

# SIEMENS



## BACnet PTEC Controller

## Extended I/O

## Start-up Procedures



# Table of Contents

**Before You Begin.....4**

Room Unit Identification.....5

Setting the Application .....5

Setting Room Temperature Offset (optional).....5

Using Room Unit Setpoint .....6

Setting SENSOR SEL.....6

Specifying Motor Setup.....7

    Verifying Actuator Setup.....7

Setting Controller Address.....7

Configuring BACnet Parameters .....8

Auto Discover and Auto Addressing.....9

    Commissioning a Controller .....12

Flashing Controller Firmware.....14

## Before You Begin



### NOTE:

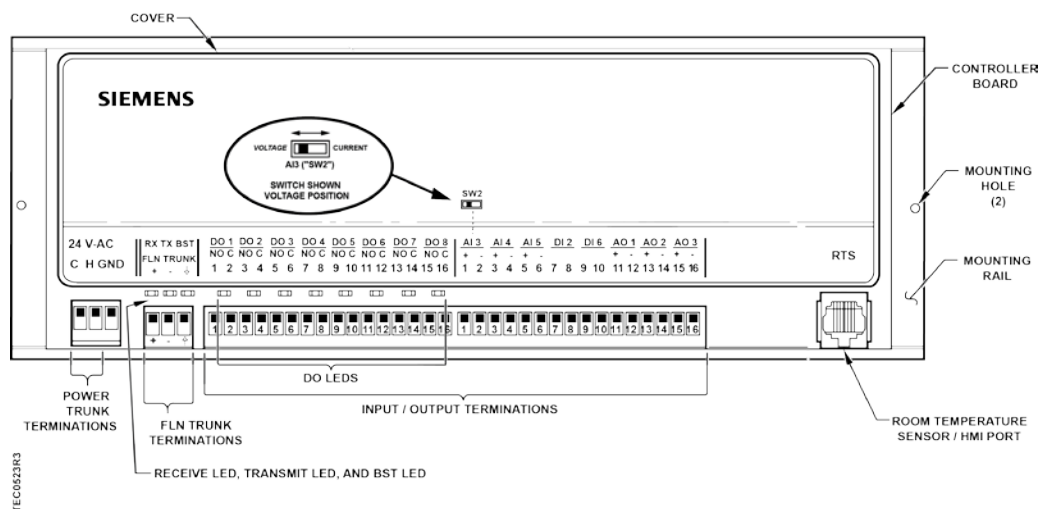
For information on applications with Firmware Revision Bx40 or earlier, see InfoLink and/or Asset Portal for documentation.



### 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 Extended I/O 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.

At the job site, locate the major control system and the mechanical and electrical drawings. These components include valves, motors, and any other components working in conjunction with the TEC.

1. Verify that the TEC input/output (I/O) points are wired per the installation instructions.
2. Verify that the Basic Sanity Test (BST) LED on the controller flashes once per second.

For more information, contact your nearest Siemens Industry, Inc. representative.



**NOTE:**

Update each controller at the field panel immediately after you have completed the controller start-up procedures and made all other changes to the controller's point database, including balancing, tuning, etc.

## 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.

## Setting the Application

Add the TEC to your job database with Application 6696.

Application 6696 is a point extension device and does not have any application control elements. If control actions are required, add PPCL to the controller or use applications in a field panel.

## 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)**

## Using Room Unit Setpoint

When an analog room unit with setpoint adjustment is connected to the controller, the setpoint displays in RM STPT DIAL.

If a digital room unit is configured for temperature and has the optional room setpoint feature, RM STPT DIAL will display the user selection. See *SENSOR SEL*.

Note that this point, RM STPT DIAL, is not part of any default control.

## 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 $\Omega$ )

## 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 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.

MTR SETUP Values									
	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
Motor 3 Enabled and Reversed	49	53	61	51	55	63	48	52	60

## 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 Extended I/O Controller Installation Instructions (550-140), the iKnow Troubleshooting Tool, or contact Field Support.

## 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 [→ 8].

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## 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*.



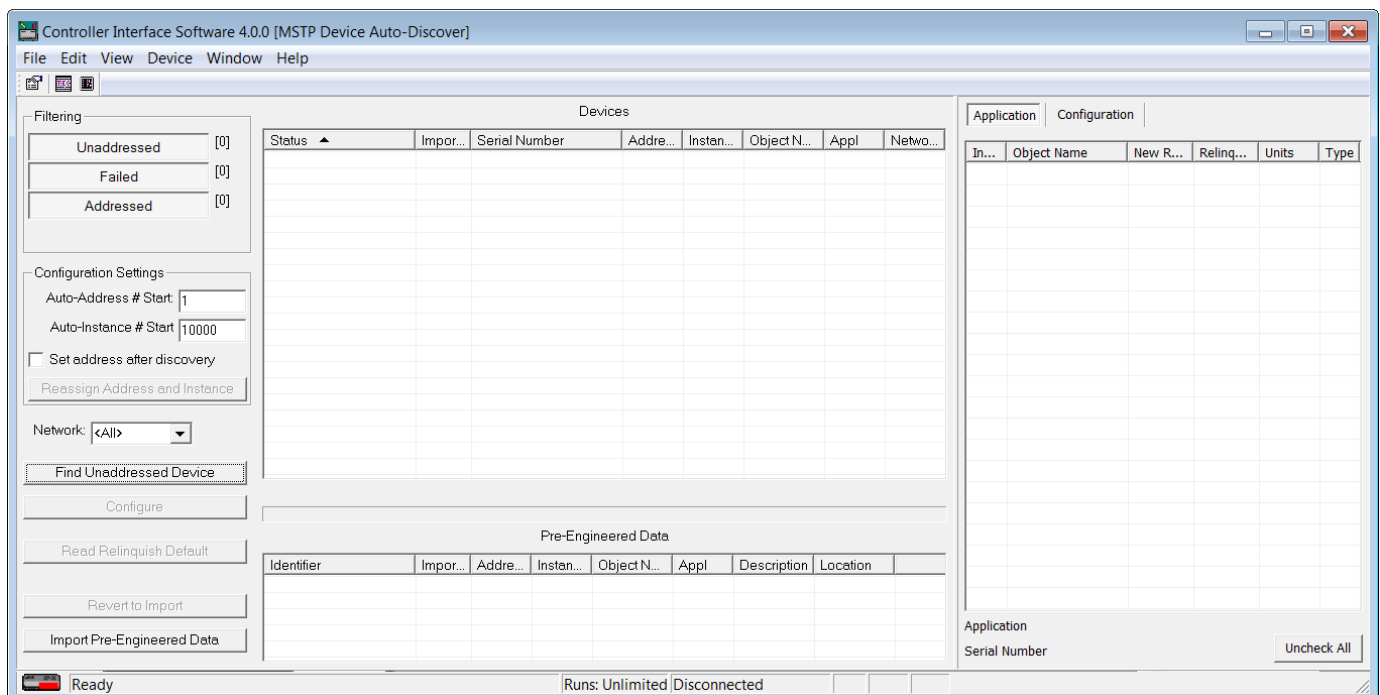
### NOTE:

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).

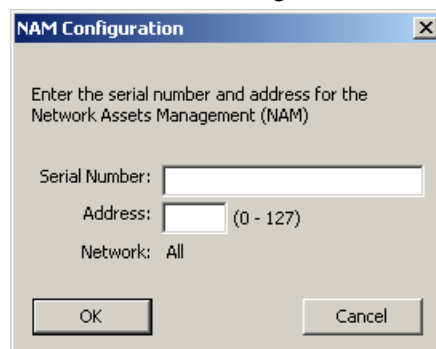
## Auto-Discovery

- **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 [→ 12].

## Auto-Discovery Procedure

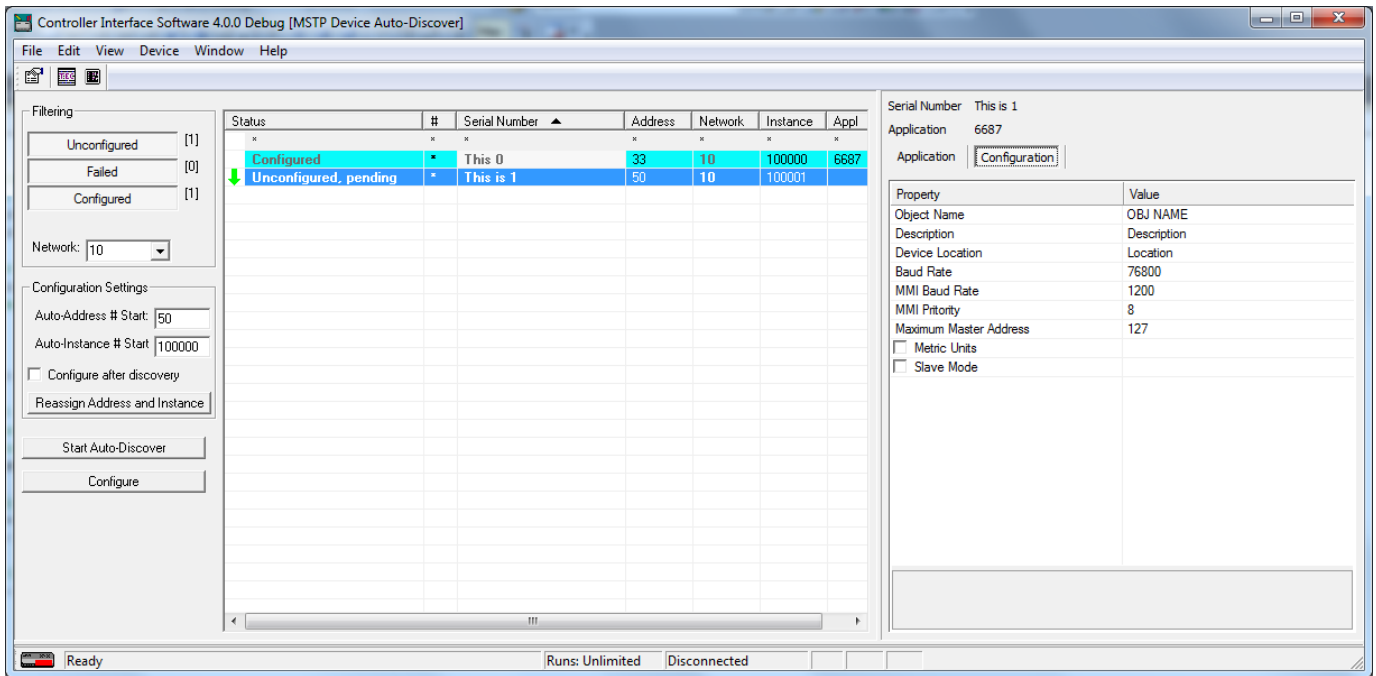
- Click **Find Unaddressed Device**.

⇒ 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 Windows-style dialog box titled "NAM Configuration". Inside the dialog, there is a text prompt: "Enter the serial number and address for the Network Assets Management (NAM)". Below this prompt are three input fields: "Serial Number:" followed by a text box, "Address:" followed by a text box and the text "(0 - 127)", and "Network:" followed by a dropdown menu currently showing "All". At the bottom of the dialog are two buttons: "OK" and "Cancel".

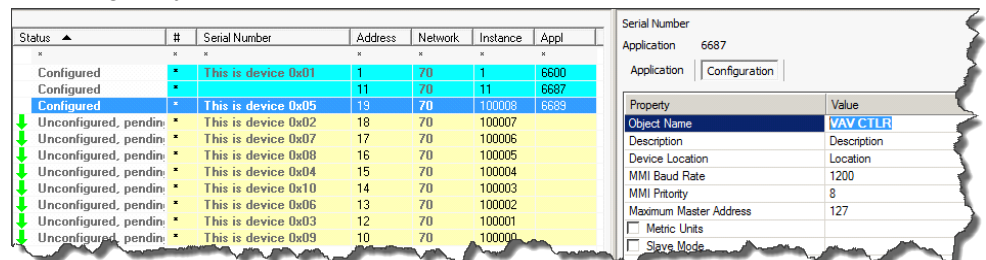
- Enter the serial number (found on print from electrician).
  - Enter a unique (unused) address (0 - 127).
  - Click **OK**.
- ⇒ The device will be assigned as the NAM for the network with the address you specified.
- ⇒ The NAM device will auto-discover all other devices on the network.
- ⇒ WCIS will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

- Click the **Import Data** button.
  - ⇒ The **Import Configuration Data** dialog box displays.
- 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.

- Click in the **Import ID** column of the desired controller in the devices section.
- 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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