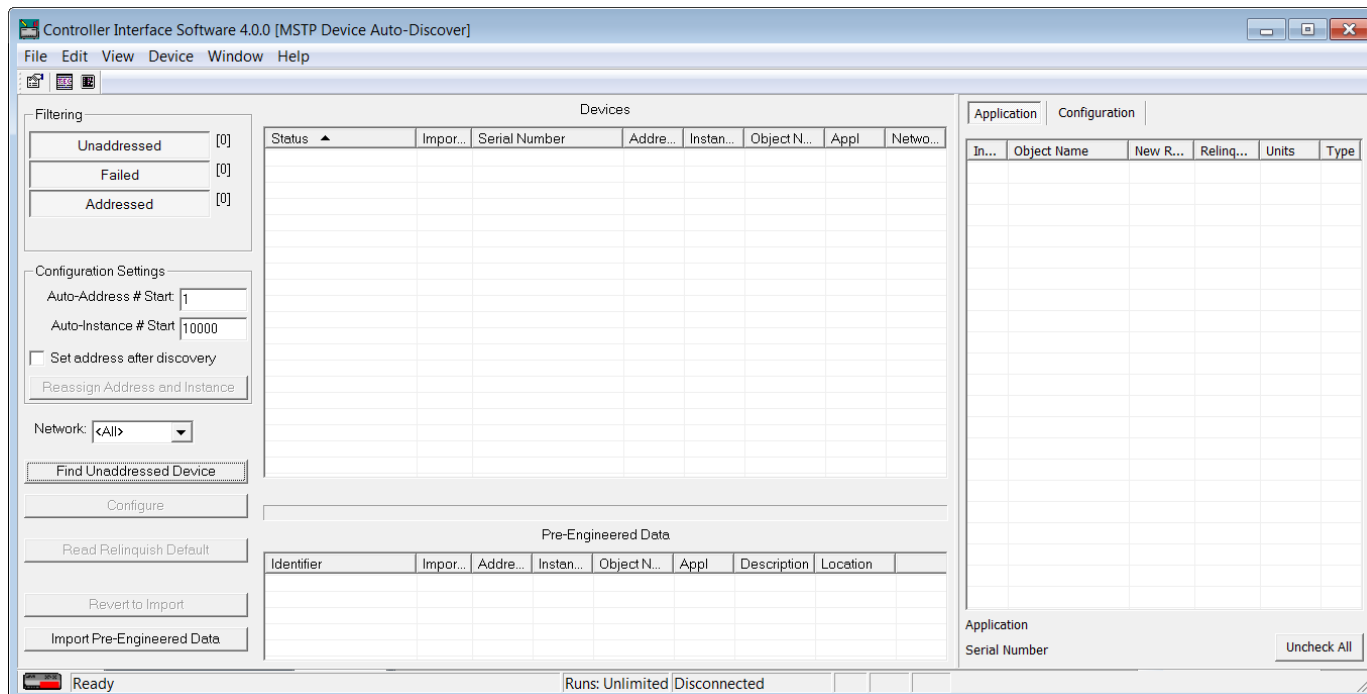
The current workflow will continue to support setting the baud rate and address for each controller using the HMI port or at the room unit.

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- ▷ 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

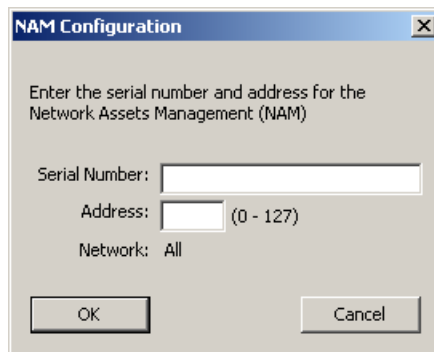
- **Network** (pull-down menu) - Allows you to enter or select a specific network, if multiple networks are available.
- **Find Unaddressed Device** - Searches the connected network for all devices (addressed and unaddressed).
- **Configure** - Sends modified application data to the controller(s).

- **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 [→ 15].

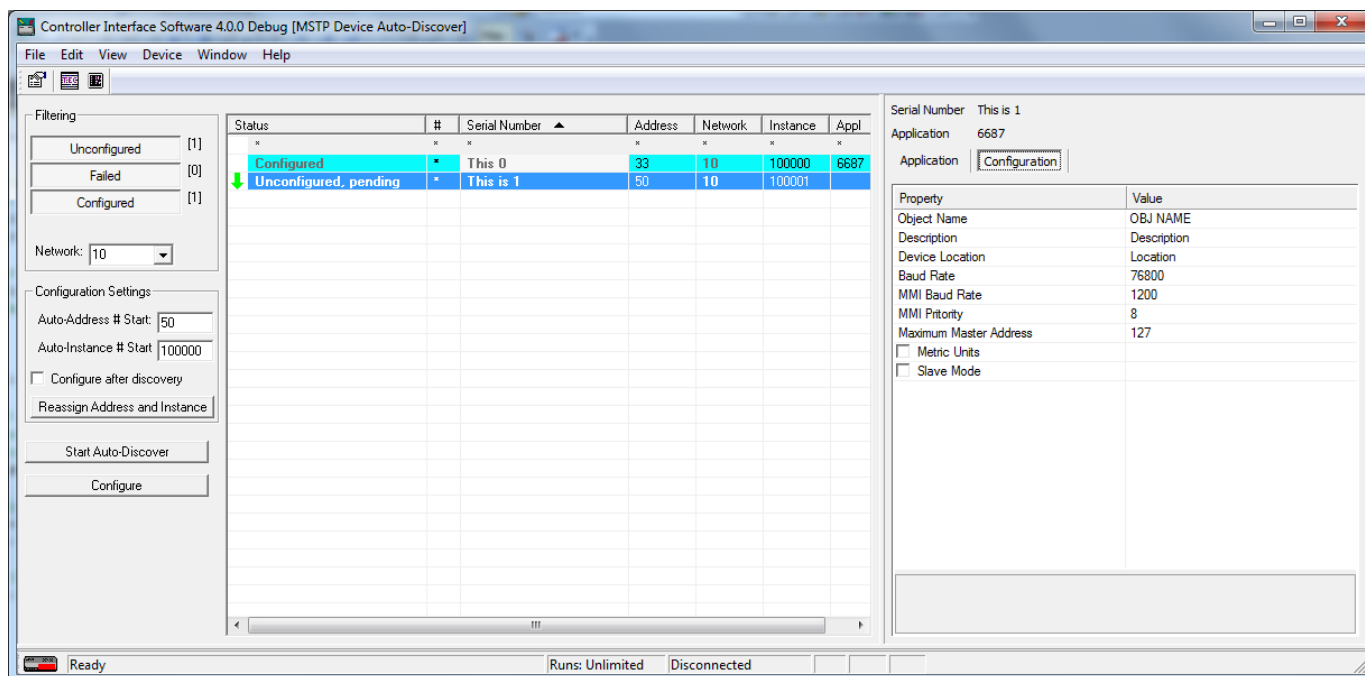
## Auto-Discovery Procedure

- 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.)



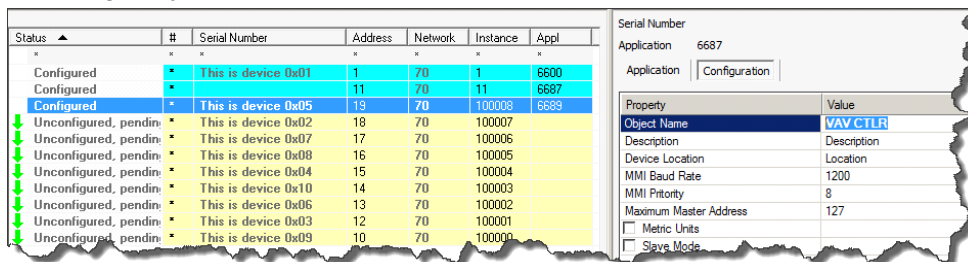
- Enter the serial number (found on print from electrician).
  - Enter a unique (unused) address (0 - 127).
  - Click **OK**.
- ⇒ The device will be assigned as the NAM for the network with the address you specified.
- ⇒ The NAM device will auto-discover all other devices on the network.
- ⇒ WCIS will 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**.

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 0x07	18	70	100007	
Unconfigured, pending	*	This is device 0x08	17	70	100006	
Unconfigured, pending	*	This is device 0x04	16	70	100005	
Unconfigured, pending	*	This is device 0x10	15	70	100004	
Unconfigured, pending	*	This is device 0x06	14	70	100003	
Unconfigured, pending	*	This is device 0x03	13	70	100002	
Unconfigured, pending	*	This is device 0x09	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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