Building Management System Integration Software for C·CURE 9000 v3.00 User Guide

Building Technologies and Solutions
www.jci.com
2023-10-04

A16381J8MP
Rev A
Software version 3.00

Johnson Controls

Contents

Integration software overview

This integration provides the integration between C•CURE 9000 and Building Management Devices based on BACnet protocol, allowing customers to configure and control BMS devices. It provides connectivity to equipment using the BACnet protocol over Ethernet (called BACnet/IP or Annex J). Devices on other BACnet network types may be accessed using BACnet gateway devices. If the device is based on other protocol(e.g. N2), a protocol converter to BACnet(e.g. BACnet - N2 router) is needed.

This integration also provides a gateway mechanism for wrapping objects in C•CURE 9000 to BACnet objects, so the third party system can monitor C•CURE 9000 object change through BACnet protocol if necessary.

BACnet, Building Automation and Control Networks, is a data communication protocol and an agreed-upon set of rules for creating interoperable networks of building systems. When using BMS integration, it is recommended that users be familiar with the standard BACnet objects and properties.

The BMS integration provides Device management, Alarm and Event management, and Action management features on C•CURE 9000, which works as Supervisory Controller and controls BACnet device directly. This integration also provide gateway function to map C•CURE 9000 objects to BACnet objects. It provides the default gateway templates and also provide the way to customize gateway template.

Features

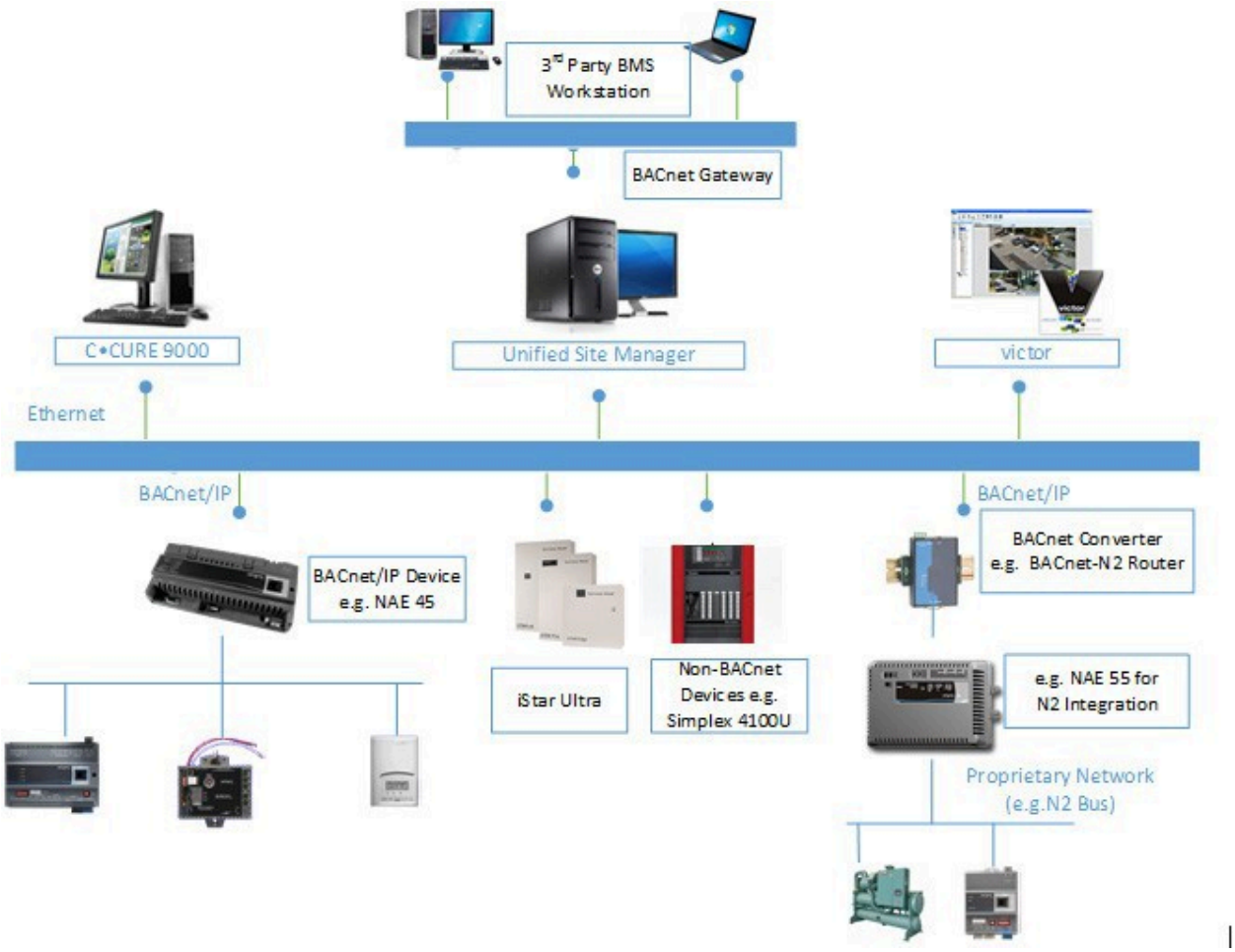
- Automatic Device Discovery
- Multi-condition triggers
- Interaction among devices (Non-BACnet and BACnet)
- View devices animation state on map
- All the changes of value are logged in the security journal for future investigative reporting
- Supports BACnet/IP(Annex J) protocol:
- Supports subscription to the change of value (COV) event notification for many properties
- Supports the following Objects, with most properties of the standard object types supported:
  - Analog Input
  - Analog Output
  - Analog Value
  - Binary Input
  - Binary Output
  - Binary Value
  - Multi-state Input
  - Multi-state Output
  - Multi-state Value
  - Schedule and Device.
- Supported Services: Who-Is, I-Am, ReadProperty, ReadPropertyMultiple, WriteProperty, WritePropertyMultiple, SubscribeCOV, SubscribeCOVProperty, ConfirmedCOVNotification, UnconfirmedCOVNotification.
- Acknowledge Event Notification in Alarm.
- BACnet gateway function - map C•CURE 9000 objects to BACnet objects.
- Default gateway templates: iStar people counting, Event gateway templates.
- Customized gateway template.

- View monitor objects summary.
- Supports BBMD: Manager BBMD: BACnet IP Communication across different networks.

Architecture

The Architecture diagram depicts the relationship between BACnet devices and BMS integration.

Figure 1: Architecture



Using the Building Automation Pane

BACnet integration objects are created in the Building Automation pane on your C•CURE 9000 Administration Client Application.

When you install the BMS integration product, the building Automation Pane appeared on the navigation tree.

BMS integration installation

Before installing the C•CURE 9000 BMS integration, you must first install C•CURE 9000 software on your target computer. For information on installing C•CURE 9000, refer to the C•CURE 9000 Installation and Upgrade Guide.

Similar to the C•CURE 9000 system, the BMS integration has Client and Server components. You must install the Client components on every computer that runs C•CURE 9000 client applications, and you must install the Server components on the C•CURE 9000 server computer. The BMS integration has the same hardware, software, and disk space requirements as C•CURE 9000; if the target computer can install C•CURE 9000, then it satisfies BMS integration requirements.

To install the BMS integration, you run the setup.exe from the BMS integration installation kit.

A wizard prompts you to install the C•CURE 9000 BMS integration. You need to perform the basic installation process described in the following pages on each computer in your C•CURE 9000 system. Be sure to close all C•CURE 9000 and virus-checking applications on client workstations before performing the installation.

The following table lists the steps to install and register the C•CURE 9000 BMS integration on each computer in your C•CURE 9000 system. Perform these steps in order.

Table 1: Standard Installation Tasks

Task
1. Install C•CURE 9000.
2. Close any open application and disable virus checking software.
3. Perform the pre-installation steps.
4. Start the BACnet driver installation program.
5. Verify the license for the BACnet driver by running the License program on your C•CURE 9000 server.
6. When the Installation and registration are complete, restart the services

Before you begin

You may need to perform some pre-installation steps before you install the C•CURE 9000 BMS integration.

Checking Networks Status

To install C•CURE 9000 on a corporate network, be sure to coordinate with your corporate network administrator. Check that the network is working properly. According to BACnet protocol, the BACnet converter should receive broadcast. The C•CURE 9000 also should receive broadcast.

The default C•CURE 9000 BACnet port is UDP 47808.

Checking System Privileges

To perform the installation, you must have appropriate Windows permissions. You must be in the local Administrators group, or have equivalent privileges. See the Microsoft Operating System documentation or your system administrator for more information.

If you do not have sufficient permissions, the following error message will appear as shown in the following image.

Figure 2: Error Message

Database Installation

If you are installing server components of the C•CURE 9000 BMS integration, the C•CURE 9000 BMS integration will add some tables to the C•CURE 9000 database. Currently, the C•CURE 9000 BMS integration does not support installation with C•CURE 9000 on an Oracle Database. Therefore, you must install on a C•Cure 9000 system that is using SQL Server. The C•Cure 9000 BMS integration install program automatically finds the C•CURE 9000 database and adds tables and initial data to it.

Getting the BMS integration

The BMS integration is located on the C•CURE 9000 2.4 DVD in the Integration\BMS folder, and can also be downloaded from the Software House website.

Download the BMS integration

Before you begin:
Please be advised to use C•CURE 9000 with the latest service Pack 1 for the BMS integration.

About this task:

1. Open a browser and navigate to www.swhouse.com.
2. Select **Products**, and then select **Software Downloads** in the list.
3. When the login page opens, log in. If you do not have an account, you must create one.
4. Click the **Software Downloads** link.
5. On the **Software Downloads** page, select the **Software House Connected** link.
6. Select **Building Automation** from list.
7. When the **BMS integration Downloads** list is displayed on the right hand of the page, select the BMS integration link for the version of C•CURE 9000 that you have installed.
8. Unzip the files to a folder on your local computer, or to a shared drive on the network.

Installing the BMS integration

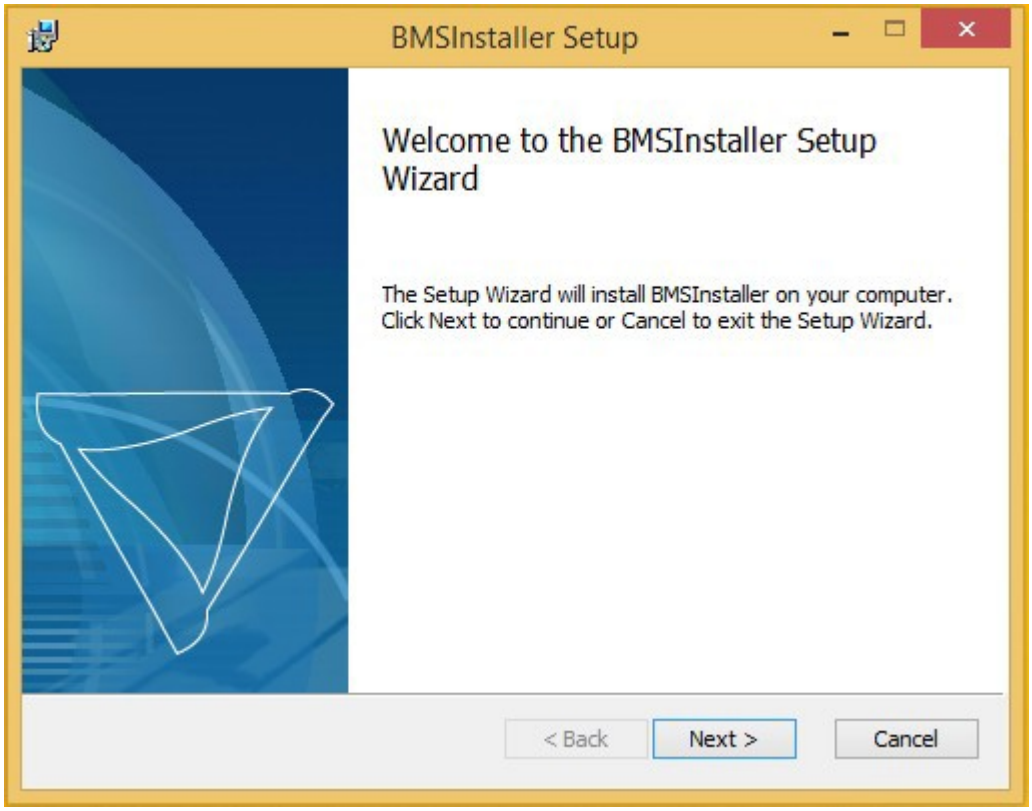
Before you begin:
You can install the software to a drive on a local computer or from a shared drive over the network.

ⓘ **Note:** Ensure that you meet all the requirements described in Pre-installation Requirements before completing these steps.

1. Log on to the server or client with Windows administration privileges.
2. Navigate to the folder that contains the BMS integration software.
3. Right-click setup.exe, and select **Run as administrator**.

4. On the welcome window, click **Next**.

Figure 3: Welcome window

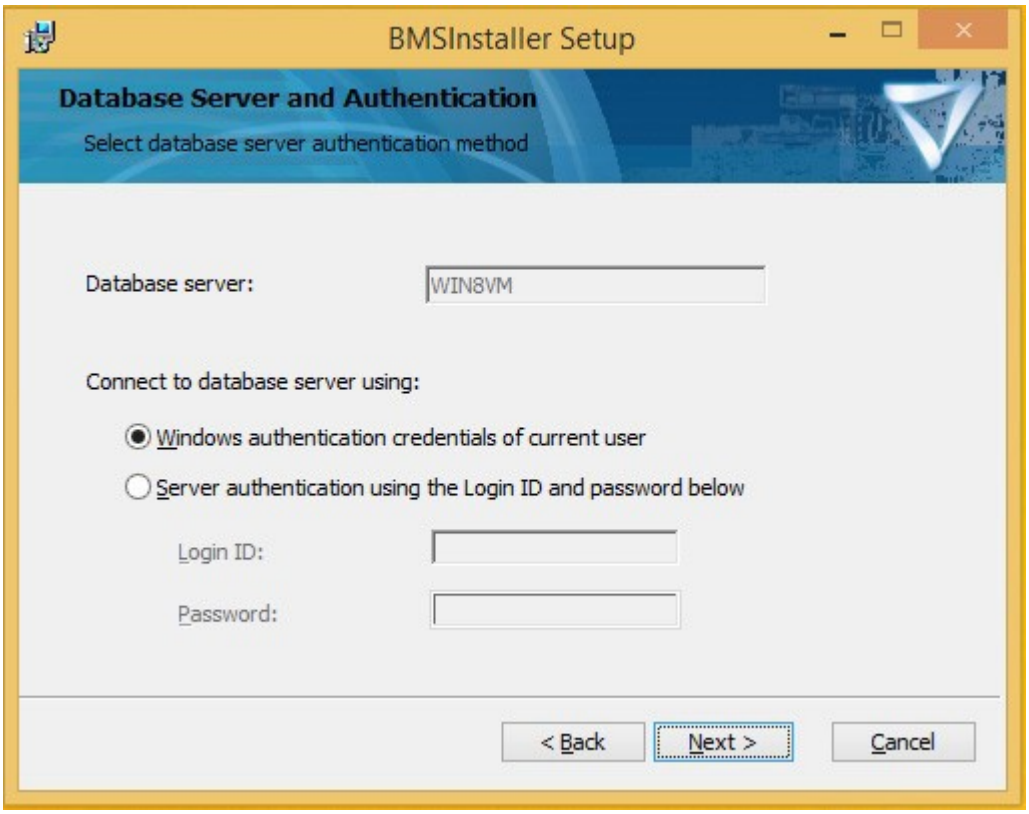


5. On the **License Agreement** page, select the **I accept the terms in the License Agreement** check box, and then click **Next**.

Figure 4: License Agreement

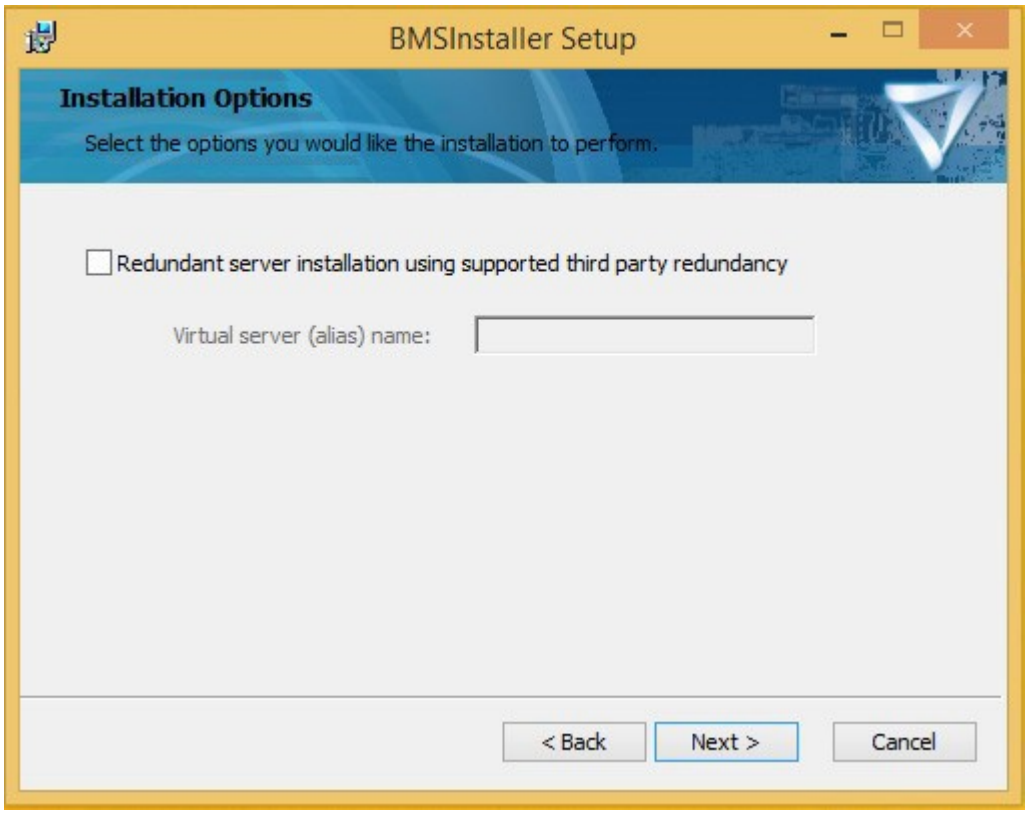
6. On the **Database Server and Authentication** page, click **Next**.

Figure 5: Database Server

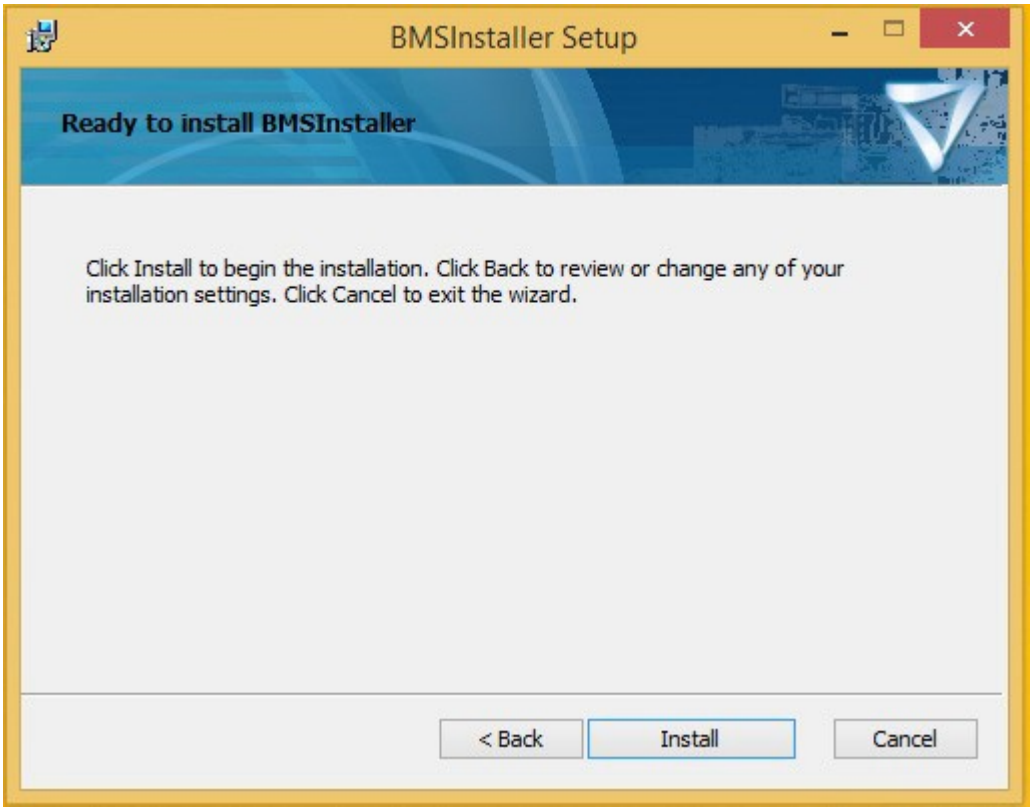


7. On the **Installation Options** page, click **Next**.

Figure 6: Installation Options

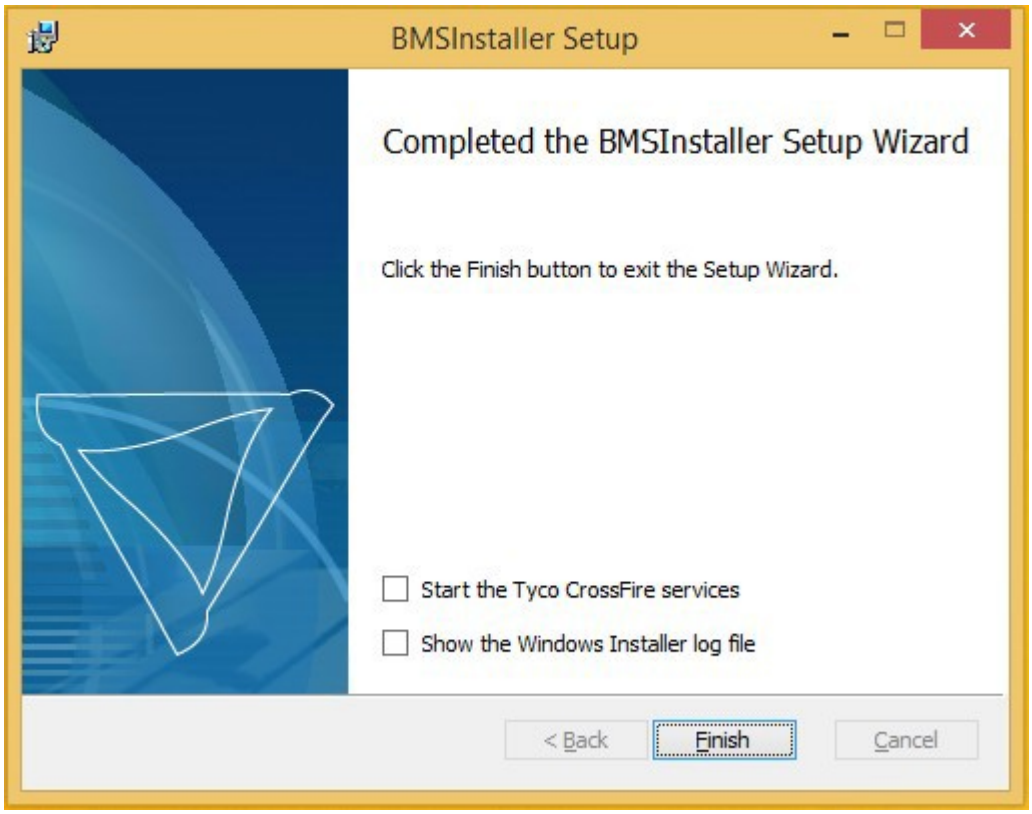


8. From the **Ready to Install BMSInstaller** page, click Install.



9. After the installation is complete, click **Finish**.

Figure 7: Installation Complete



Starting the BMS integration

Before you begin:
Before you can import BACnet devices, you must start the BMS integration using the C•CURE 9000 Server Management Application Server Components tab.

1. From the Start Menu, select **Start>All Programs>Software House>Server Configuration**. The C•CURE 9000 Server Management Application opens.
2. Click the **Services** tab.
3. Select the **Enabled** check box for the SoftwareHouse CrossFire BACnet Driver Service and then start the service.
4. When the Crossfire Framework Service, CrossFire Server Component Service, and the SoftwareHouse CrossFire BACnet Driver Service is Running you can configure BMS integration objects in the C•CURE 9000.

Uninstalling the BMS integration

About this task:
This section describes how to uninstall the C•CURE 9000 BMS integration from the Server computer and from each Client computer in your security system.

The Uninstall process removes all software components that were installed on the computer by the C•CURE 9000 BMS integration program.

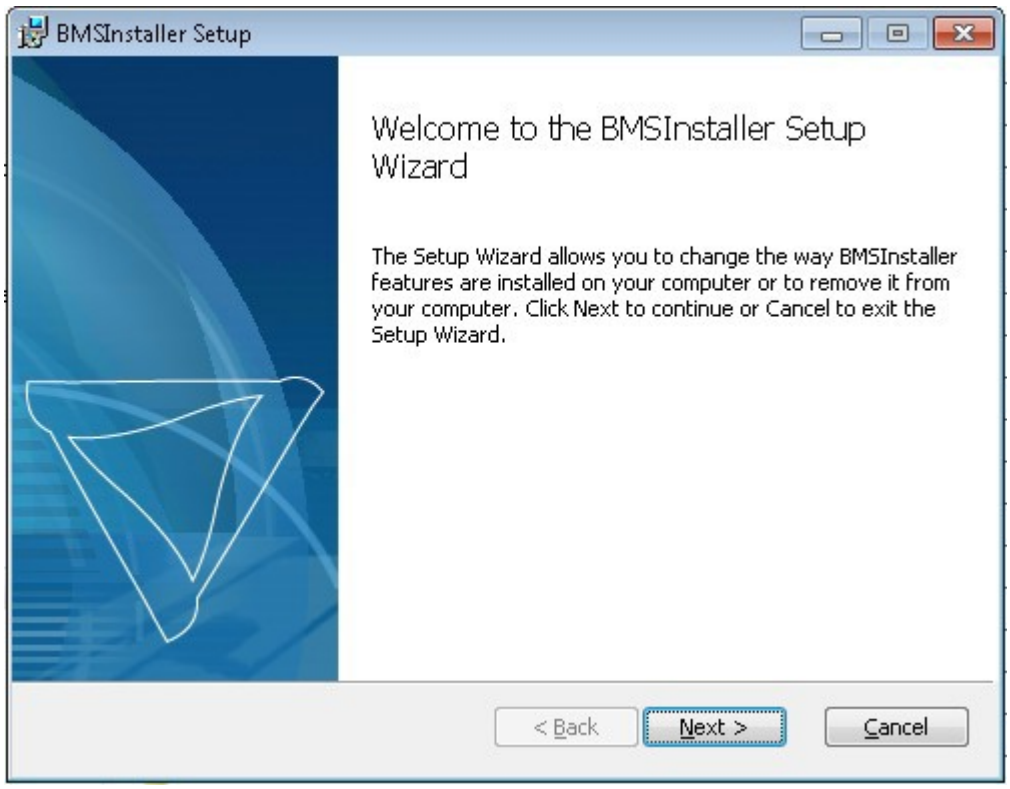
⚠ **CAUTION:** Please be advised that the BMS integration uninstall will shutdown and restart the C•CURE 9000 services. Therefore, the BMS integration uninstall should be planned accordingly.

Uninstalling this integration does not automatically remove objects that were configured in the C•CURE 9000 using it. Before you proceed with this uninstall, you MUST manually remove the objects from C•CURE 9000 to avoid potential issues with functions, such as partition deletion.

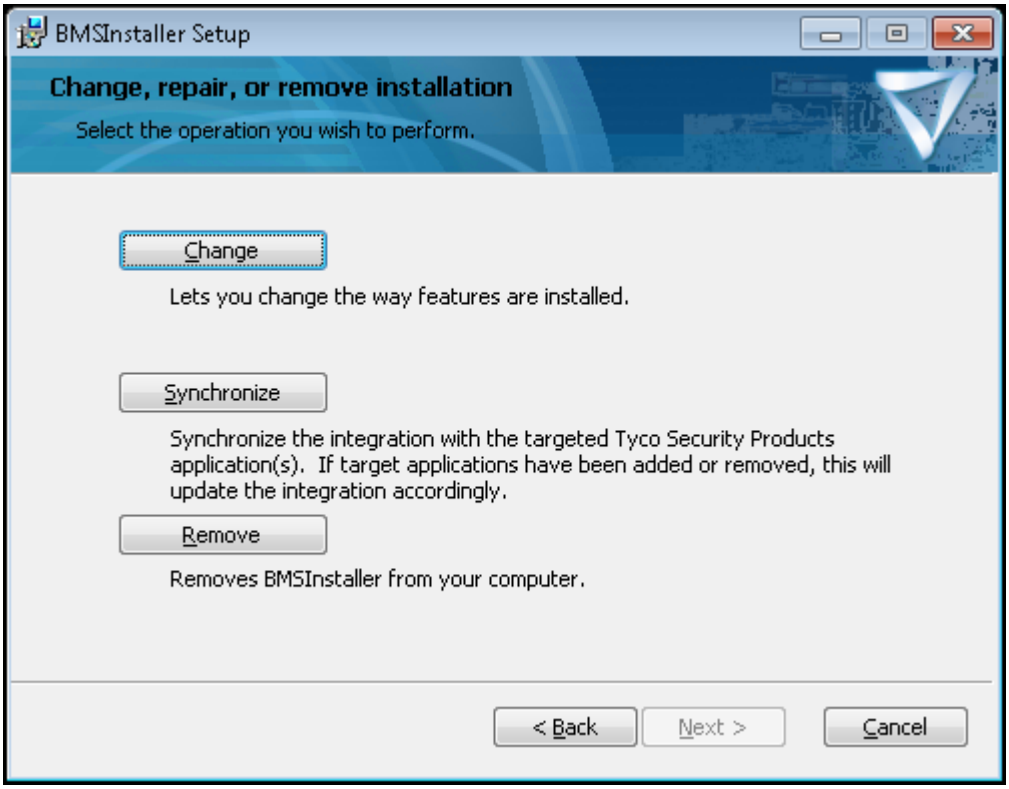
Unless you intend to reinstall the integration and continue using it, please ensure that the objects are deleted before removing the integration.

Once the uninstall process completes, the computer will be in a “clean” state.

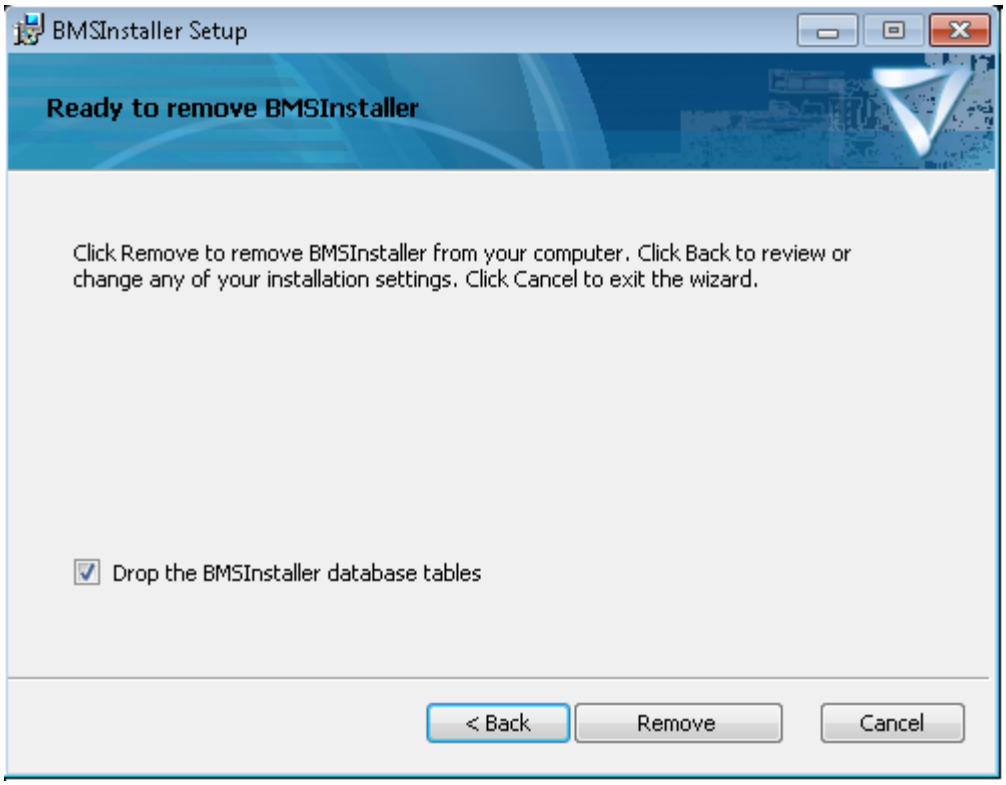
1. Navigate to the installation kit folder.
2. Right-click setup.exe, and select **Run as administrator**, the following welcome dialog box displays.



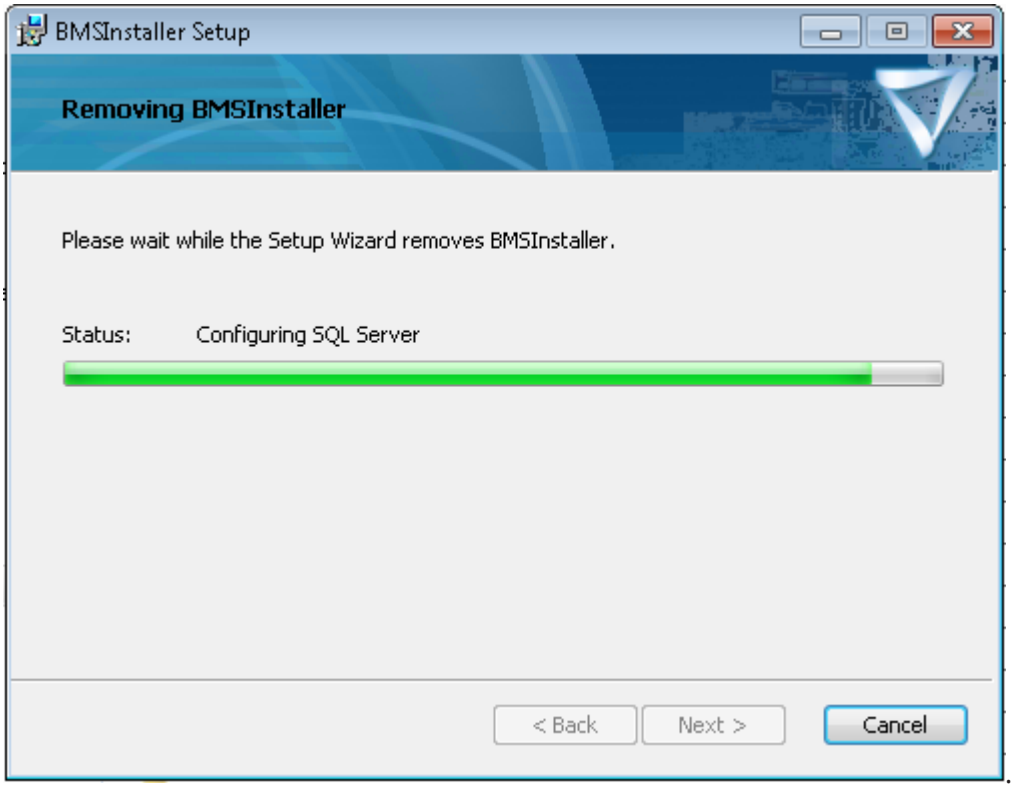
3. To open the Program Maintenance dialog, click **Next**.



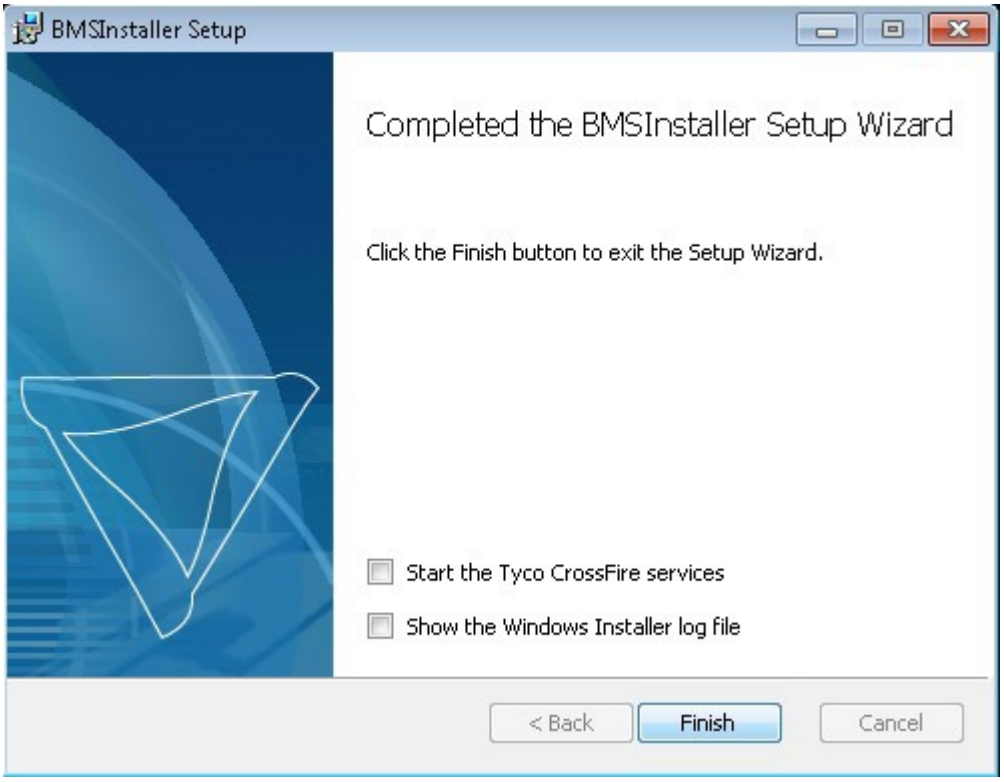
4. Select **Remove** and click **Next**. The Uninstall Options appears for you to choose whether or not to drop BMS Database. To drop the database, select the check box and then click Remove. To keep the database, click **Remove**.



The **Removing BMSInstaller** dialog box opens showing the uninstalling progress.



After a few minutes, the **Completed the BMSInstaller Setup Wizard** dialog box appears.



5. To complete uninstalling, dlick **Finish**.

BACnet Device Discovery

BMS integration automatically detects BACnet devices on the network and creates the corresponding devices and objects in C•CURE 9000 and can manually import BACnet objects for the specific BACnet device.

The integration can discover BACnet devices and its objects automatically by broadcasting WHO-IS and receiving I-AM message through BACnet protocol. And user is allowed to choose and save the devices and objects to be imported.

The integration also support manually import BACnet objects for the specific BACnet device.

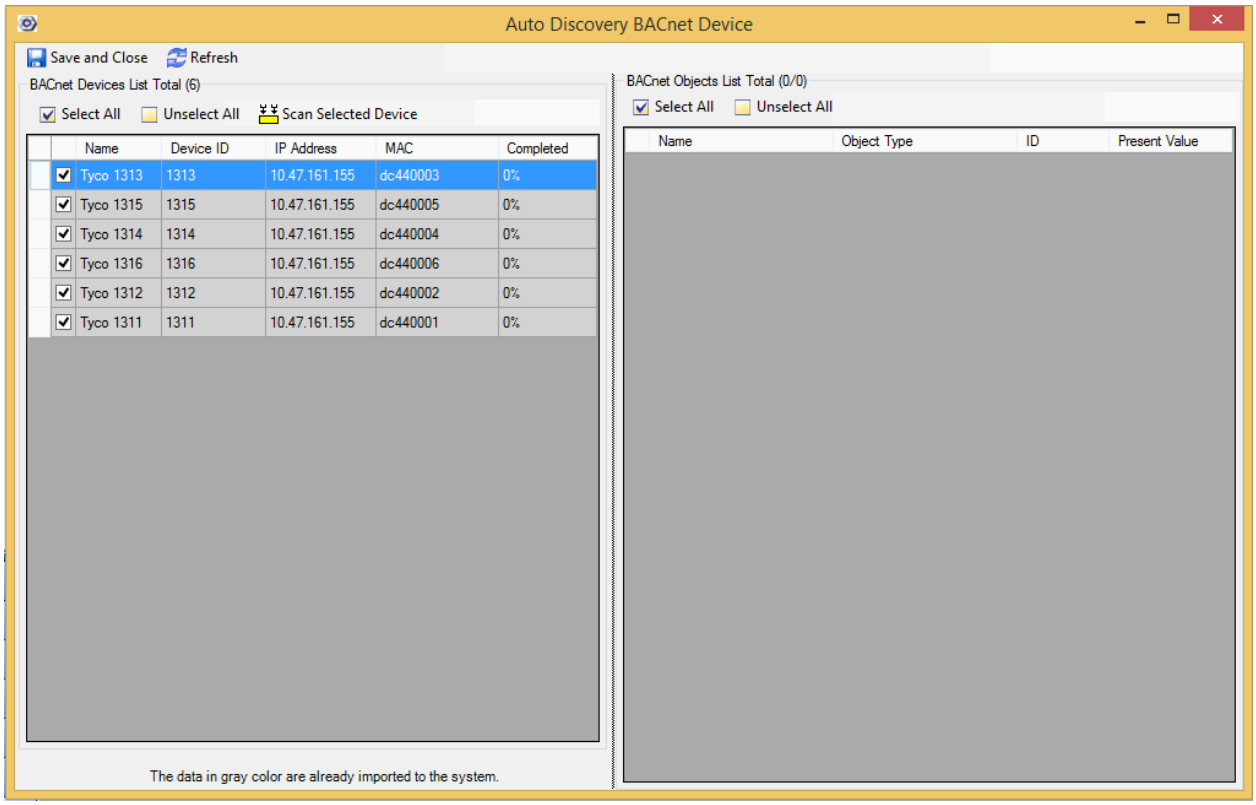
Auto Discovery BACnet Devices

Perform the following steps to auto discovery BACnet Devices on the network and create the corresponding devices and objects in C•CURE 9000.

1. On the navigation tree, select **Building Automation** to open the **Building Automation** pane.
2. Right click the BACnet Device folder, and select **Auto Discovery**.

   The **Auto Discovery BACnet Devices** window lists the detected BACnet devices on the left grid, and shows the total number of detected BACnet device right above this grid. The devices in gray are already imported into system.

Figure 8: Auto Discovery BACnet Devices - Device list



The following table describes the fields of the BACnet Device list grid.

Table 2: BACnet Device List Grid Descriptions

Fields	Descriptions
Name	BACnet device name
Device ID	BACnet device ID, which must be unique on the network.
IP Address	IP address of BACnet device
MAC	MAC address of BACnet device
Completed	The completed percent of BACnet objects been detected on the specific device. The value will refresh during devices scan.

ⓘ **Note:** Auto discovery BACnet Devices may take a few seconds or minutes, which depends on the network speed and object amount on the device.

3. Tick the devices wanted to be imported, then click **Scan Selected Device**.

   The BACnet objects on the selected devices appear in the list on the right grid. By default, all BACnet objects are selected. Clear the check boxes for any objects that you do not want to import. The objects in gray are already imported into system.

Figure 9: Auto Discovery BACnet Devices - Object list

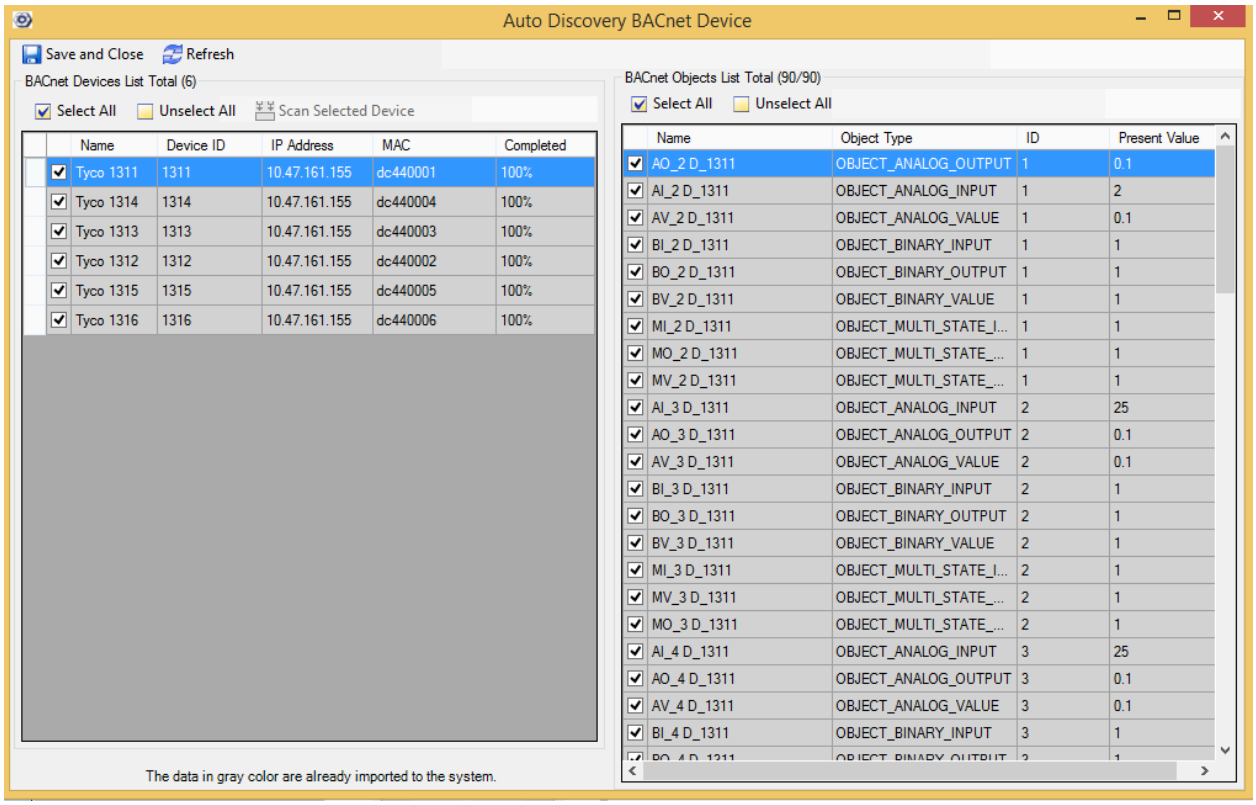


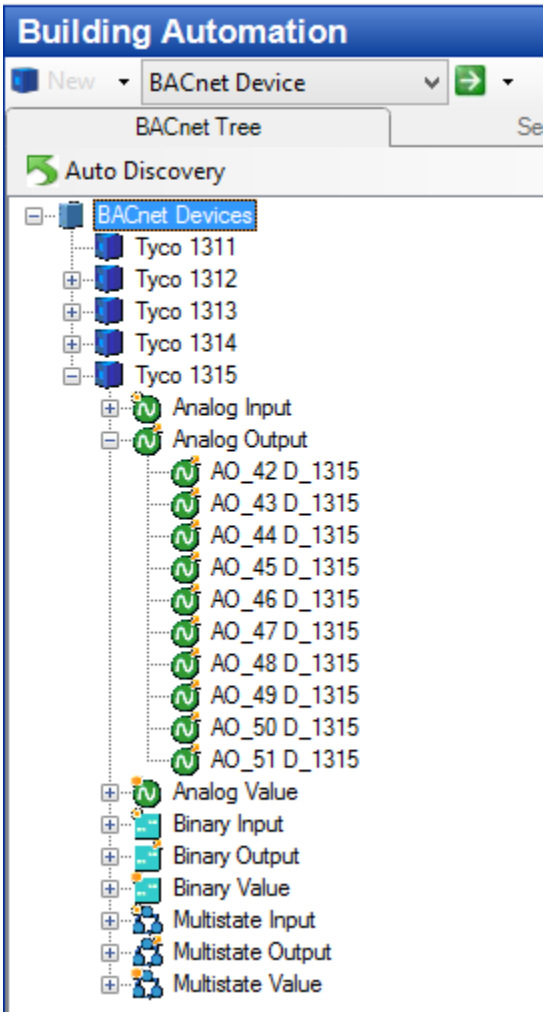
Table 3: BACnet Object List Grid Descriptions

Field	Description
Name	BACnet object name.
Object Type	BACnet object type. Valid value:Binary Input, Binary Output, Binary value, Analog Input, Analog Output, Analog value, Multistate Input, Multistate Output, Multistate Value and Schedule.
ID	BACnet object ID.
Present Value	Present value of the specific object.

4. Click **Save and Close**.

All selected BACnet devices and objects display on the Building Automation navigation tree.

Figure 10: BACnet tree



BACnet objects are categorized by object type on Building Automation navigation tree.

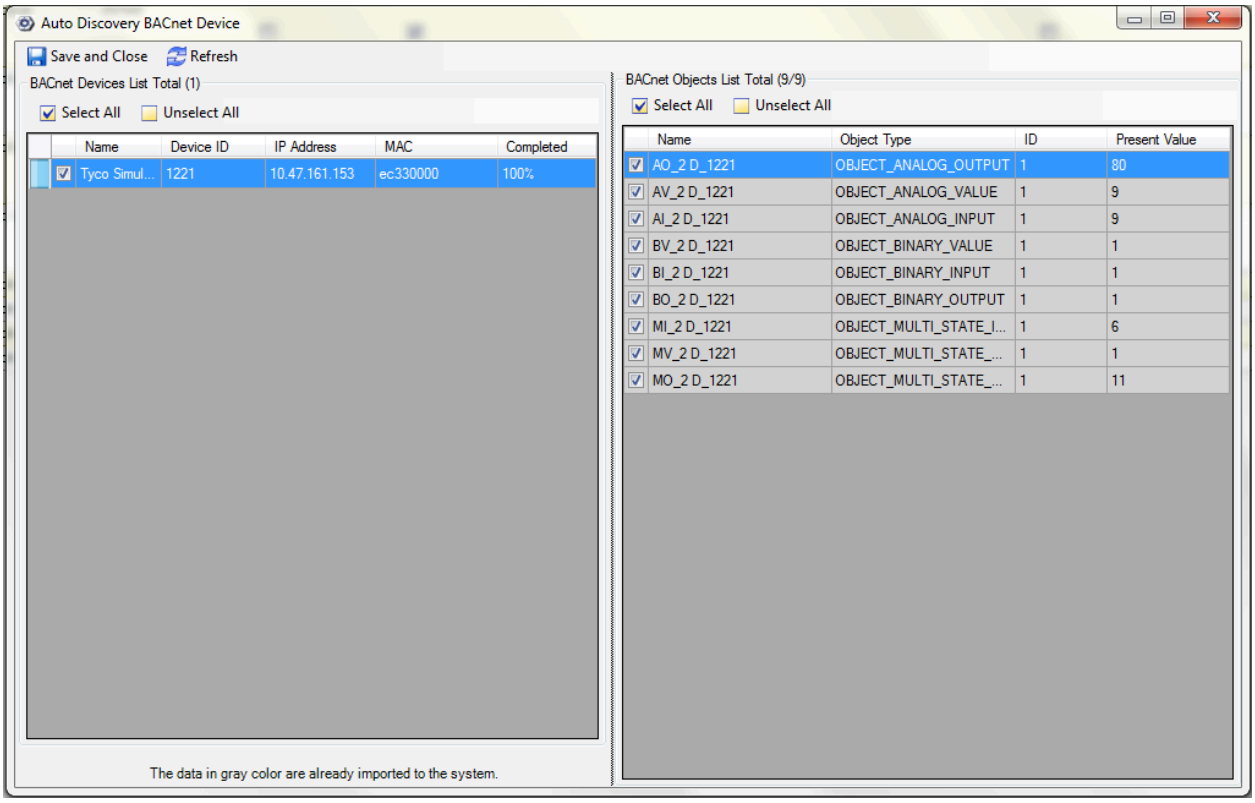
Importing Device Objects Manually

About this task:
Perform the following steps to import device objects for the specific BACnet device.

1. On the navigation tree, select Building Automation to open the **Building Automation** pane.
2. Expand the **BACnet Devices** folder.
3. Right click the desired BACnet device, and select **Import Device Objects**.

   The **Auto Discovery BACnet Devices** window opens, and retrieves BACnet objects in this device. When retrieval BACnet objects 100% completed, all available BACnet objects listed on the right grid.

Figure 11: Import Device Objects



4. By default, all BACnet objects are ticked. Untick the objects if you don't want to import. The objects in gray are already imported into system.
5. Click **Save and Close**. All selected BACnet devices and objects display on the Building Automation navigation tree.

BACnet Device Editor Overview

The BACnet device represents the BACnet device in the C•CURE 9000 database.

Accessing the BACnet Device Editor

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click Building Automation. The Building Automation pane opens.
2. Expand the **BACnet Device** folder.
3. To open the BACnet device editor to edit an existing BACnet device, double-click a BACnet device icon or name or right- click a BACnet device and select **Edit** from context menu.

   The BACnet Device Editor opens with the General tab visible.

Adding a BACnet Device Object

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Right-click the BACnet Device folder, then select **New** from context menu, the BACnet device editor opens.

3. Type a unique name in the **Name** field.
4. Type a textual description for the BACnet device in the **Description** field.
5. SeeBACnet Device General Tab to configure communication information. **NOTE**

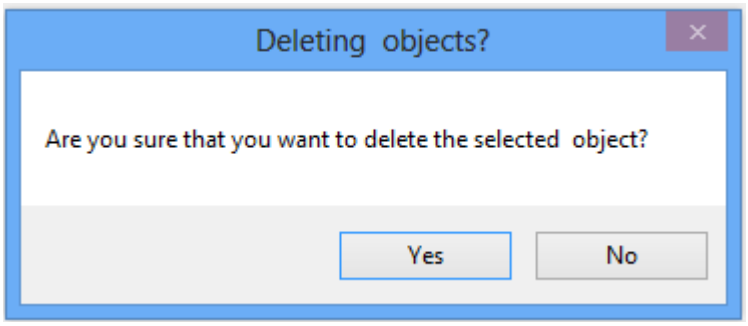
   ⓘ **Note:** If the Network ID of the BACnet device is 0, MAC Address is not necessary, but if Network ID is not 0, you must enter MAC Address to identify device.
6. Select the Data Update Mechanism used for all sub objects of this BACnet device.
7. Check the **Enabled** option to connect to BACnet physical device.
8. Click the **Triggers** tab to configure Triggers for the BACnet device.
9. Click the **State Images** tab to view the state images for the BACnet device, and optionally customize the state images.
10. If you are done editing the BACnet device, click to save the BACnet device configuration.

Deleting a BACnet Device Object

You can delete a BACnet device from the Building Automation tree or from the dynamic view if you no longer need it.

Deleting a BACnet Device Object from the Building Automation Tree

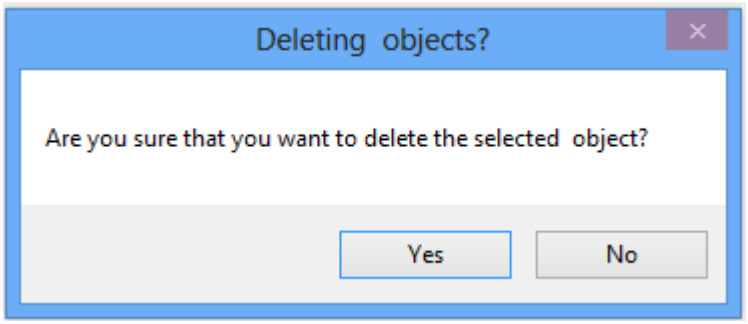
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Open the BACnet Device folder by clicking to the left of folder.
3. Right-click a BACnet device object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.



4. Click **Yes**. After a while, this BACnet device object and all BACnet objects in this device are deleted from Building Automation tree and C•CURE 9000 database.

Deleting a BACnet Device Object from the Dynamic View

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Select BACnet Device from Building Automation pane drop-down list.
3. Click to open a Dynamic View showing all BACnet Devices objects.
4. Right-click a BACnet device object to be deleted and select **Delete** from context menu.
   A confirmation dialog box opens.

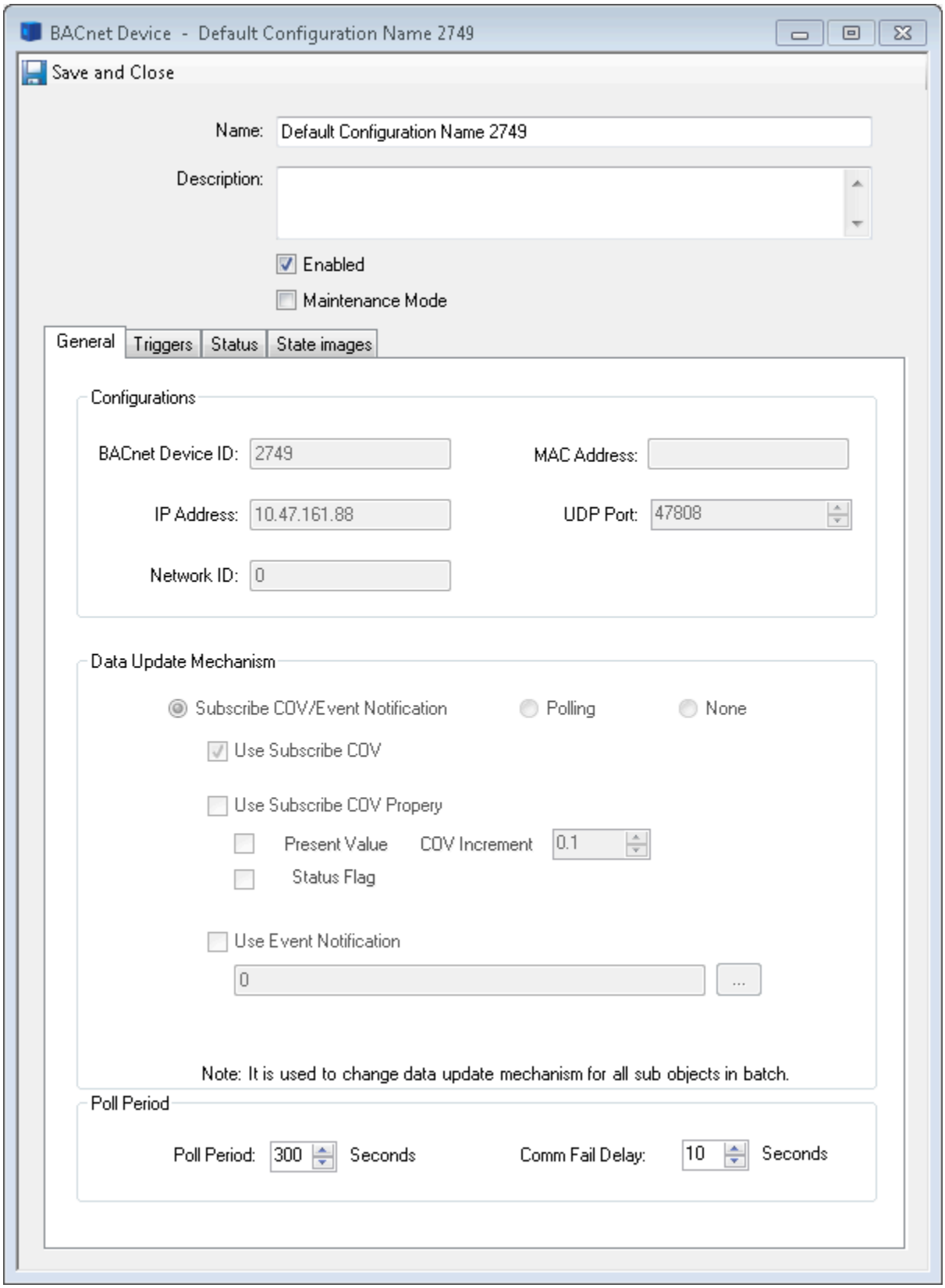


5. Click **Yes**. After a while, this BACnet device object and all BACnet objects in this device are deleted from Building Automation tree and C•CURE 9000 database.

BACnet Device General Tab

From the BACnet Device General tab, you can set the name and description for the BACnet device, and configure the communication settings for the device.

Figure 12: BACnet Device - General Tab



BACnet Device General Tab Definitions

The BACnet Device General tab includes the fields described in the following table.

Table 4: BACnet Device General Tab Definitions

Field	Description
Name	Enter a unique name up to 50 characters long for BACnet Device. If you enter the name of an existing object, the system will not save the object, and will display an error message indicating there is a conflict. Choose a different name.
Description	Enter a general comment about the BACnet device that will help you identify the device. This text is for information only.
Enabled	Select the Enabled option to connect to BACnet device and update status if connecting successfully, or clear this option to disable the BACnet Device. The default value is enabled. You can change IP Address and UDP port when disabled BACnet device.
Configuration	
BACnet Device ID	BACnet device ID, which must be unique on the network. Read only.
MAC Address	MAC address of BACnet device. Read only.
IP Address	BACnet IP address used to connect to the physical device, which must be unique on the network. Editable when BACnet device is disabled.
UDP Port	UDP port of BACnet device used to communicate with the physical device. Editable when BACnet device is disabled.
Network ID	Network ID of BACnet device.
Data Update Mechanism	When BACnet device is disabled, you can set data update mechanism for BACnet objects in this device. All BACnet objects' data update mechanism will change accordingly if you confirmed this change. Valid value: Subscribe COV/Event Notification, Polling, None. Please refer to BACnet Object General Tab Definitions on Page 47 to get the detailed description.
Poll Period	
Poll Period	Set poll interval, at which the integration will automatically check if the physical device is online. The default value is 300 seconds. Please increase the poll period accordingly when BACnet object amount increases.
Comm Fail Delay	Set the comm fail delay time. The default value is 5 seconds.

Configuring a BACnet Device Object

About this task:
You can use the BACnet Device Editor to configure settings for BACnet device. To Configure a BACnet Device Object complete the following steps.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Open the BACnet Device folder by clicking  to the left of folder.
3. Double-click a BACnet device icon or name or right-click a BACnet device and select **Edit** from context menu, the BACnet device editor opens.

4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet device in the **Description** field.
6. See "BACnet Device General Tab" on page 4-6 to configure communication information and Data Update Mechanism.
7. Select the Data Update Mechanism used for all sub objects of this BACnet device.
8. Check the **Enabled** option to connect to BACnet physical device.
9. You can click the **Triggers** tab to configure Triggers for the BACnet device.
10. You can click the **State Images** tab to view the state images for the BACnet device, and optionally customize the state images.
11. If you are done editing the BACnet device, click to save the BACnet device configuration.

BACnet Device Triggers Tab

C•CURE 9000 uses Triggers, which are configured procedures for activating events based on properties of an object. A Trigger automatically executes a specified Action when a particular predefined conditions occurs. The following image shows the BACnet Device Triggers tab.

Figure 13: BACnet Device Triggers Tab

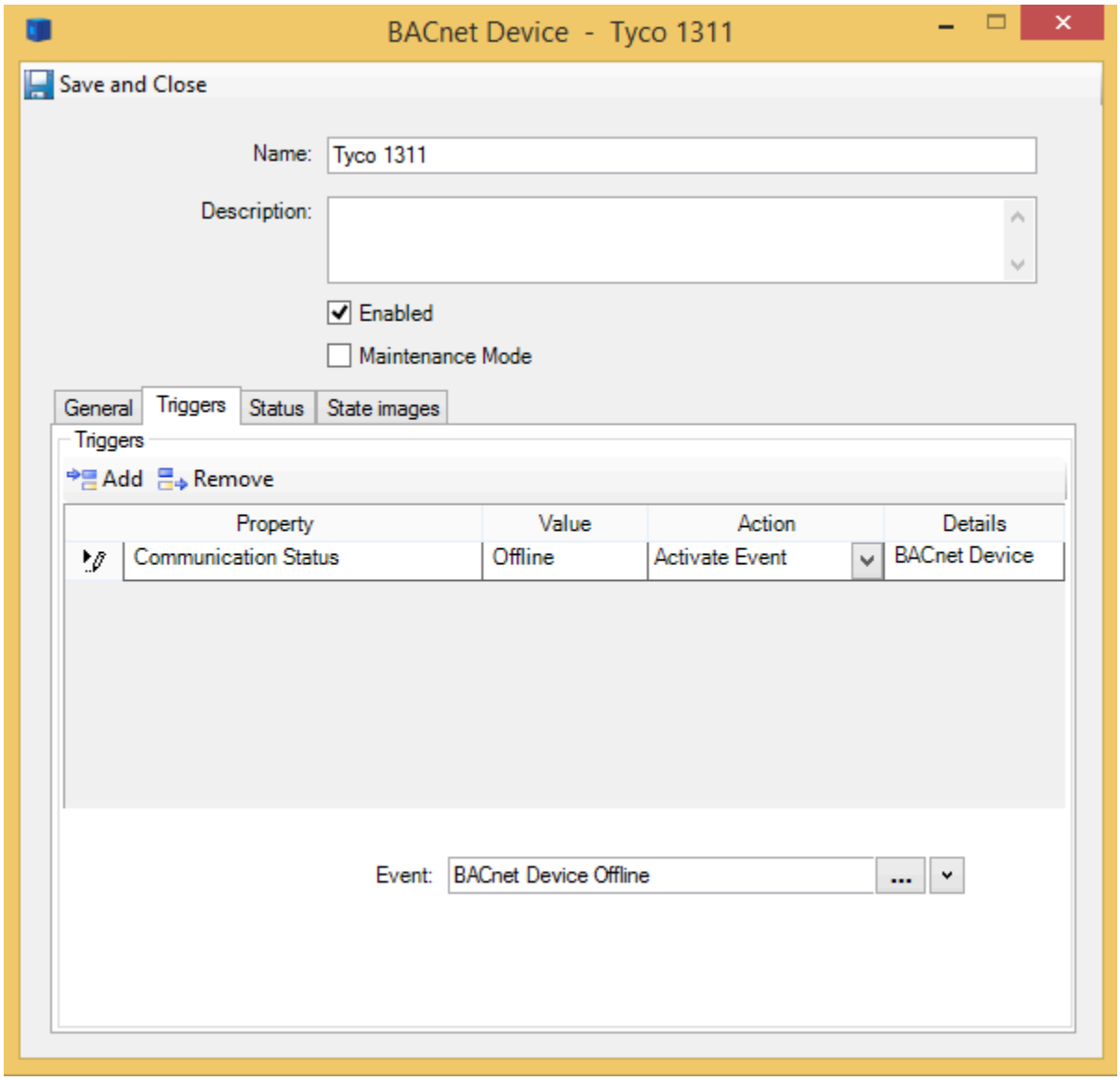


Table 5: Trigger Tab Setting Example

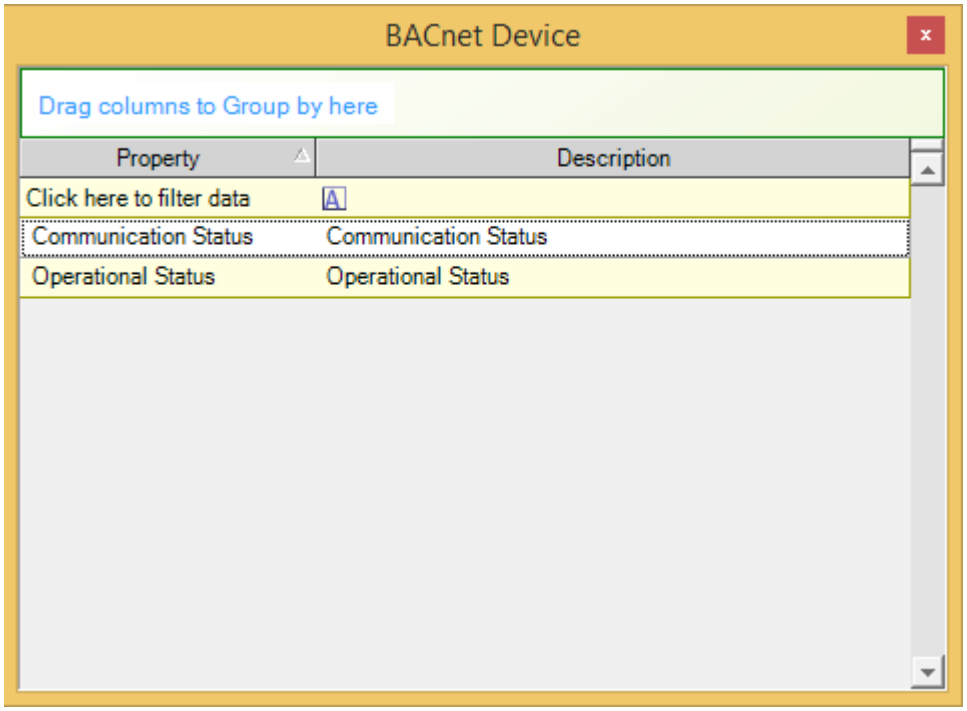
The following Triggers tab settings				
Property	**Value**	**Action**	**Details**	**Schedule**
Online Status	Online	Activate Event	BACnet Device Event	Always
Would create the following Trigger: Anytime (Always Schedule) the Online Status (Property) equals Online (Value), activate the event (Action) named BACnet Device Event (Details). BACnet Device Event is an event that you would need to create using the Event Editor. For information about how to create and configure an event, refer to the *C•CURE 9000 User Software Configuration Guide*.				

Table 6: BACnet Device Triggers Tab Definitions

Field	Description
Add	Click Add in the Triggers tab to create a new trigger.
Remove	Click Remove in the Triggers tab to delete a new trigger.
Property	Click within the Property column, and then click ... . The Property browser opens presenting properties available for the Panel. Click a Property to select it and add it to the column. The available properties are Communication Status and Operational Status.
Value	Click within the Value column to display a drop-down list of Values associated with the Property that you have selected. Click a Value you want to include as a parameter for the trigger to assign it to the column. The possible values are: • Communication Status: Online/Offline • Operational Status: Operational/Non-operational
Action	Click within the Action column to display a drop-down list of valid actions. Click on Action that you want to include as a parameter for the trigger to add it to the column.
Details	Displays details about how the Action was configured.
Schedule	Only the Always Schedule is available for BACnet Device triggers.

Creating a Trigger for BACnet Device

1. From the BACnet Device Editor, navigate to the **Triggers** tab.
2. Click Add in the **Trigger** tab to create a new trigger.
3. Click ... within the **Property** column to open the BACnet Device dialog box showing Properties available for the device.



4. Click a Property to select it and add it to the Property column.
5. Click within the **Value** column to display a drop-down list. Click the Value that you want to include as a parameter for the trigger to add it to the column.
6. Click within the **Action** column to display a drop-down list of valid actions. Now only **Activate Event** is available. When you select an Action, the lower pane in the Trigger box displays an Event field for you to define the Action details.
7. Click ... to open Event Dialog. Select an Event that you want to associate with the trigger. After you define the Action details, the Details column displays information about how the Action has been configured.
8. Click **Save and Close** to save the BACnet Device with the Trigger you configured.

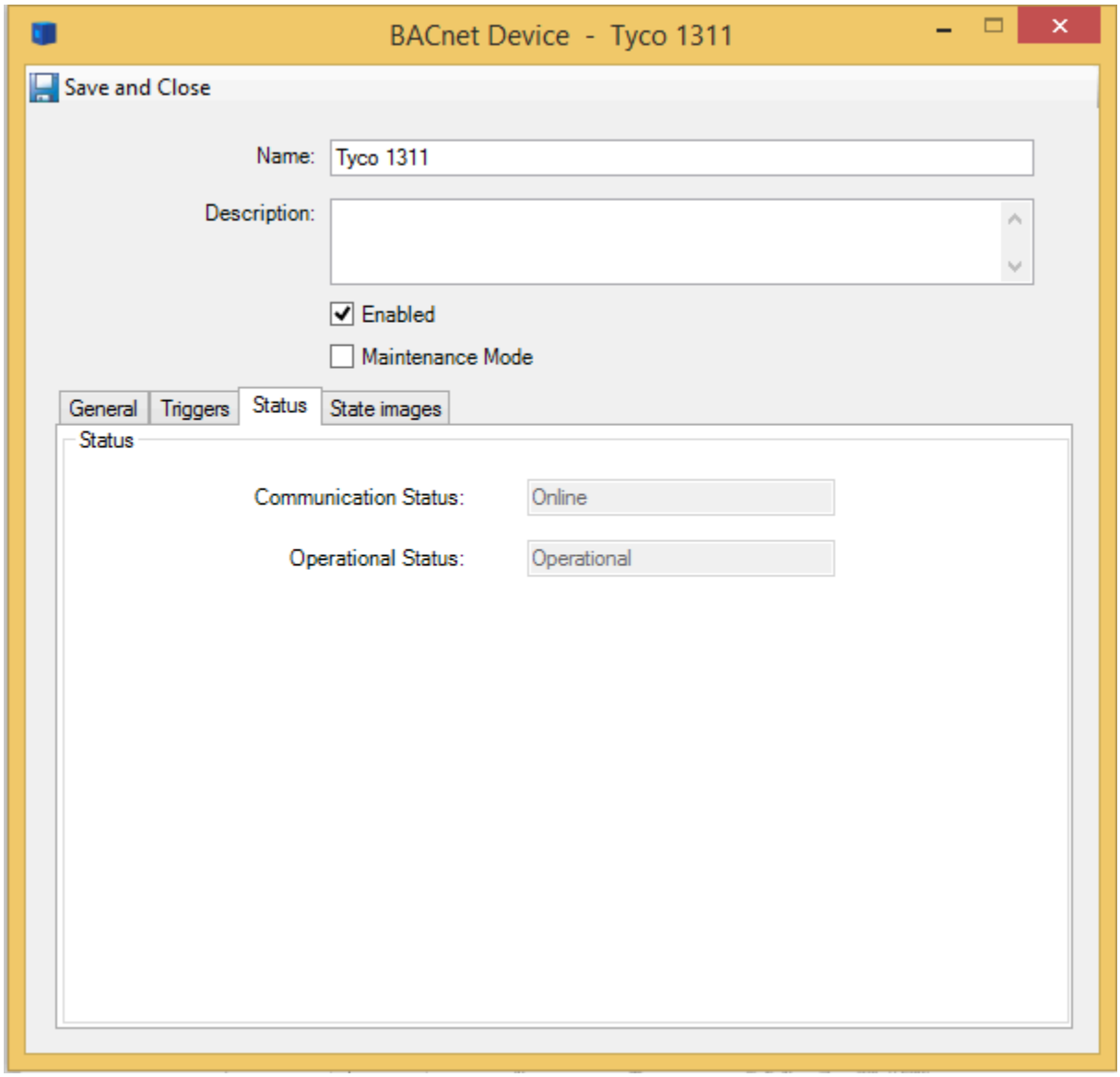
Removing a trigger

1. From the BACnet Device Editor, navigate to the **Trigger** tab.
2. Use ▶ to select the row in the Trigger table for the Trigger you want to remove.
3. Click **Remove**.
4. Click **Save and Close**.

BACnet Device - Status Tab

The BACnet Device Status tab provides read-only status information about the BACnet Device.

Figure 14: BACnet Device Status Tab



BACnet Device Status Tab Definitions

The following table provides BACnet Device Status tab definitions.

Table 7: BACnet Device Status Tab Definitions

Field	Value	Definition
Communication Status	Online	The server is successfully connected to the BACnet physical device.
	Offline	The server tries to connect to the BACnet physical device, but fails.
	Unknown	Server stops

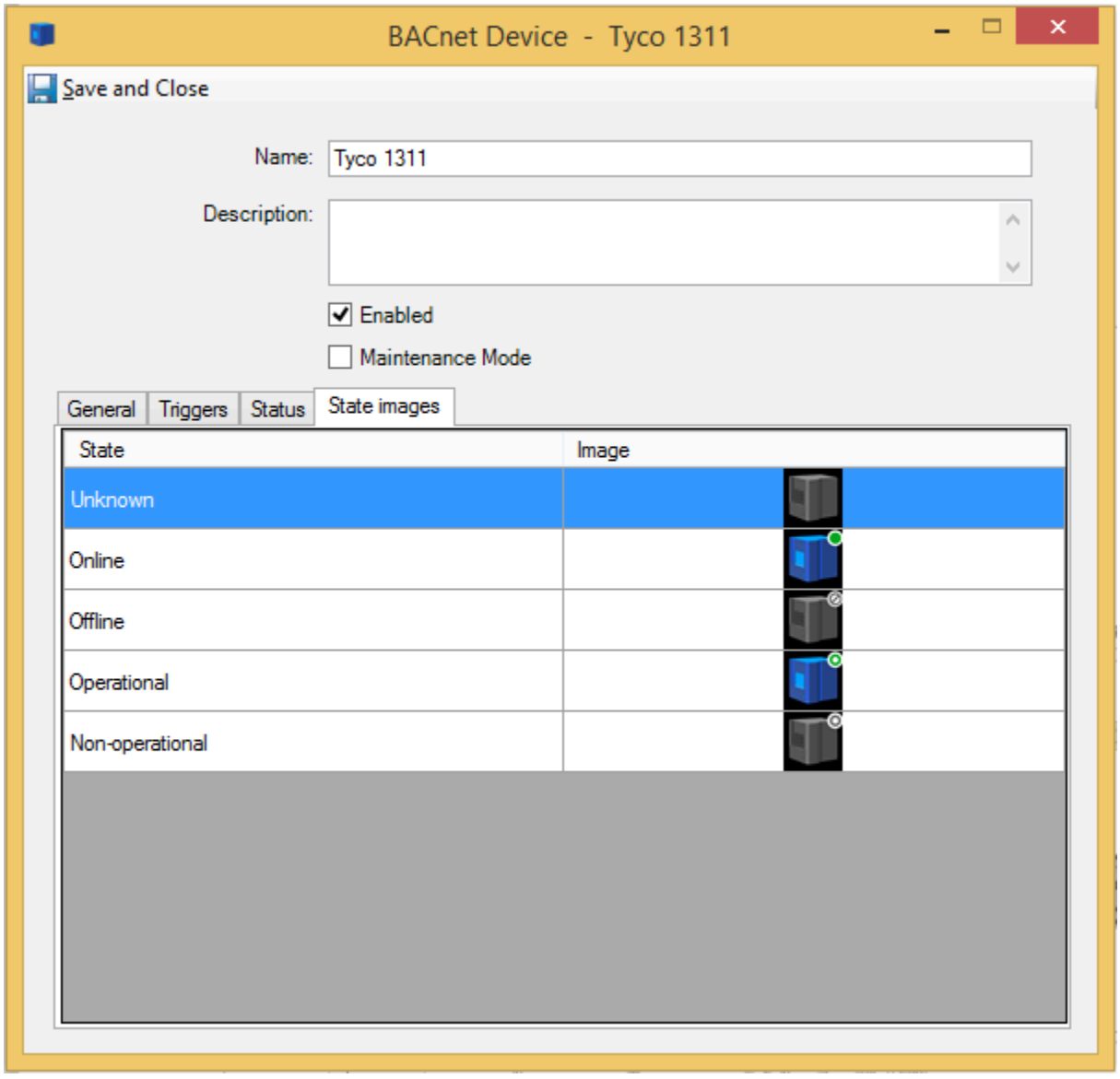
Table 7: BACnet Device Status Tab Definitions

Field	Value	Definition
Operational Status	Operational	The server can communicate with BACnet device successfully.
	Non-operational	The server can't communicate with BACnet device successfully.

BACnet Device - State Images Tab

From the BACnet Device State Images tab, you can change the default images used to indicate the BACnet Device states on the Monitoring Station.

Figure 15: BACnet Device State Images Tab



You can replace the default images with JPG formatted files of your choice, to uniquely identify your objects when activities are displayed on the Monitoring Station Client.

Customizing State Images for a BACnet Device

From the BACnet Device State Images tab, you can change the images that appear in the Monitoring Station to represent BACnet Devices.

Customize BACnet Device State Images

1. From the **BACnet Device State Images** tab, double-click the existing image. A Windows Open dialog box appears allowing you to browse for a folder in which you have placed replacement images.
2. When you locate the replacement image, select it and click **Open** to replace the default image with this image.
3. When you are done editing the BACnet Device, click **Save and Close** to save the device configuration.

Restore the Default State Image

1. From the **BACnet Device State Images** tab, select an existing image.
2. Right-click the image and select **Restore Default**.
3. Click **Save and Close** to save the device configuration.

BACnet Object Editor Overview

The BACnet Object represents the BACnet Object in the C•CURE 9000 database.

Accessing the BACnet Object Editor

About this task:
Perform the following steps to access the BACnet Object editor to edit an existing BACnet Object.

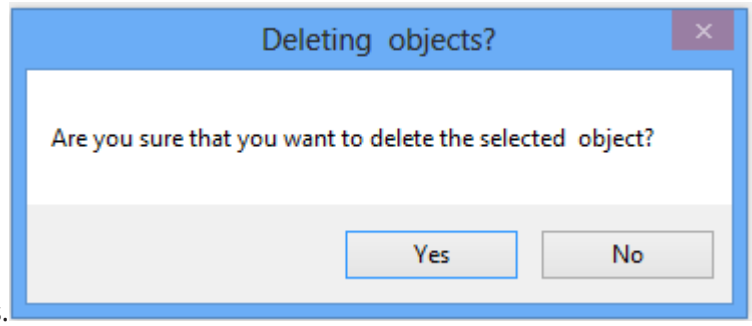
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. In the **Building Automation** pane, expand the **BACnet Object** folder.
3. To open the BACnet Object editor, select one of the following options:
   - Double-click a BACnet Object icon or name.
   - Right-click a BACnet Object and select **Edit** from context menu. The BACnet Object Editor opens with the General tab visible.

Deleting a BACnet Object from the Building Automation Tree

About this task:
To Delete a BACnet Object from the Building Automation Tree

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click Building Automation.
2. In the **Building Automation** pane, expand the **BACnet Object** folder.
3. Right-click a BACnet Object to be deleted and select **Delete** from context menu.

A confirmation dialog box opens.



4. Click **Yes**. After a while, this BACnet Object is deleted from Building Automation tree and C•CURE 9000 database.

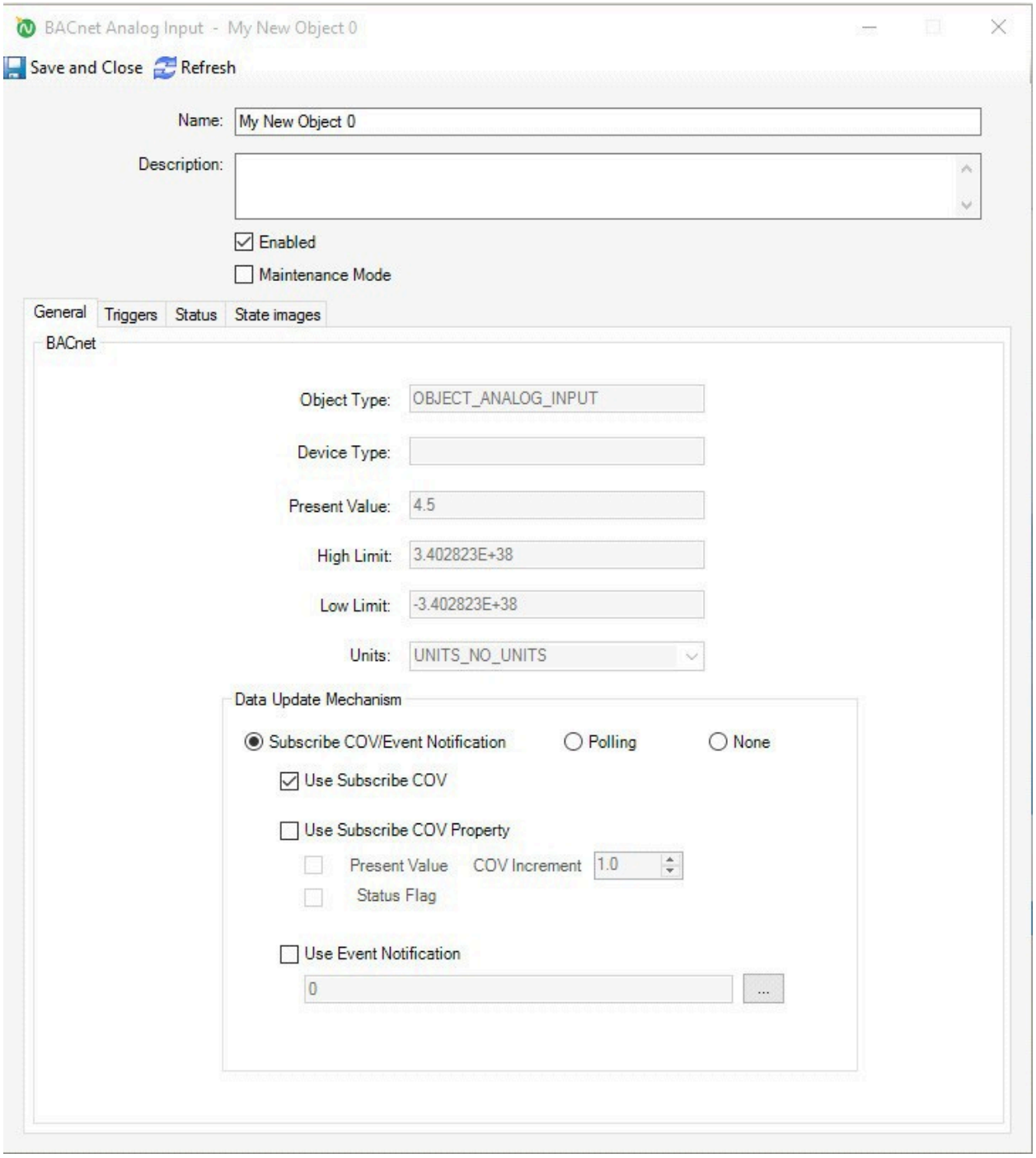
Deleting a BACnet Object from the Dynamic View

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Select **BACnet Object** from the **Building Automation** pane drop-down list.
3. Click to open a Dynamic View showing all BACnet Objects.
4. Right-click a BACnet Object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.
5. Click **Yes**. After a while, this BACnet Object is deleted from Building Automation tree and C•CURE 9000 database.

BACnet Object - General Tab

From the BACnet Object General tab, you can set the name and description for the BACnet Object, and configure the communication settings for the device.

Figure 16: BACnet Object - General Tab



BACnet Object General Tab Definitions

The following table contains descriptions of the BACnet Object General tab fields.

Table 8: BACnet Object General Tab Definitions

Field	Description
Name	Enter a unique name up to 50 characters long for BACnet Device. If you enter the name of an existing object, the system will not save the object, and will display an error message indicating there is a conflict. Choose a different name.
Description	Enter a general comment about the BACnet device that will help you identify the device. This text is for information only.
Enabled	Click Enabled to allow the BACnet object to establish the communication with the physical device.
Object Type	BACnet object type. Valid value: ANALOG_INPUT, ANALOG_OUTPUT, ANALOG_VALUE, BINARY_INPUT, BINARY_OUTPUT, BINARY_VALUE, MULTI- STATE_INPUT, MULTI-STATE_OUTPUT, MULTI-STATE_VALUE. Read only.
Device Type	Text description of the physical device connected to the BACnet object. It will typically be used to describe the type of sensor attached to the BACnet object type. Read only.
Present Value	The current value in engineering units of the BACnet object being measured. The present value is writable when Outofservice status is True. Read only.
High Limit	A limit that present value must exceed before an event is generated. Read only.
Low Limit	A limit that present value must fall below before an event is generated. Read only.
Units	The measurement units of this object. Read only.
Data Update Mechanism	
Subscribe COV/Event Notification	?? Use Subscribe COV: Update data by subscribing COV service. When Use Subscribe COV, the subscription period is 28800 seconds (8 hours) by default. BMS integration will automatically re-subscribe before subscription expires. You can change it by the following line in ConnectedPro.HardwareInterface.BACnet.DriverService.exe configuration file located under Installation path\Tyco\CrossFire\ServerComponents. `<add key="COVLifeTimeValue" value="28800"/>` ?? Use Subscribe COV Property: Update Present Value and /or Status Flag by subscribe Present Value and /or Status Flag COV Property service. For Analog object, when check Present value, user can define COV Increment. ?? Use Event Notification: Update status by subscribe Event Notification. To use this mechanism, Notification Class should be pre- configured on real BACnet Device, If subscribed Event Notification Class Required Ack, then BMS integration will list Ack required Event Notification. BMS integration uses 12505 network ID to communicate. You can change it by the following line in ConnectedPro.HardwareInterface.BACnet.DriverService.exe configuration file located under installation path\Tyco\CrossFire \ServerComponents.`<add key="LocalBACnetNetworkID" value="12505"/>`

Table 8: BACnet Object General Tab Definitions

Field	Description
Polling	Update data by poling the value and status. The polling period share the value with BACnet device.
None	None of the mechanisms.

Configuring a BACnet Object

1. In the BACnet Object Editor, from the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. From the **Building Automation** pane, expand the **BACnet Object** folder.
3. To edit the BACnet object, select one of the following methods:
   - Double-click a BACnet Object icon or name.
   - Right-click a BACnet Object and select **Edit** from context menu.
4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet Object in the **Description** field.
6. Select the **Enabled** option to connect to BACnet physical device.
7. to configure data Update Mechanism, see BACnet Object - General Tab.
8. To configure Triggers for the BACnet Object, click the **Triggers** tab.
9. To view the state images for the BACnet Object, click the **State Images** tab , and optionally customize the state images.
10. After you edit the BACnet Object, save the BACnet Object configuration.

Configuring Data Update Mechanism for a BACnet Object

You can use the BACnet Object Editor to configure Data Update Mechanism for a BACnet Object.

Use Subscribe COV/Event Notification to Update Data

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click Building Automation. The Building Automation pane opens.
2. Expand the **BACnet Object** folder.
3. Double-click a BACnet Object icon or name or right-click a BACnet Object and select **Edit** from context menu, the BACnet Object editor opens.
4. Check Subscribe COV/Event Notification radio button to use Alarm and Event services to update data. You can select one or more mechanisms to update data as needed.
   - Select the **Use Subscribe COV** check box to use Subscribe COV service to update data.
   - Select the **Use Subscribe COV Property** check box to use Subscribe COV Property service to update data, you can specify what properties should be subscribed. For now, only Present value and Status Flag properties supported.
   -  Select the **Use Event Notification** check box to use Unconfirmed Event Notification service to update data. Click to retrieve the available Notification Class list, then select the Notification Class ID used to notify events. If there is no Notification class ID available, it means no Notification Class created in real BACnet device.

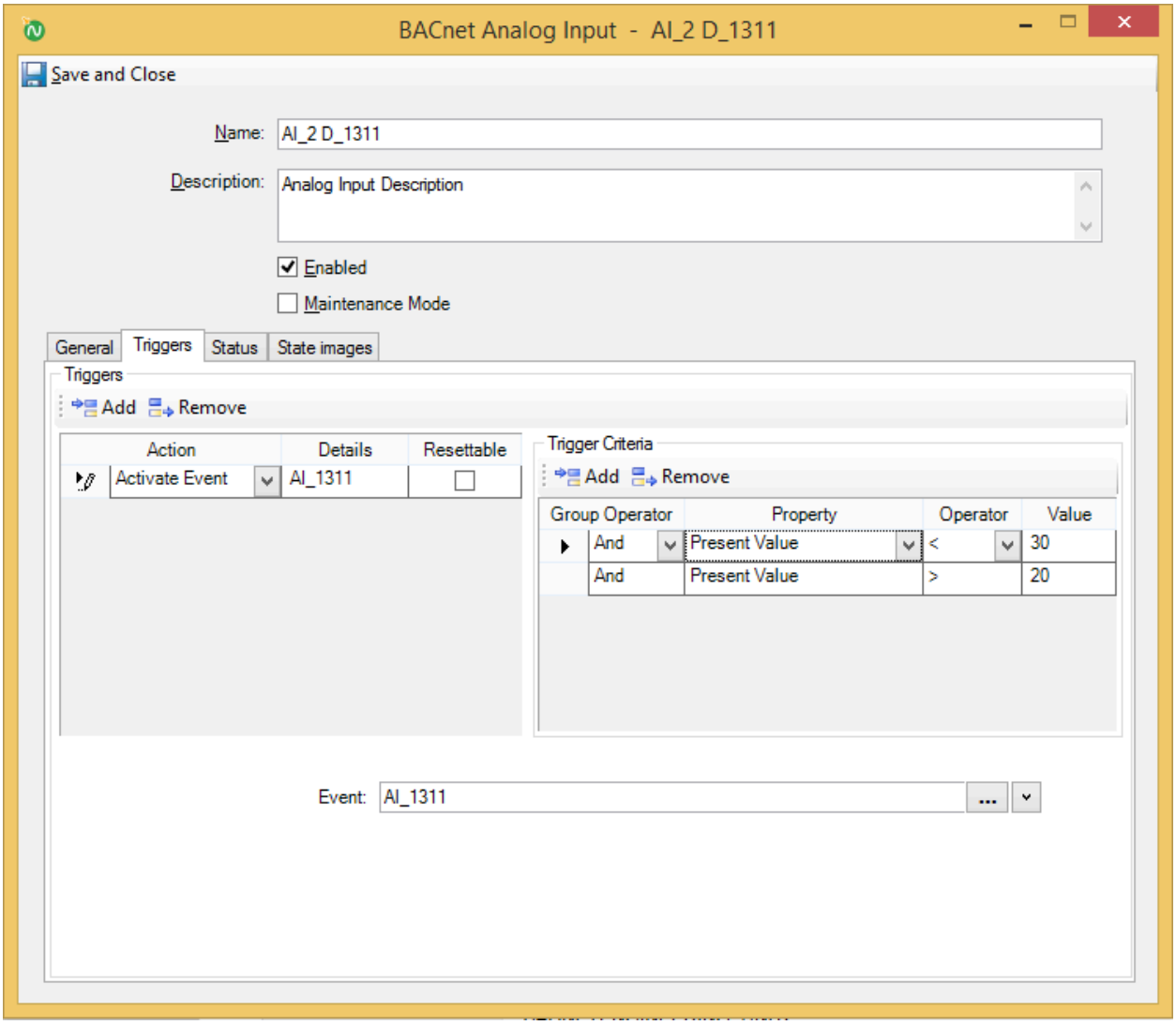
ⓘ **Note:** To use this mechanism, user should add the MAC Address and Network ID(12505 by default) of C•CURE 9000 server to the reception list of the subscribed Notification Class on real BACnet Device.

5. Click Save and Close.

BACnet Object - Triggers Tab

The trigger on BMS integration enhanced to support complex conditions. When the value change on BACnet object matches the particular pre-defined criteria, a trigger automatically executes a specified Action.

Figure 17: BACnet Object Triggers Tab



The following table contains an example of how a Trigger is configured.

Table 9: Trigger Tab Setting Example

The following Triggers tab settings			
Trigger Criteria	**Action**	**Details**	**Schedule**
When the Present Value>20 and the Present Value <30	Activate Event	AI_1311	Always
Would create the following Trigger: Anytime (Always Schedule) the Present Value (Property) > 20 (Value) and the Present Value (Property) <30 (Value), activate the event (Action) named AI_1311 Event (Details). AI_1311 Event is an event that you would need to create using the Event Editor. For information about how to create and configure an event, see the *C•CURE 9000 User Software Configuration Guide*.			

BACnet Object Triggers Tab Definitions

The following table provides definitions of BACnet Object Triggers tab.

Table 10: BACnet Object Triggers Tab Definitions

Field	**Description**		
Add	Click **Add** in the Triggers tab to create a new trigger.		
Remove	Click **Remove** in the Triggers tab to delete a new trigger.		
Action	Click within the Action column to display a drop-down list of valid actions. Click on Action that you want to include as a parameter for the trigger to add it to the column.		
Details	Displays details about how the Action was configured.		
Resettable	Select this check box to indicate that an operator responding to the Event can reset an Action without acknowledging the Event. This allows Monitoring Station personnel to manually reset the action caused by the event. Used to turn off output, such as a siren, activated by the event. Reset actions do not require event acknowledgment.		
Trigger Criteria			
Add	Click **Add** in the Triggers tab to create a new condition.		
Remove	Click **Remove** in the Triggers tab to delete a condition.		
Group Operator	Property	Operator	Value

Table 10: BACnet Object Triggers Tab Definitions

Field		Description	
Only support And operation among conditions. If Or is needed, the user can add another trigger instead.	Alarm Status	=, ≠	Alarm, Normal, Unknown
	Fault Status	=, ≠	Fault, Normal, Unknown
	Out of Service Status	=, ≠	True, False, Unknown
	Present Value	>,>=,=,≠,<,<= except that =, ≠ for binary input, binary output, binary value	User defined value, except that BinaryActive, BinaryInactive, BinaryNull for binary input, binary output, binary value

Defining a Trigger for a BACnet Object

1. From the BACnet Object Editor, navigate to the **Triggers** tab.
2. Click **Add** in the Trigger tab to add a new row, and the Trigger Criteria grid is available to define trigger criteria.
3. Click the **Add** button on the right grid to add a condition.
4. Select a desired property from **Property** dropdown list, select the proper operator from **Operator** dropdown list, then select target value from **Value** dropdown list to create a condition.
5. If the trigger criteria are complex conditions, repeat step 3~4 to create other conditions. Now the Group Operator only support And, so the trigger criteria is true only when all conditions are met.
6. Click within the Action column to display a drop-down list of valid actions. Now only Activate Event is available.

   When you select an Action, the lower pane in the Trigger box displays an Event field for you to define the Action details.
7. Click  to open Event Dialog. Select an Event that you want to associate with the trigger.

   After you define the Action details, the Details column displays information about how the Action has been configured.
8. Click **Save and Close** to save the BACnet Object with the Trigger you configured.

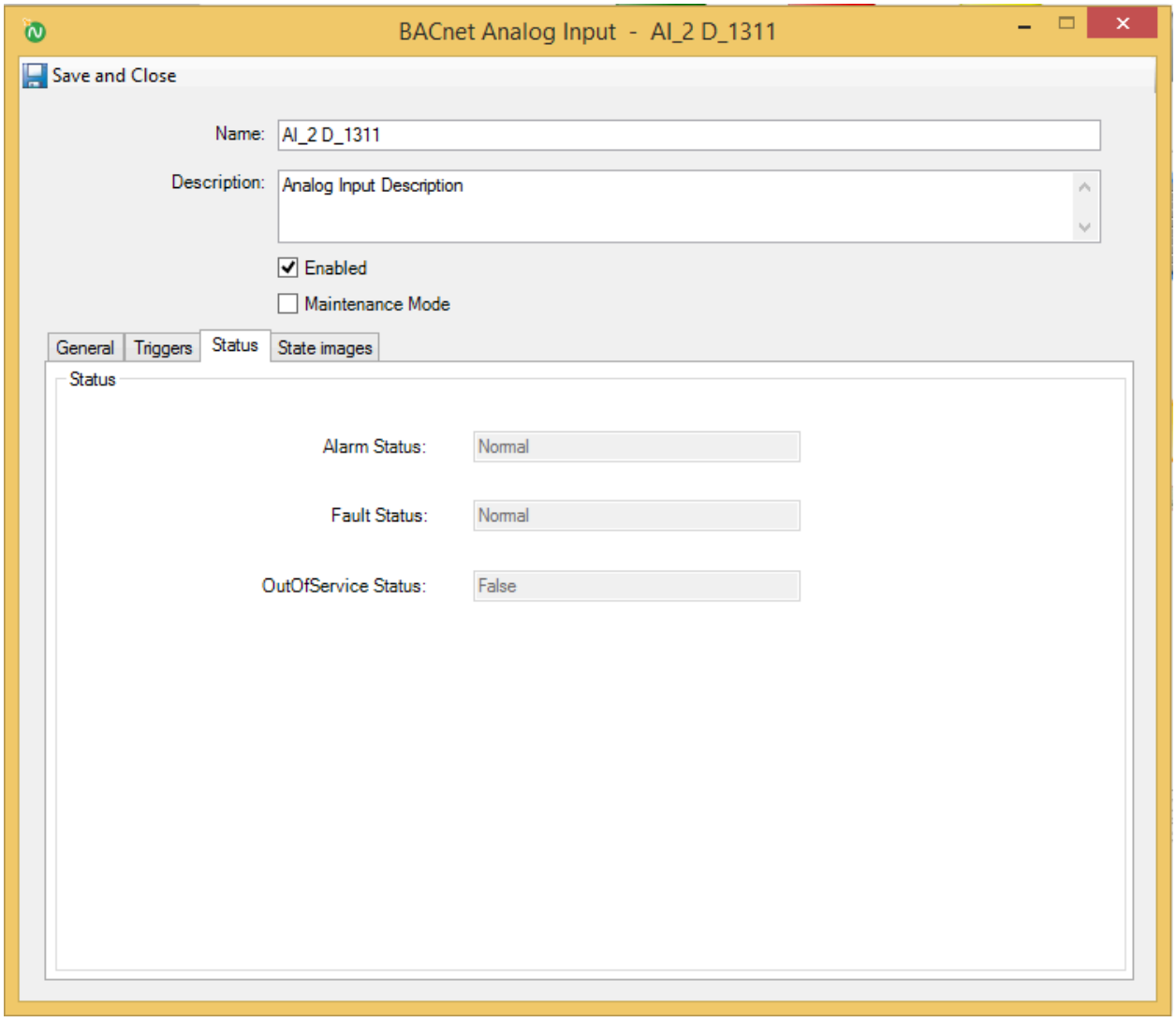
Removing a trigger for a BACnet Object

1. From the BACnet Object Editor, navigate to the **Trigger** tab.
2. Use  to select the row in the Trigger table for the Trigger you want to remove.
3. Click **Remove**.
4. Click **Save and Close**.

BACnet Object - Status Tab

The BACnet Object Status tab provides read-only status information about the BACnet Object.

Figure 18: BACnet Object Status Tab



BACnet Object Status Tab Definitions

The following table provides BACnet Object Status tab definitions.

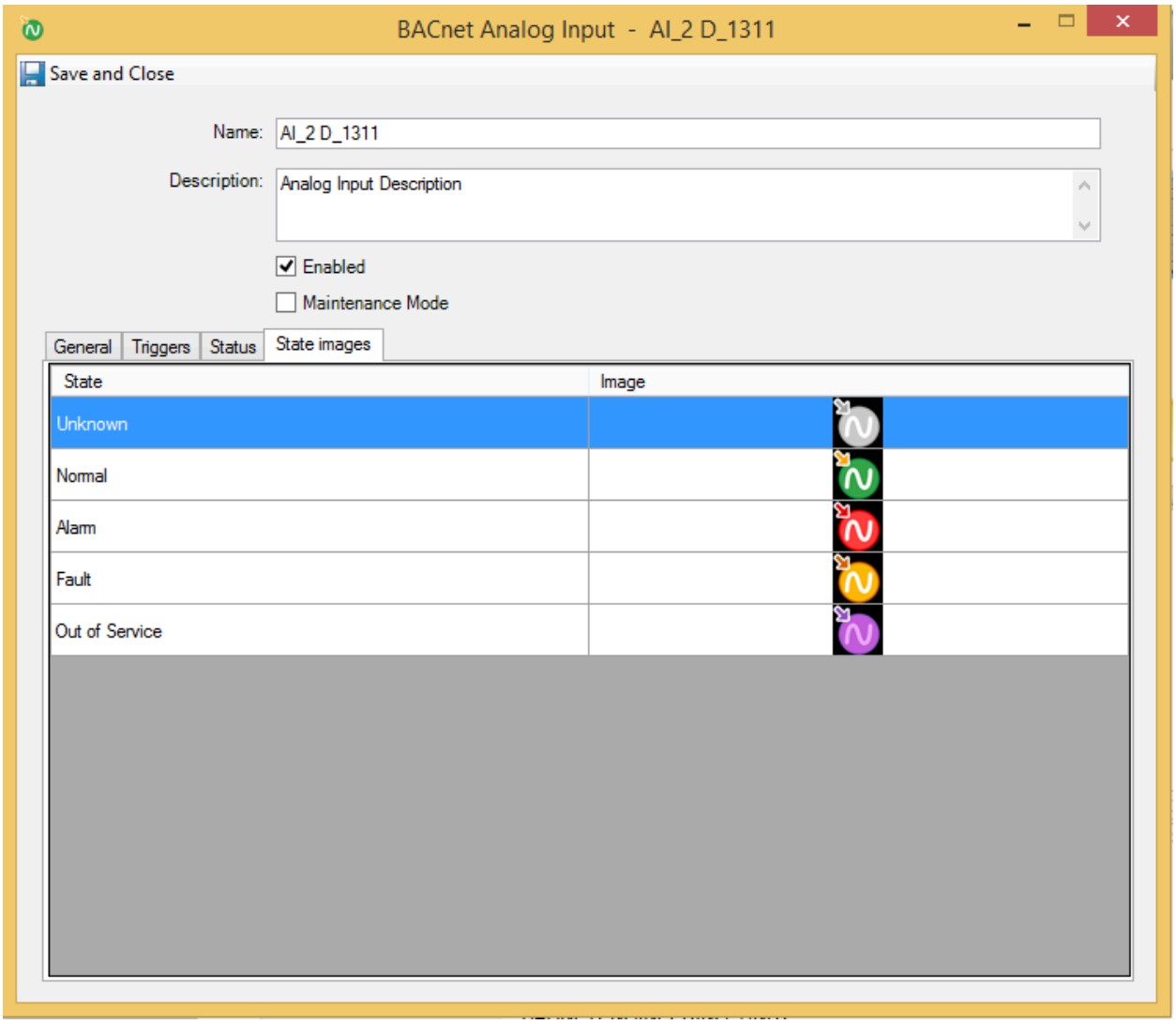
Table 11: BACnet Object Status Tab Definitions

Field	Definition
Alarm Status	Indicate the object is in alarm status. Valid value: Alarm or Normal.
Fault Status	Indicate the object is in fault status. Valid value: Fault or Normal
Out of service Status	Indicates the object is in service or not. Valid value: True or False.

BACnet Object - State Images Tab

From the BACnet Object State Images tab, you can change the default images that indicate the BACnet Object states on the Monitoring Station.

Figure 19: BACnet Object State Images Tab



You can replace the default images with JPG formatted files of your choice, to uniquely identify your objects when activities are displayed on the Monitoring Station Client.

Customize State Images for a BACnet Object

From the BACnet Object State Images tab, you can change the images that appear in the Monitoring Station to represent BACnet Objects.

Customizing BACnet Object State Images

1. From the **BACnet Object State Images** tab, double-click the existing image. A Windows Open dialog box appears allowing you to browse for a folder in which you have placed replacement images.
2. When you locate the replacement image, select it and click **Open** to replace the default image with this image.
3. When you are done editing the BACnet Object, click **Save and Close** to save the device configuration.

Restore the Default State Image

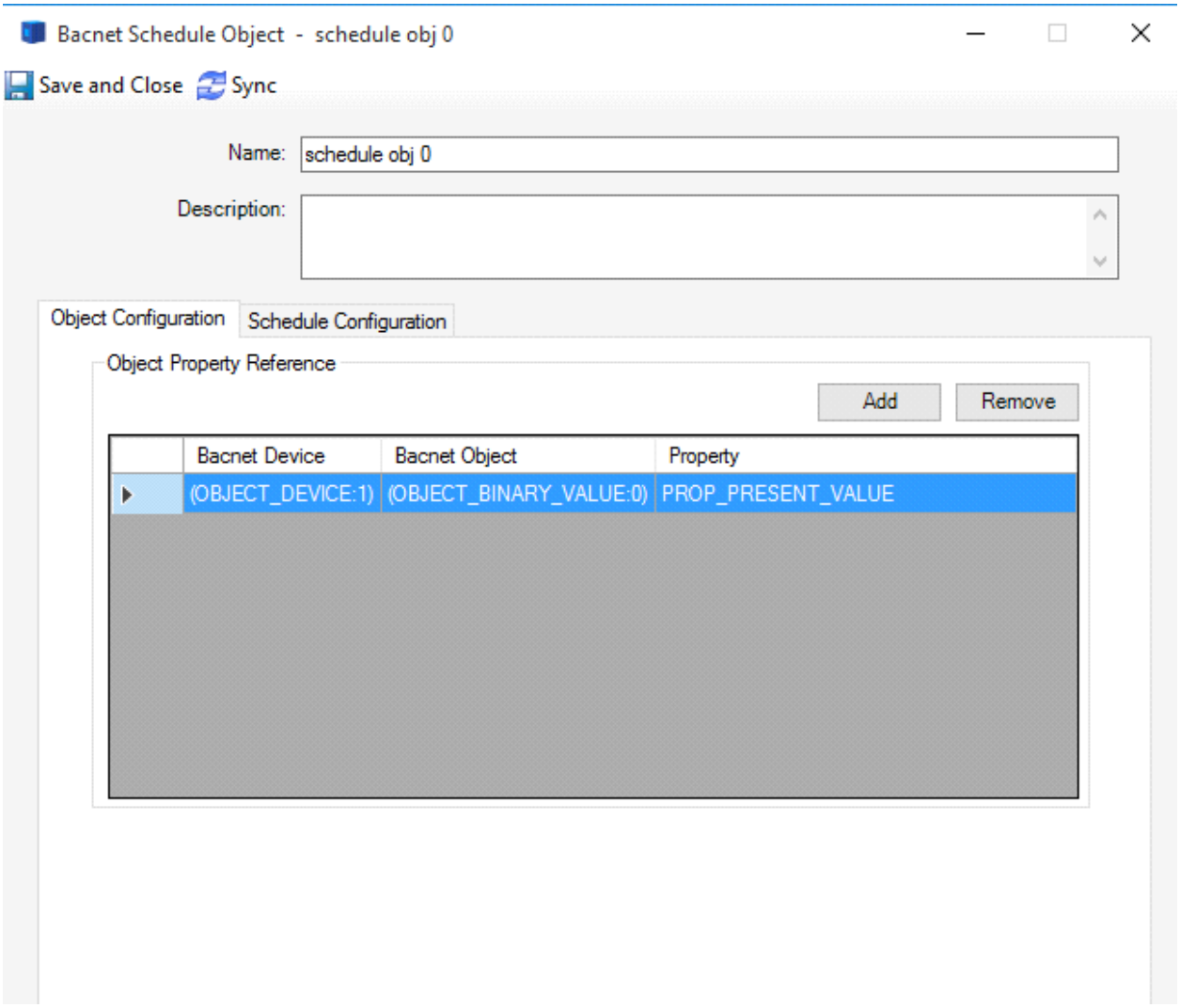
About this task:

1. From the **BACnet device State Image** tab, select an existing image.
2. Right-click the image and select **Restore Default**.
3. Click **Save and Close** to save the device configuration.

BACnet Schedule Object - Object Configuration Tab

From the BACnet Schedule Object - Object Configuration tab, you can set the name and description for the BACnet Schedule Object and configure the Object Property Reference settings for the device.

Figure 20: BACnet Schedule Object - Object Configuration Tab



BACnet Schedule Object - Object Configuration Tab Definitions

The following table describes the fields on the BACnet Schedule Object - Object Configuration tab.

Table 12: BACnet Schedule Object - Object Configurations Tab Definitions

Field	Description
Name	Schedule Name is imported from BACnet device, user can update the Name with up to 50 characters and Name cannot be duplicated with the existing one.
Description	Enter a general comment about the BACnet device that will help you identify the device. This text is for information only.
Object Property Reference	This property specifies the Device Identifiers, Object Identifiers and Property Identifiers of the properties to be written with specific values at specific times on specific days.
BACnet Device	Display device name of the Schedule Objects.
Default Value	This property specifies the Device Identifiers, Object Identifiers and Property Identifiers of the properties to be written with specific values at specific times on specific days. The value must be comply with the object type in object property reference.
Sync Button 	Click the sync button: The Object configuration via victor synchronizes to BACnet Device. **Note**: If you click the save button not the sync button, the schedule date will only be saved to victor database.

BACnet Schedule Object - Schedule Configuration Tab

The BACnet Schedule Object - Schedule Configuration tab, lets you set the name and description for the BACnet Schedule Object, and configure the Period and Schedule settings for the device.

Figure 26: BACnet Schedule Object - Schedule Configuration Tab

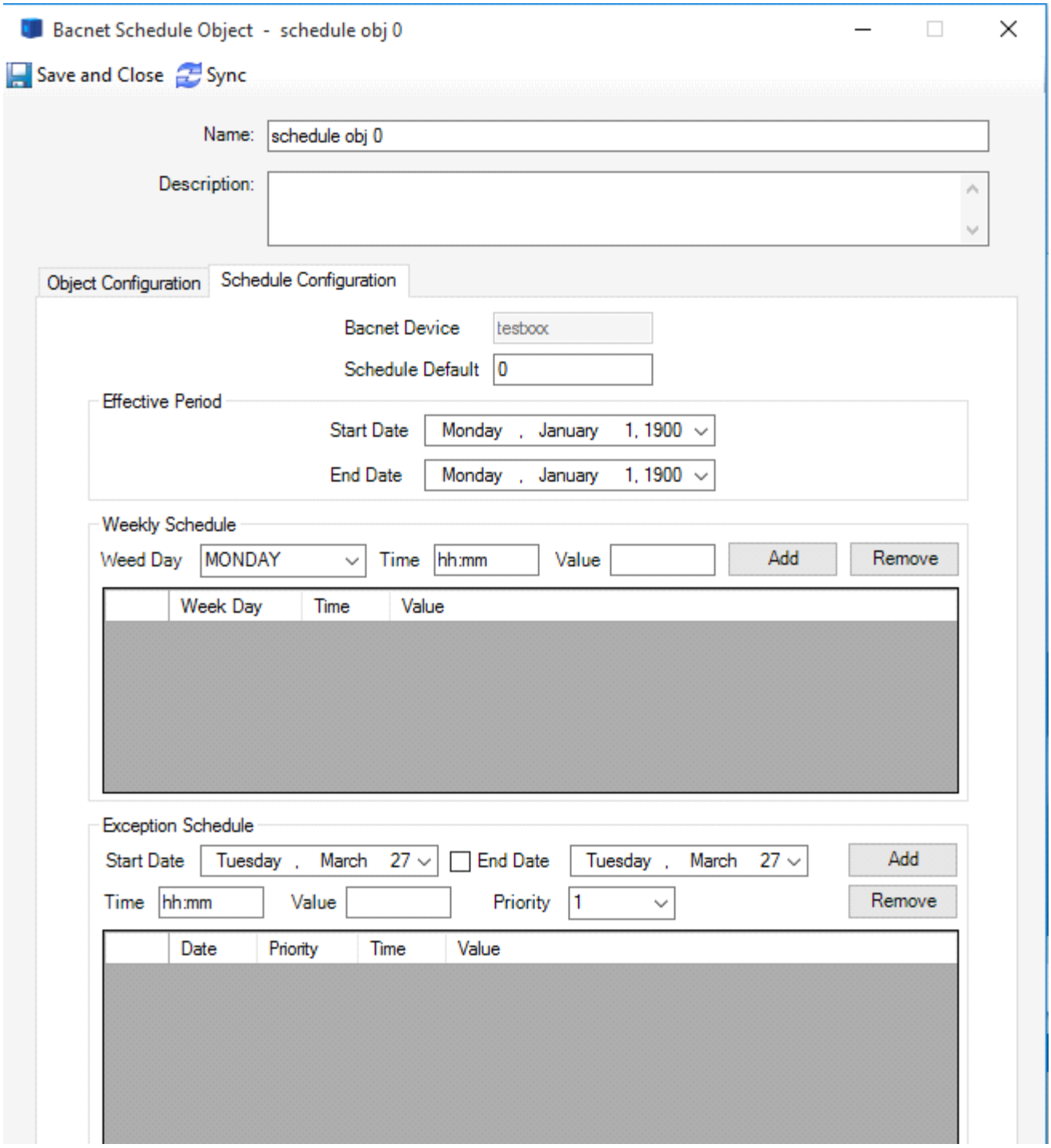


Table 13: BACnet Schedule Configurations Tab Definitions

Field	Description
Name	Schedule Name is imported from BACnet Device, user can update the Name with up to 50 characters and Name cannot be duplicated with the existing one.
Description	Enter a general comment about the BACnet Device that will help you identify the device. This text is for information only.

Table 13: BACnet Schedule Configurations Tab Definitions

Field	Description
Effective Period	This property specifies the range of dates when the Schedule Object is active.
Weekly Schedule	This field corresponds to the days Monday – Sunday. Each day consists of a list of BACnet Time and Value pairs, which describe the sequence of schedule actions on one day of the week when no Exception Schedule is in effect. The value must be comply with the object type in object property reference.
Exception Schedule	This field describes a sequence of schedule actions that takes precedence over the normal day's behavior on a specific day or days. The value must be comply with the object type in object property reference.
Sync button 	Click the sync button: the Schedule configuration via victor synchronizes to BACnet Device. Note: If you click save button, not sync button, the schedule date will only be saved to victor database.

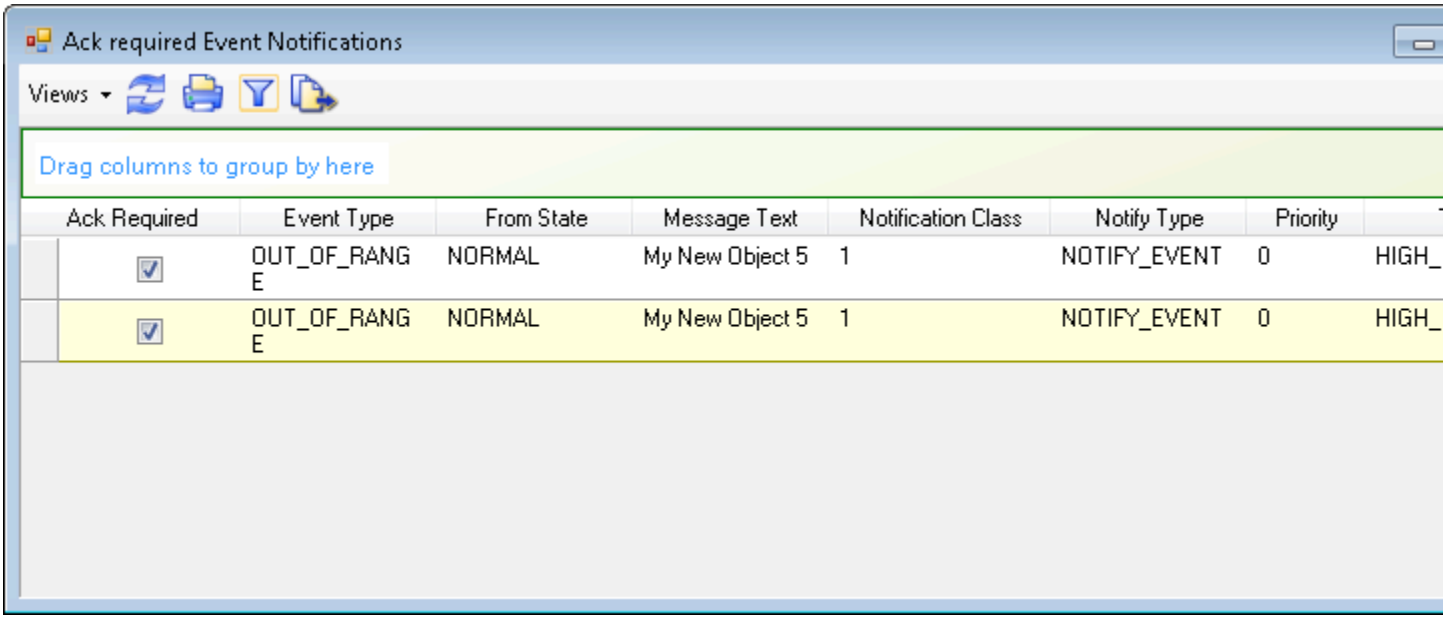
Acknowledge Ack required Event Notification

If BACnet objects use Event Notification mechanism to update data, and the subscribed Event Notification Class Required Acknowledgment, BMS integration can acknowledge Ack required event notifications from real BACnet device.

Accessing the Ack required Event Notification List

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. To open the Ack required Event Notification window, right-click the BACnet Devices folder, and select **Ack required** from the context menu.

What to do next:



Acknowledging Ack required Event Notification

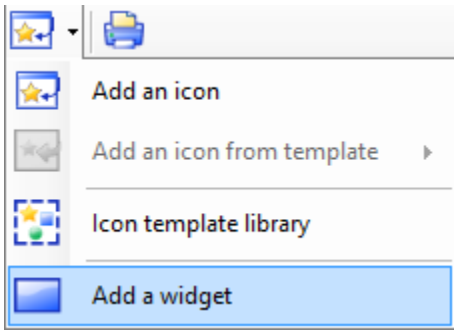
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. To open the Ack required Event Notification window, right-click the BACnet Devices folder, and select **Ack required** from the context menu.
3. Right click the desired Ack required event notification record, select **Acknowledgment** from the context menu. A confirmation message box is displayed.
4. Click **Yes** to acknowledge. After that, the selected record removed from the list.

Widgets

The integration supports Fan, Boiler, Chiller, Cooler, Damper, Heater, Humidifier, Meter, Motor, Bargraph, Bulb Light, Green Pilot Light, Red Pilot Light, Yellow Pilot Light, Pump, Push Button, Sensor Controller, Sensor Display, Slider, Switch, Tank, Label, Multiple State, Text, Valve widgets.

After you install the BMS integration, on map editor, there is an additional menu item on the  dropdown list.

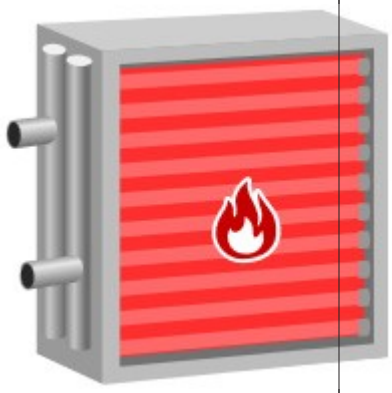
Figure 21: Add a widget menu



You can associate a C•CURE 9000 object with a widget, then the widget is able to display the real-time value, different animations for different state, additional alarm/fault/disable markup for alarm/fault/disable state.

Alarm markup is  , Fault markup is  , Disable markup is  . The priority of these state is Disable > Alarm >Fault.

Table 14: Widget Descriptions

Name	Description	Properties	Options	Animation
Heater	The widget reflects heating output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Heater is off.  Heater is on, and the red frame size will adjust according to the heating output.

Name	Description	Properties	Options	Animation
Cooler	The widget reflects cooling output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Cooler is off. Cooler is on, and the blue snowflake size will adjust according to the cooling output. 

Name	Description	Properties	Options	Animation
Boiler	The widget reflects boiler output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Boiler is off. Boiler is on and the red flame size will adjust according to the boiler output. 
Chiller	The widget reflects chiller output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Chiller is off.  Chiller is on.
Humidifier	The widget reflects humidifier output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Humidifier is off. Humidifier is on. 

Name	Description	Properties	Options	Animation
Fan	The widget reflects fan output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Rotation: 0~360 Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Fan is off.  When fan output is higher than 0, the fan leaf will go round. T he speed will adjust according to the fan output.
Pump	The widget reflects pump output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Rotation: 0~360 Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Pump is off.  When pump output is higher than 0, the pump leaf will go round. The speed will adjust according to the pump output.

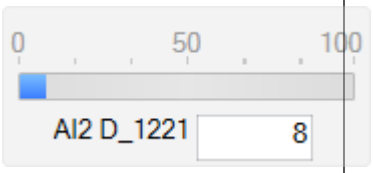
Name	Description	Properties	Options	Animation
Damper	The widget reflects damper output percent (0~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Damper is off.  When damper output is higher than 0, the grid of damper will sway. The speed will adjust according to the damper output.
Valve	The widget reflects valve position range of 0~100%.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Rotation: 0~360 Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	 Valve is closed. When valve output is higher than 0, the valve will open. The valve position will adjust according to the valve output 

Name	Description	Properties	Options	Animation
Motor	The widget reflects motor on/off state, and provides motor speed value, e.g. 1,800 rpm.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	Motor is off.   Motor is on.
Tank	The widget reflects how many percent have been filled in tank (1~100%).	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Large Change: the value to be changed when presses the PAGE UP or PAGE DOWN key or clicks the track bar. Default value is 1. Maximum Valve:100 Minimum Value: 0 Show Present Value: True or False. True means to display the present value in view mode. Default value is false. Small Change: the value to be changed when presses arrow key. Default value is 0.1.	Tank is off.  Tank is on and the scale will adjust according to the tank output 

Name	Description	Properties	Options	Animation
Meter	The widget displays an analog value.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Valve:180 Minimum Value: 0 Show Present Value: True or False. True means to display the present value in view mode. Default value is false.	
Sensor Controller	The widget displays the sensor analog value together with its unit. E.g. 72.9°F.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Valve:100 Minimum Value: 0 Step Value: the increase or decrease step value. Default value is 1. Unit: the unit of value	 Click up arrow button to increase sensor value by one step, click down arrow button to decrease sensor value by one step.
Sensor Display	The widget displays the sensor analog value together with its unit. E.g. 72.9°F.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Valve:100 Minimum Value: 0 Step Value: 1 Unit: the unit of value	

Name	Description	Properties	Options	Animation
Switch	The widget reflects on/off state of binary input/value. Click this widget is change the binary input/value status.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	Switch is off.   Switch is on.
BulbLight	The widget reflects on/off state of binary input/value. Click this widget is change the binary input/value status.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Rotation: 0~360	Bulb is off.  Bulb is on. 

Name	Description	Properties	Options	Animation
Polit Light	The widget reflects on/off state of binary output/ value.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	 Polit light is off.
				 Green polit light is on.
				 Yellow polit light is on.
				 Red polit light is on.
Push Button	The widget reflects on/off state of binary input/value. Click this widget is change the binary input/value status.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	 Push button is off.
				 Push button is on.

Name	Description	Properties	Options	Animation
Bargraph	The widget displays an analog value together with Name. The user can change the value in text box.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Valve:100 Minimum Value: 0 Unit: the unit of value The unit/maximum/ minimum is configurable.	
Slider	The widget displays an analog value. The user can change the value by slider or input the value in text box directly.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Large Change: the value to be changed when presses the PAGE UP or PAGE DOWN key or clicks the track bar. Default value is 1. Maximum Valve: 100 Minimum Value: 0 Small Change: the value to be changed when presses arrow key. Default value is 0.1. Unit: the unit of value The minimum/ maximum is configurable.	

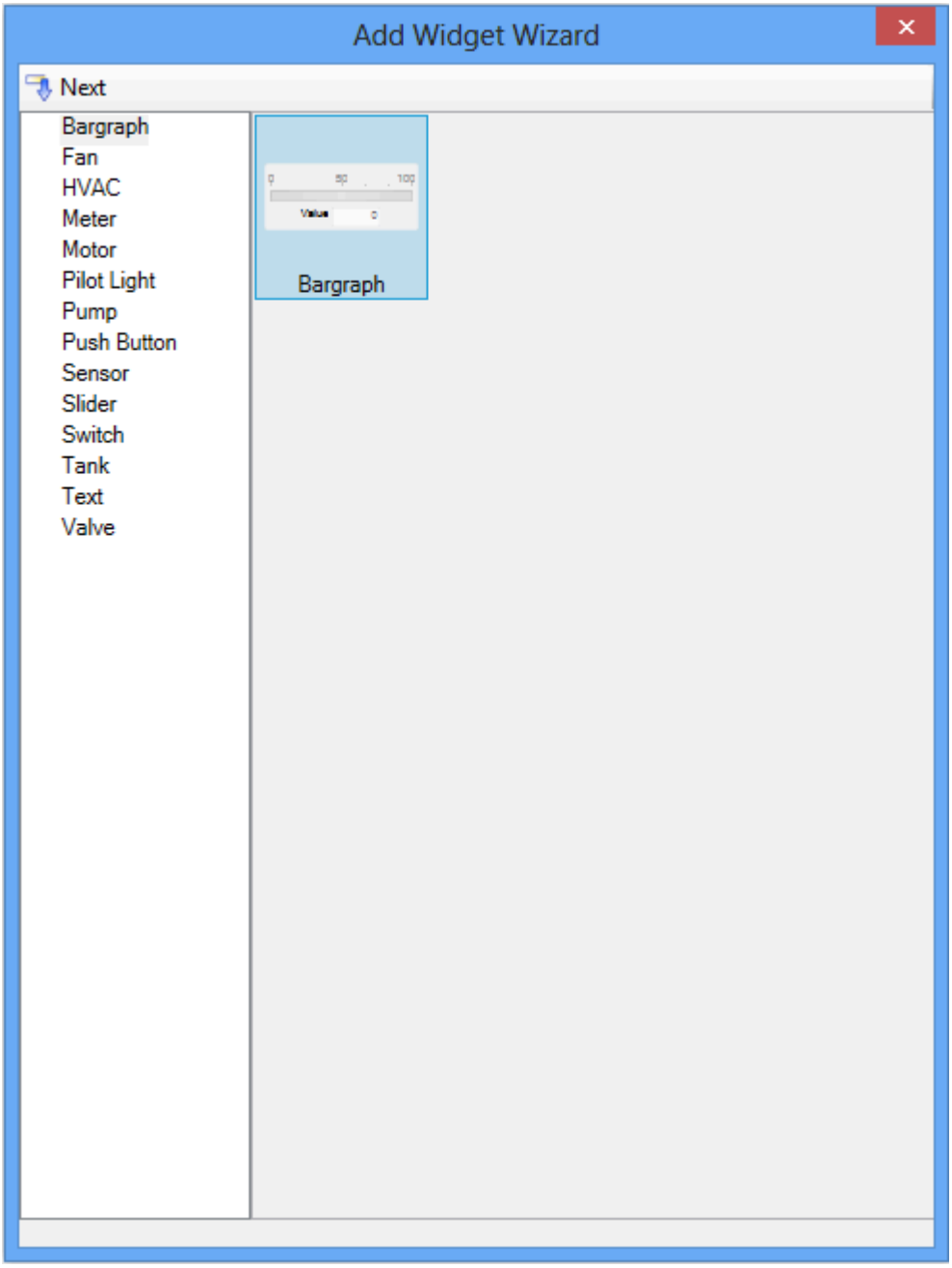
Name	Description	Properties	Options	Animation
Label	The widget displays a read-only analog value together with Name.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Unit: the unit of value The unit/name is configurable.	AI_2 D_1221 : 8
MultipleState	The widget displays a read-only multistate value together with name. The name is configurable.	Alarm Status Enabled Fault Status Object Name Present Value Number of States	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide State Text: split with ",".	MI_2 D_1221 : off

Name	Description	Properties	Options	Animation
Text	The widget displays an analog value together with Unit or Name. The user can change the value in text box.	Alarm Status Enabled Fault Status Object Name Present Value	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Valve: 100 Minimum Value: 0 Unit: the unit of value The unit/name/maximum/minimum is configurable.	AI_2 D_1221 8

Adding a Widget on Map

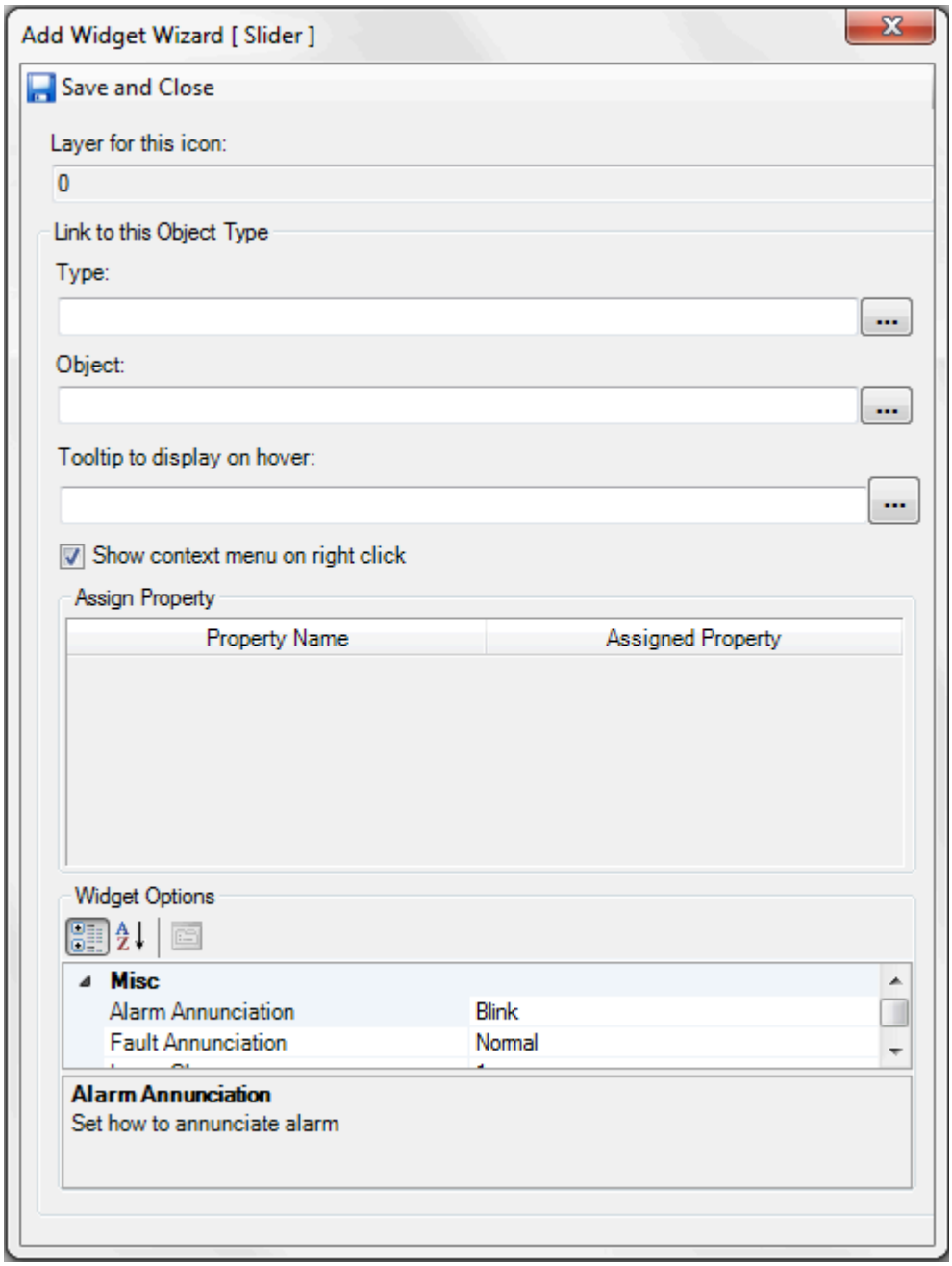
1. On a map editor, click the arrow on  . The context menu for the button appears.
2. Select Add a Widget menu, open Add a Widget Wizard window.

Figure 22: Add Widget Wizard - Widget List



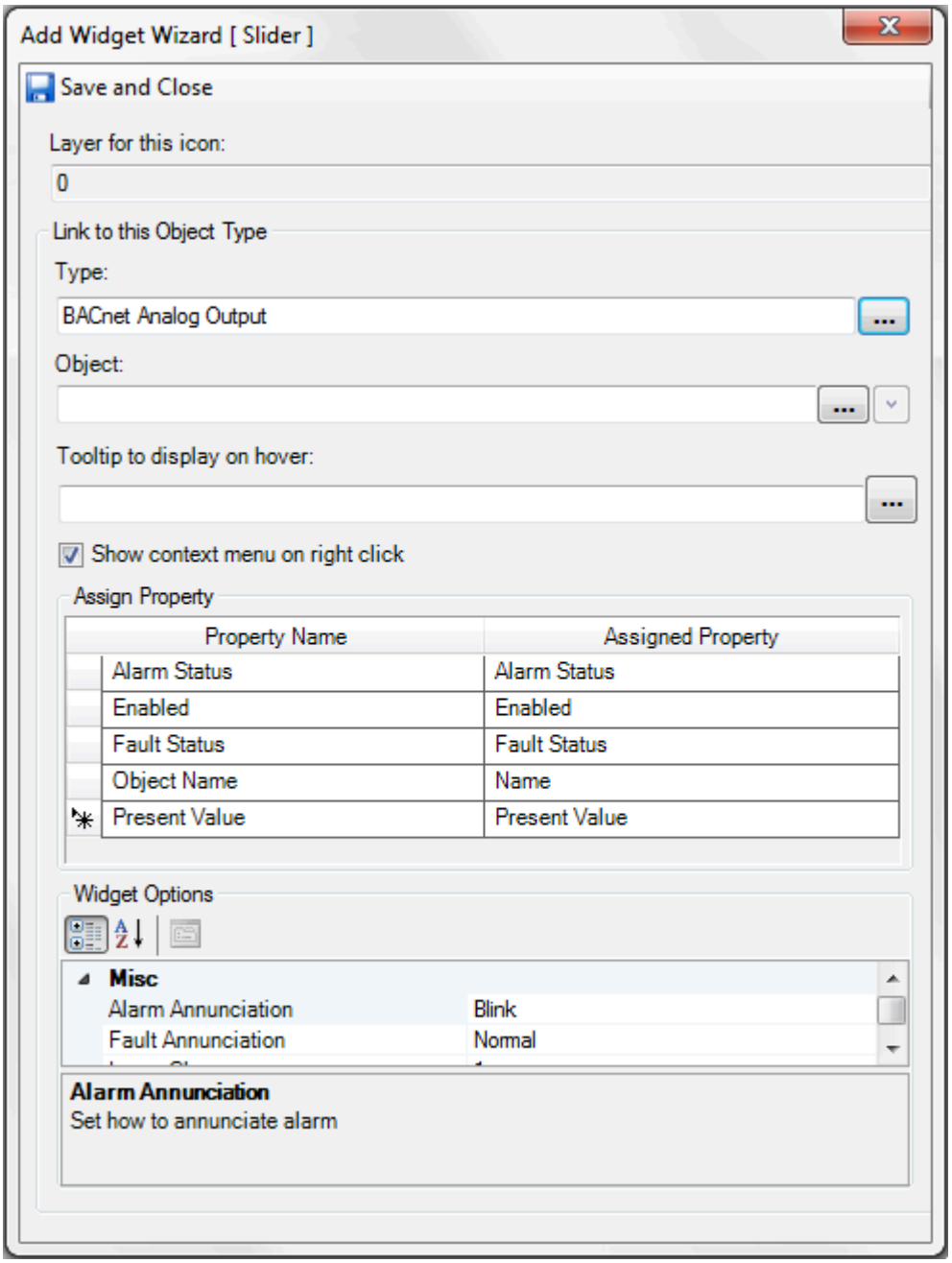
3. Select one Widget type from the list on the left, the available widgets will list on the right. All widgets can be binding to input/value object. The widget is recommended to bind to output object if it can be operated, such as Sensor Controller, Switch, Tank, BulbLight, PushButton, Bargraph, Slider, Text.
4. Select the desired widget, click **Next**. The widget configuration form opens, and the wizard title includes the widget name.

Figure 23: Widget Configuration Form



5. Click ... in the **Type** field to open a **Select Type** dialog box that allows you to select a BACnet object type linking to this widget. Click the BACnet object type you want to link to this widget.
   After a BACnet object type is selected, the system will assign properties automatically if the widget's property name equals object's property name. If name doesn't match, the corresponding Assigned Property is empty, and then manual assignment is needed. Click the cell, select desired property from drop-down list.
   Every widget supports Alarm Status, Enabled, Fault Status, Object Name, Present Value properties.

Figure 24: Widget Configuration - Assign Property



6. Click ... in the **Object** field to open a dialog box that allow you to select an object of the type you just selected. Click the object you want to choose for this widget.
7. **Optional:** To display a tooltip message about the widget, type a tooltip in the **Tooltip to Display on Hover** field.
8. To configure the widget options, see Widgets.
9. Click **Save and Close**. This widget is added into map with red frame.
10. Adjust the widget's position in the map by drag and drop.
11. Adjust the widget's size by mouse wheel.

12. To save this widget, right-click the widget and select **Save Widget** from context menu.
13. When completed map configuration, click **Save and Close** to save this map.

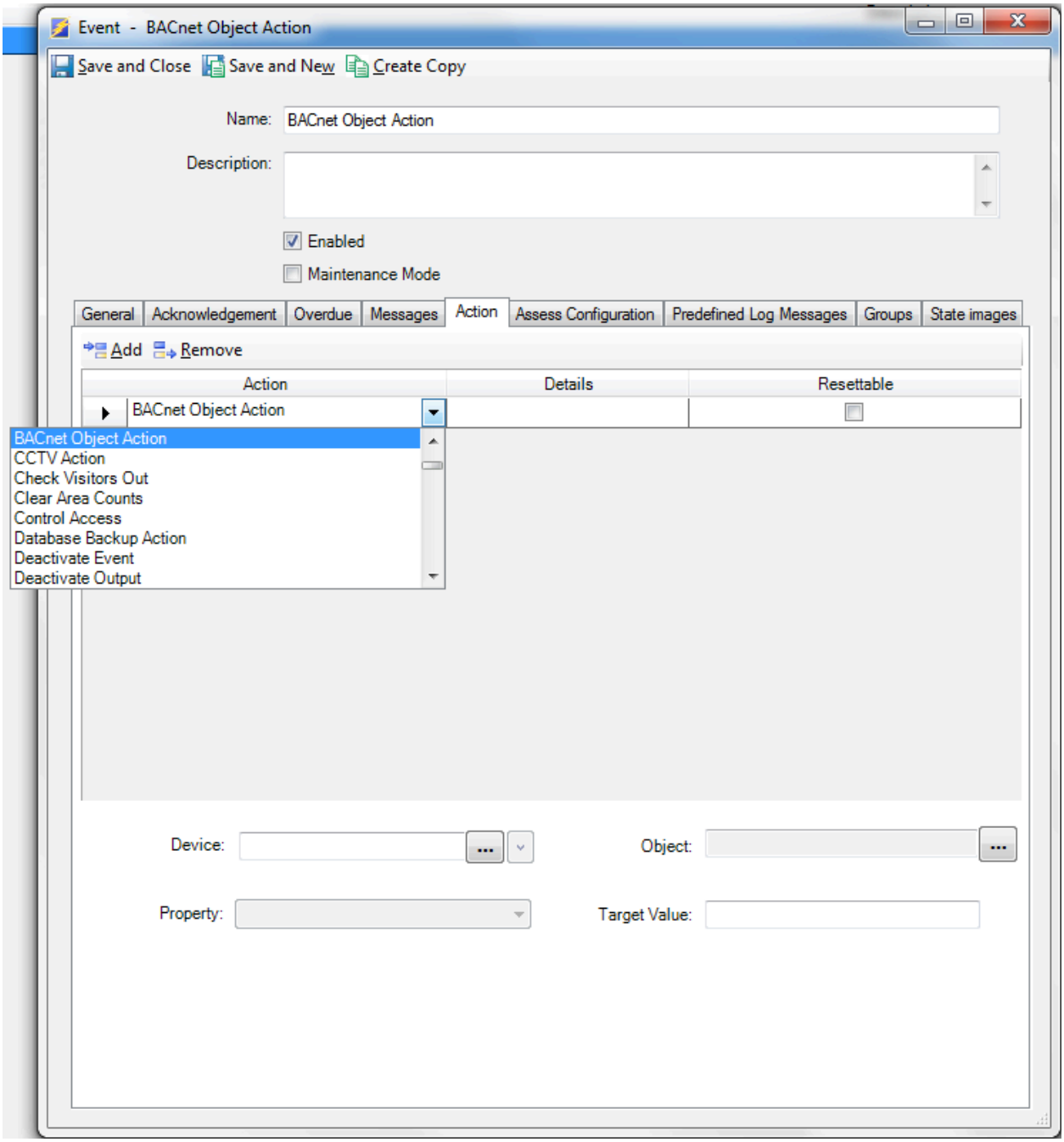
Editing a Widget on Map

1. Open an existing map, click  . The cursor becomes a cross-hair.
2. Right-click the widget and choose **Edit Widget** from the context menu to configure widget.
3. Edit the widget as required.
4. Click **Save and Close**. This widget is added into map with red frame.
5. Adjust the widget's position in the map by drag and drop.
6. Adjust the widget's size by mouse wheel.
7. To save this widget, right-click the widget and select **Save Widget** from context menu.
8. When completed map configuration, click **Save and Close** to save this map.

BACnet Event Action

The BMS Integration supports a BACnet Object action that affects a BACnet object in a BACnet device. A BACnet Object Action is audited when created or deleted.

Figure 25: BACnet Specific Actions List



The following table provides the action and its target object respectively.

Table 15: Actions and Target object

Action	Target Object	Explanation
BACnet Object Action	BACnet Object	The BACnet object action will change the selected BACnet object's present value to the configured value.

BACnet Object Action Definition

When you select BACnet Object Action in the Action drop-down list, the related field and pane appears.

Figure 26: BACnet Object Action

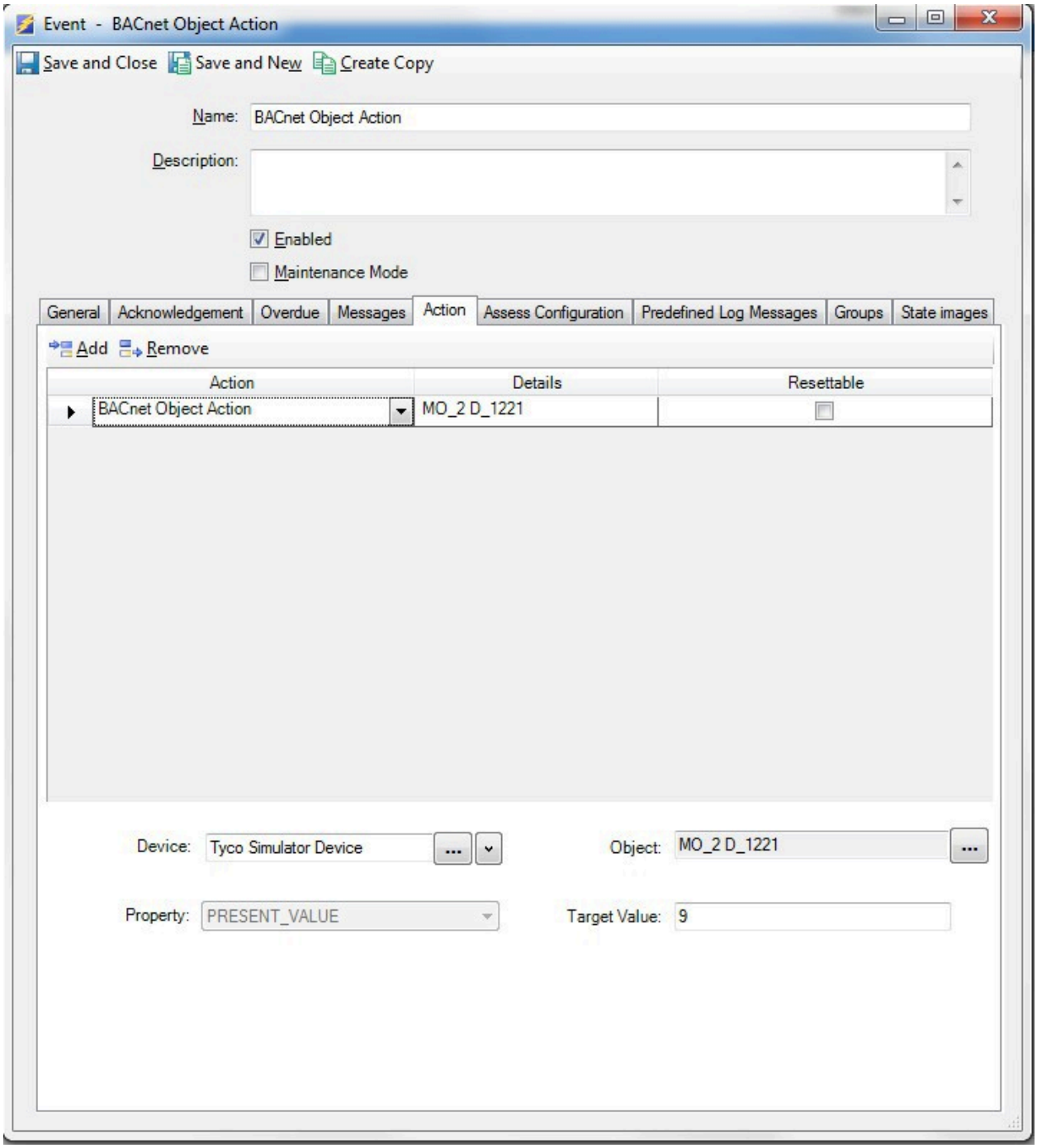


Table 16: Action Tab-BACnet Object Action Definitions

Field	Description
Device	Click ... to open the Device list. Select a BACnet device that the target object of this action belongs to.
Object	Click ... to open the Object list. It will list all BACnet objects available on the selected BACnet device. Select a BACnet object as the target object of this action.
Property	Only support present value now.
Target Value	Set the target value that this action will change to. For Binary Input/Output/Value object, the valid target value is Binary_Active, Binary_Inactive, Binary_Null. You can select desired target value from dropdown list. For Analog Input/Output/Value, Multistate Input/Output/Value, you can enter number directly on textbox.

Configuring BACnet Object Action

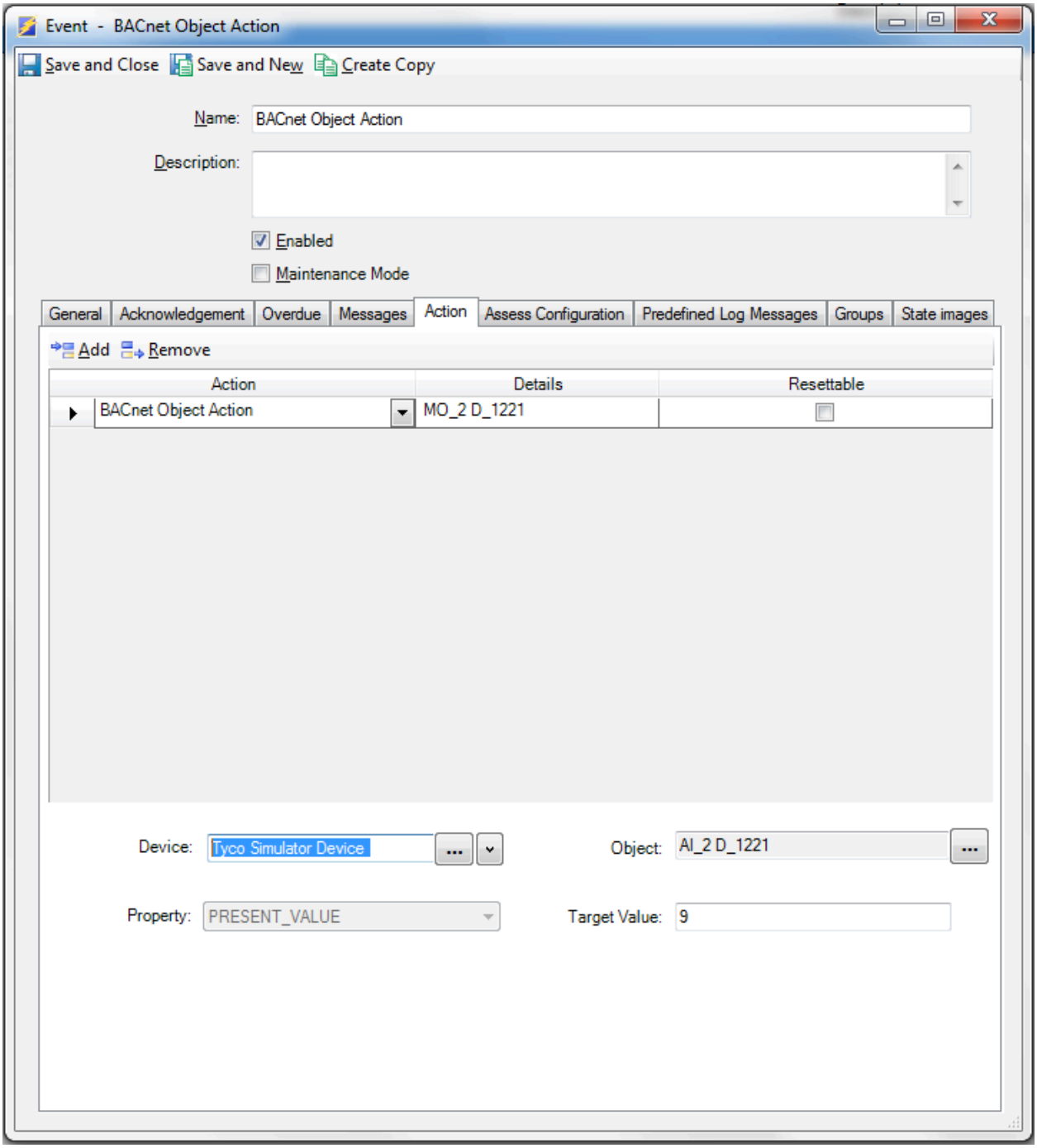
1. Create an Event named **Change AI Value**. For information about creating an event, refer to the *C•CURE 900 Software Configuration Guide*.
2. Open this Change AI Value event, select Action tab, and then select BACnet Object Action in the Action field.

   a. In the Device field, click the ... to open the BACnet device list. In the BACnet device list, select a BACnet device that the target object of this action belongs to.
   Example: Select **Tyco Simulator Device**.

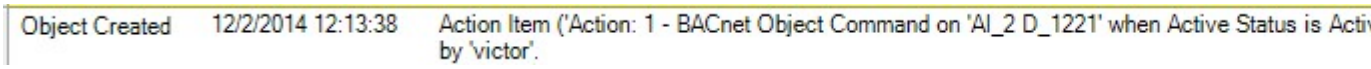
   b. In the Object field, click the ... to open the BACnet object list. In the BACnet object list, select a BACnet object as the target object of this action.
   Example: Select **AI_2 D_1221**.

   c. In the Target Value field, enter the target value for present value property.
   Example: Enter 9.

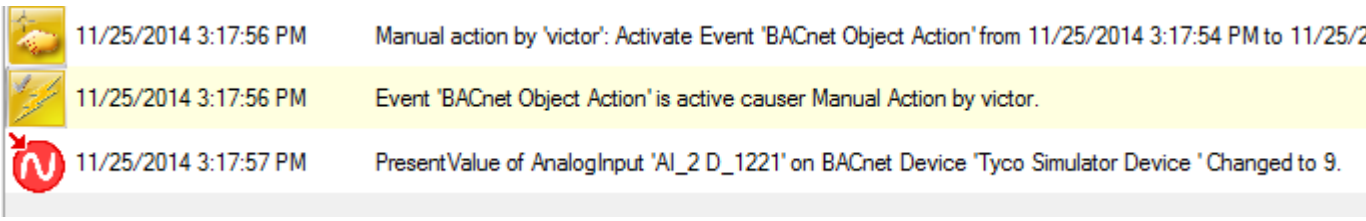
Figure 27: Action Configuration Example



3. Click **Save and Close**. The BACnet Object action is created. In the Audit Log report, you can find this audit as shown in below.



4. Activate this Event, which will change present value of AI_2 D_1221 to 9, as shown in the following Journal.



BACnet Gateway Template

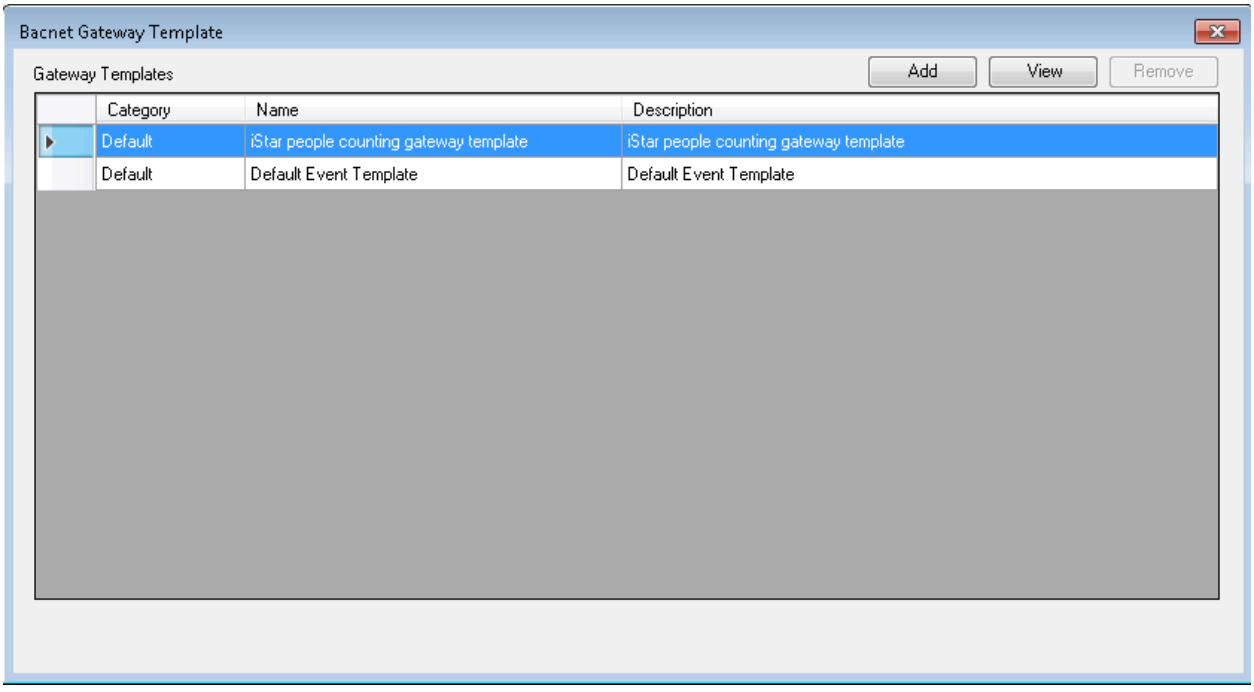
The BACnet gateway template defines the mapping definition on how to map C•CURE 9000 objects to BACnet objects. The BMS integration provides the default gateway templates and also provide the way to customize gateway template. BMS Integration provides the following default gateway templates:

- iStar people counting gateway template - this template maps the UserCountStatus property of Area to the present value of BACnet Analog Input.
- Default Event Template - this template maps the ActiveStatus of Event to present value of BACnet Binary Input.

Viewing the Available BACnet Gateway Template list

About this task:

Figure 28: BACnet gateway template



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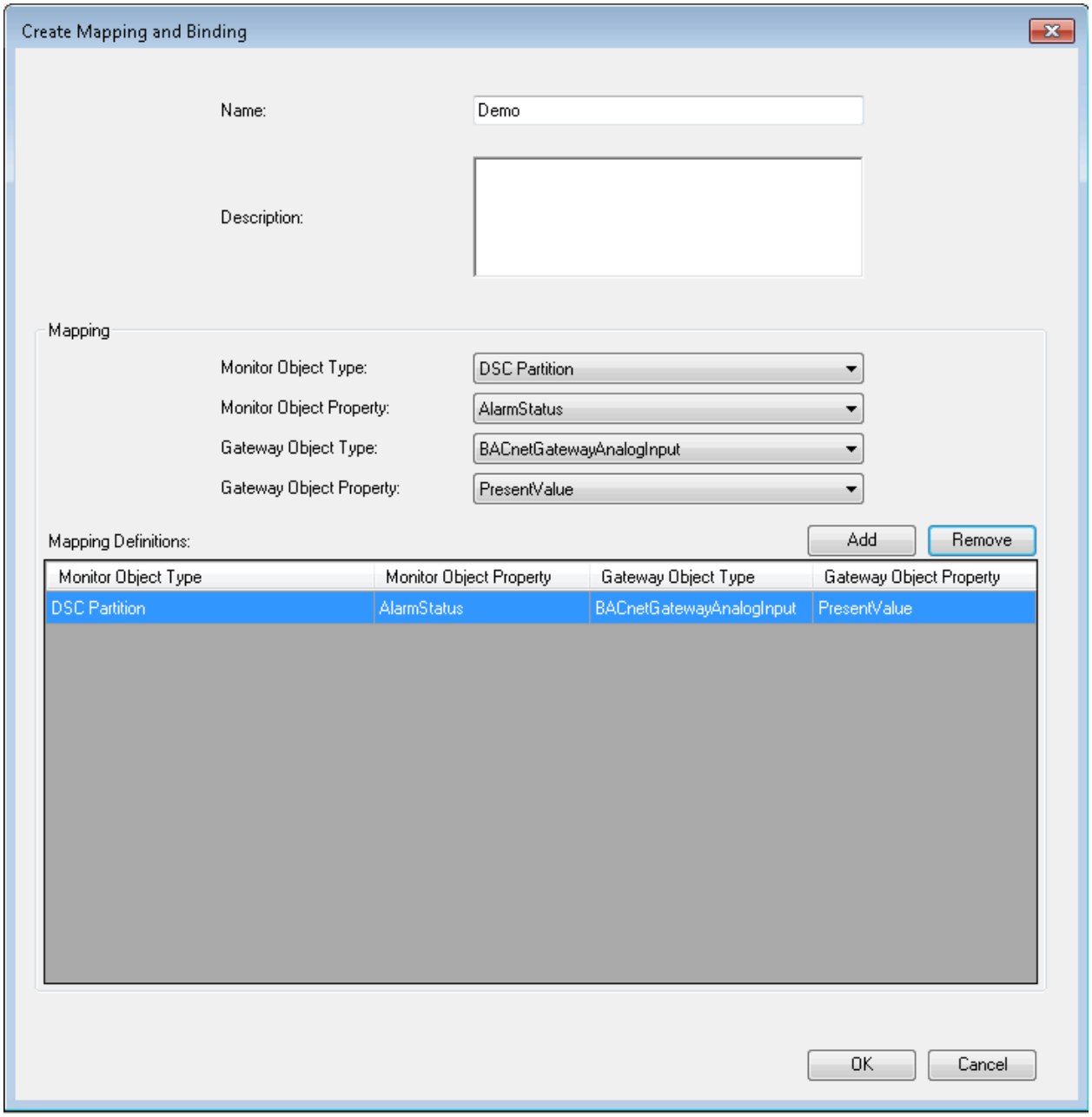
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Right-click the BACnet Gateways folder, and select **Manage Templates**.

The BACnet Gateway Template window opens. This window lists all available BACnet Gateway Templates, including default gateway templates

Viewing the Mapping Definition of the BACnet Gateway Template

About this task:

Figure 29: Create mapping and binding



1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Right-click the BACnet Gateways folder, and select **Manage Templates**.

3. From the **BACnet Gateway Template** window, select the desired template, click the **View** button to open a window that shows the mapping definition of this template.

Creating a New BACnet Gateway Template

About this task:
Perform the following steps to create a new BACnet Gateway Template.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. From the **Building Automation** pane, right-click the **BACnet Gateways** folder and select **Manage Templates**.
3. From the **BACnet Gateway Template** window, click **Add**. The **Create Mapping and Binding** window opens.
4. Type a unique name in the **Name** field.
5. Type a description for the template in the **Description** field.
6. To configure a mapping definition, complete the following steps:
   a. Select C•CURE 9000 object type from the **Monitor Object Type** drop-down list.
   b. Select the object property for the selected object type from **Monitor Object Property** drop-down list.
   c. Select the gateway object type from the **Gateway Object Type** drop-down list.
   d. Select the object property for the selected gateway object type from the **Gateway Object Property** drop-down list.
   e. Click **Add** to add the mapping definition to the **Mapping Definitions** list. **NOTE**
   You can add multiple mapping definitions to the BACnet Gateway Template.
7. **Optional:** To remove a mapping definition from the template, select a mapping definition from the **Mapping Definitions**
   list and then click the **Remove** button.
8. To save and exit, click **OK**.

Editing a BACnet Gateway Template

For the user-defined BACnet gateway template, if it has not been used yet, it can be changed if needed. Perform the following steps to edit a BACnet Gateway Template.

For the default gateway template and the template which has been used, there is no Edit button available.

Editing a BACnet Gateway Template

About this task:
To edit a BACnet Gateway Tempalte complete the following steps:

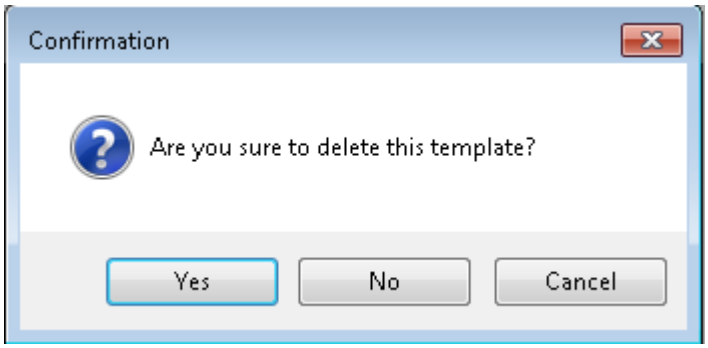
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. From the **Building Automation** pane, right-click the **BACnet Gateways** folder and select **Manage Templates**.
3. From the **BACnet Gateway Template** window, select a BACnet Gateway Template and click **Edit**. The **Create Mapping and Binding** window opens.
4. Type a unique name in the **Name** field.
5. Type a description for the template in the **Description** field.

6. To configure a mapping definition, complete the following steps:
   a. Select C•CURE 9000 object type from the **Monitor Object Type** drop-down list.
   b. Select the object property for the selected object type from **Monitor Object Property** drop-down list.
   c. Select the gateway object type from the **Gateway Object Type** drop-down list.
   d. Select the object property for the selected gateway object type from the **Gateway Object Property** drop-down list.
   e. Click **Add** to add the mapping definition to the **Mapping Definitions** list. **NOTE**
   You can add multiple mapping definitions to the BACnet Gateway Template.
7. **Optional:** To remove a mapping definition from the template, select a mapping definition from the **Mapping Definitions**
   list and then click the **Remove** button.
8. To save and exit, click **OK**.

Removing a BACnet Gateway Template

About this task:
Perform the following steps to remove a BACnet Gateway Template.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. From the **Building Automation** pane, right-click the **BACnet Gateways** folder and select **Manage Templates**.
3. From the **BACnet Gateway Template** window, select a BACnet Gateway Template and click **Remove**.
4. In the Confirmation dialog box, click **Yes**.



NOTE

For the default gateway template and the template which has been used, the remove button is grayed out.

BACnet Gateway Device Editor

BACnet Gateway Device Editor Overview

The BACnet gateway device represents the device that contains BACnet objects mapping from C•CURE 9000 objects.

Accessing the BACnet Gateway Device Editor

About this task:
Perform the following steps to access the BACnet Gateway Device editor.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. From the **Building Automation** pane, right-click the BACnet Gateways folder and select **New**. The BACnet Gateway Device Editor opens with the General tab visible.

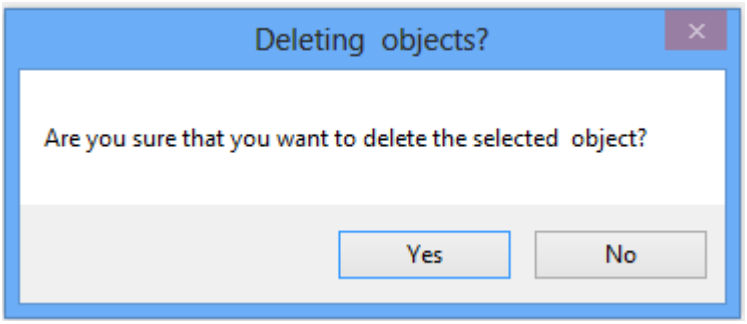
Adding a BACnet Gateway Device Object

About this task:
Perform the following steps to add a BACnet Gateway Device object.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**.
2. From the **Building Automation** pane, right-click the BACnet Gateways folder and select **New**. The BACnet Gateway Device editor opens.
3. Type a unique name in the Name field.
4. Type a textual description for the BACnet Gateway device in the Description field.
5. See BACnet Gateway Device General Tab to configure communication information. **NOTE** If the Network ID of the BACnet gateway device is 0, MAC Address is not necessary, but if Network ID is not 0, you must enter MAC Address to identify device.
6. Check the **Enabled** option to make BACnet Gateway Device work.
7. If you are done editing the BACnet gateway device, click to save the BACnet gateway device configuration.

Deleting a BACnet Gateway Device Object from the Building Automation Tree

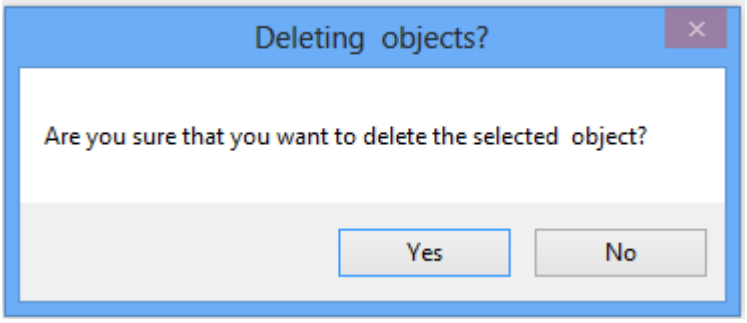
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click Building Automation. The Building Automation pane opens.
2. Expand the **BACnet Gateways** folder.



3. Right-click a BACnet gateway device object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.
4. Click **Yes**. After a while, this BACnet gateway device object and all BACnet objects in this device are deleted from Building Automation tree and C•CURE 9000 database.

Deleting a BACnet Gateway Device Object from the Dynamic View

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Select **BACnet Gateways** from Building Automation pane drop-down list.
3. Click to open a Dynamic View showing all BACnet Gateway Devices objects.

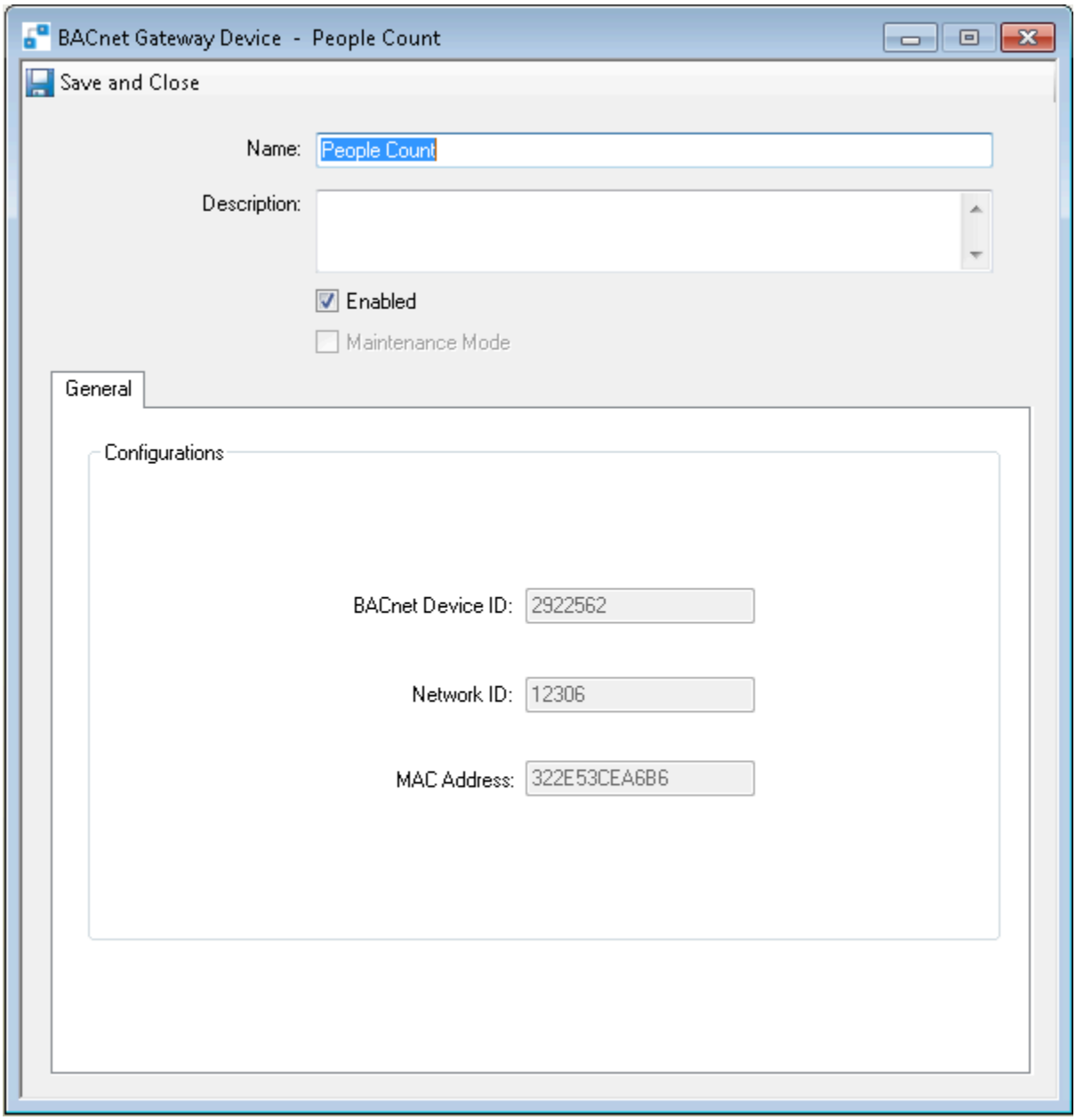


4. Right-click a BACnet gateway device object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.
5. Click **Yes**. After a while, this BACnet gateway device object and all BACnet objects in this device are deleted from Building Automation tree and C•CURE 9000 database.

BACnet Gateway Device General Tab

From the BACnet Gateway Device General tab, you can set the name and description for the BACnet Gateway device, and configure the communication settings for the device.

Figure 30: BACnet Gateway Device - General Tab



BACnet Gateway Device General Tab Definitions

The following table describes the BACnet Gateway Device General tab fields.

Table 17: BACnet Gateway Device General Tab Definitions

Field	Description
Name	Enter a unique name up to 50 characters long for BACnet Gateway Device. If you enter the name of an existing object, the system will not save the object, and will display an error message indicating there is a conflict. Choose a different name.
Description	Enter a description of the BACnet gateway device that will help you identify the device. This text is for information only.

Table 17: BACnet Gateway Device General Tab Definitions

Field	Description
Enabled	Select the Enabled option to make BACnet gateway device work on system, or clear this option to disable the BACnet gateway Device. The default value is enabled. You can change BACnet Device ID, MAC Address, Network ID when disabled BACnet gateway device.
Configuration	
BACnet Device ID	BACnet gateway device ID, which must be unique on the network. Read only.
MAC Address	MAC address of BACnet gateway device. Read only.
Network ID	Network ID of BACnet gateway device. Read only.

Configuring a BACnet Gateway Device Object

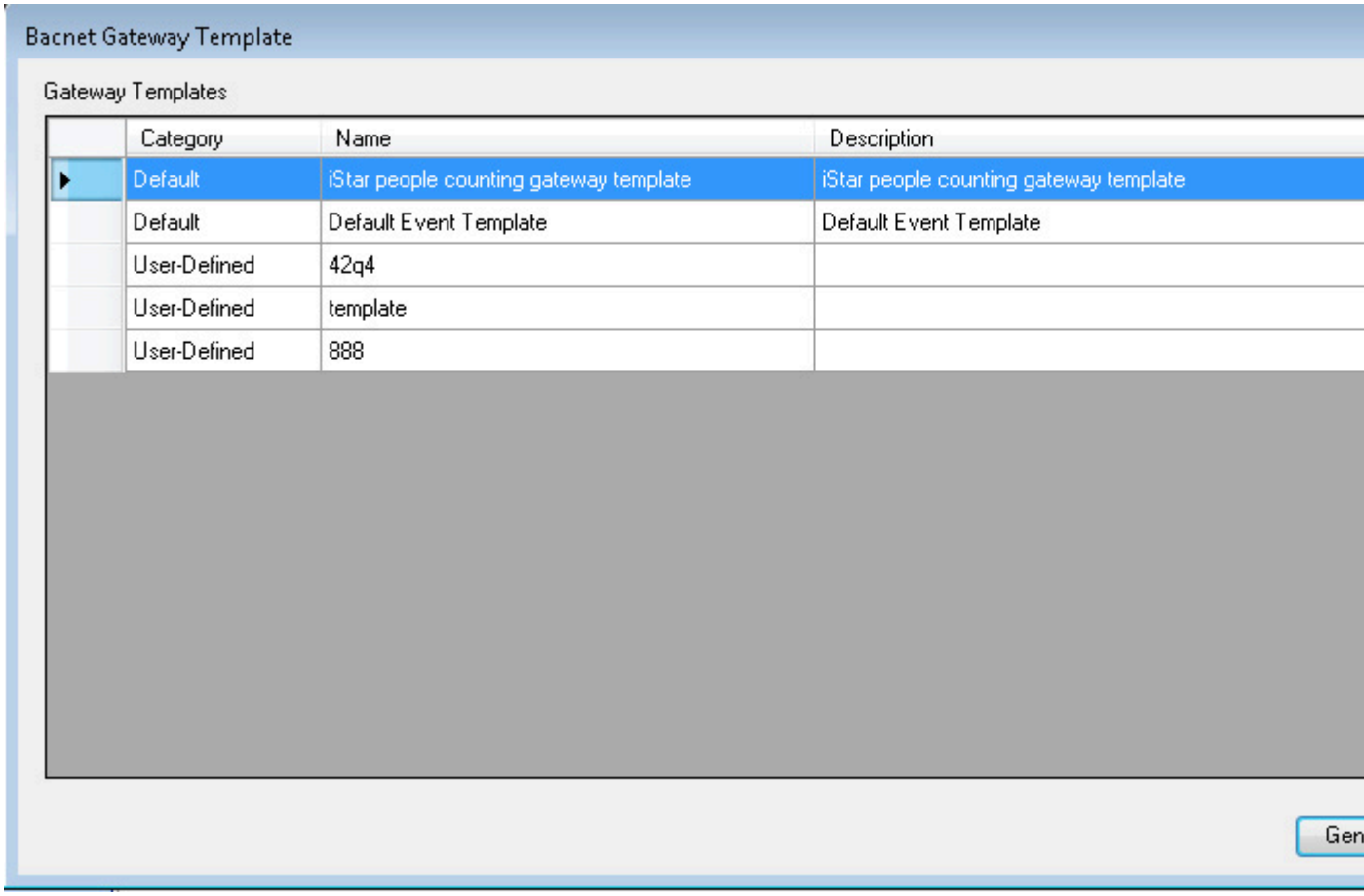
About this task:
You can use the BACnet Gateway Device Editor to configure settings for BACnet gateway device.To Configure a BACnet Device Object complete the following steps:

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateway** folder.
3. To edit the BACnet Gateway Device, select one of the following options:
   - • Double-click a BACnet gate device icon or name
   - • Right-click a BACnet gateway device and select **Edit**. The BACnet gateway device editor opens.
4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet gateway device in the **Description** field.
6. See BACnet Gateway Device General Tab to configure communication information.
7. Check the **Enabled** check box to make BACnet gateway device work.
8. If you are done editing the BACnet gateway device, click to save the BACnet gateway device configuration.

Creating Monitored Mapping for BACnet Gateway Device

About this task:
Perform the following steps to create Monitored Mapping for BACnet Gateway Device.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateways** folder.

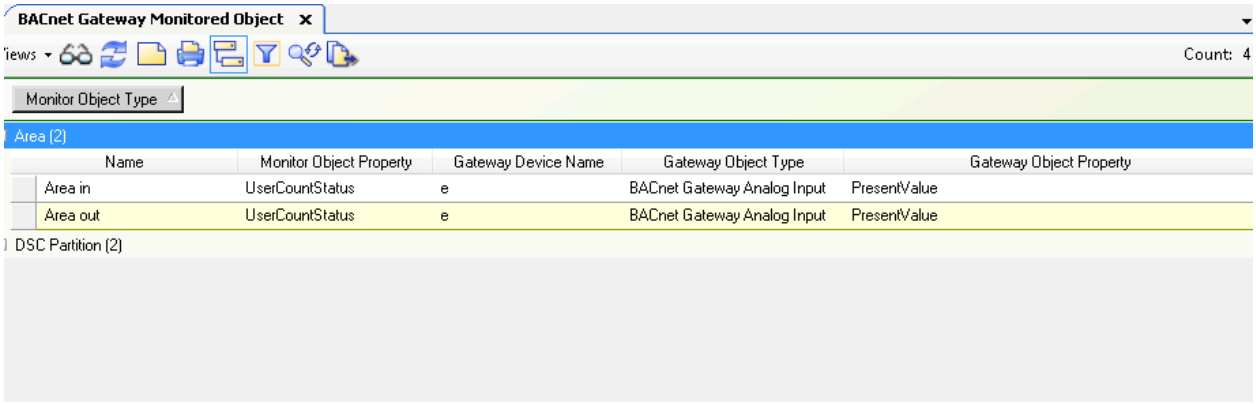


3. Right-click a BACnet Gateway device, select **Create Monitored Mapping** from context menu.
4. From the BACnet Gateway Template window, select a template and then click **Generate**.
   The Create Mapping and Binding window opens. By default, one mapping definition is selected, and the corresponding monitored instances list on the Binding Instances frame.
5. Select a Mapping Definition, then select the instances to be monitored.
6. Click **Generate** to generate BACnet gateway objects. After a while, the output summary window opens to list all BACnet gateway objects and mapping results. The BACnet Gateway Object name is created automatically, following the rule: BACnet object type+instance name+object property.

Viewing BACnet Gateway Monitored Objects

About this task:
Perform the following steps to view BACnet Gateway Monitored Objects.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. From **Building Automation** pane list, select **BACnet Gateways Monitored Objects**.
3. Click  to open a Dynamic View of all Monitored Objects that have been mapped. The BACnet gateway monitor object grouped by Monitor Object Type by default.

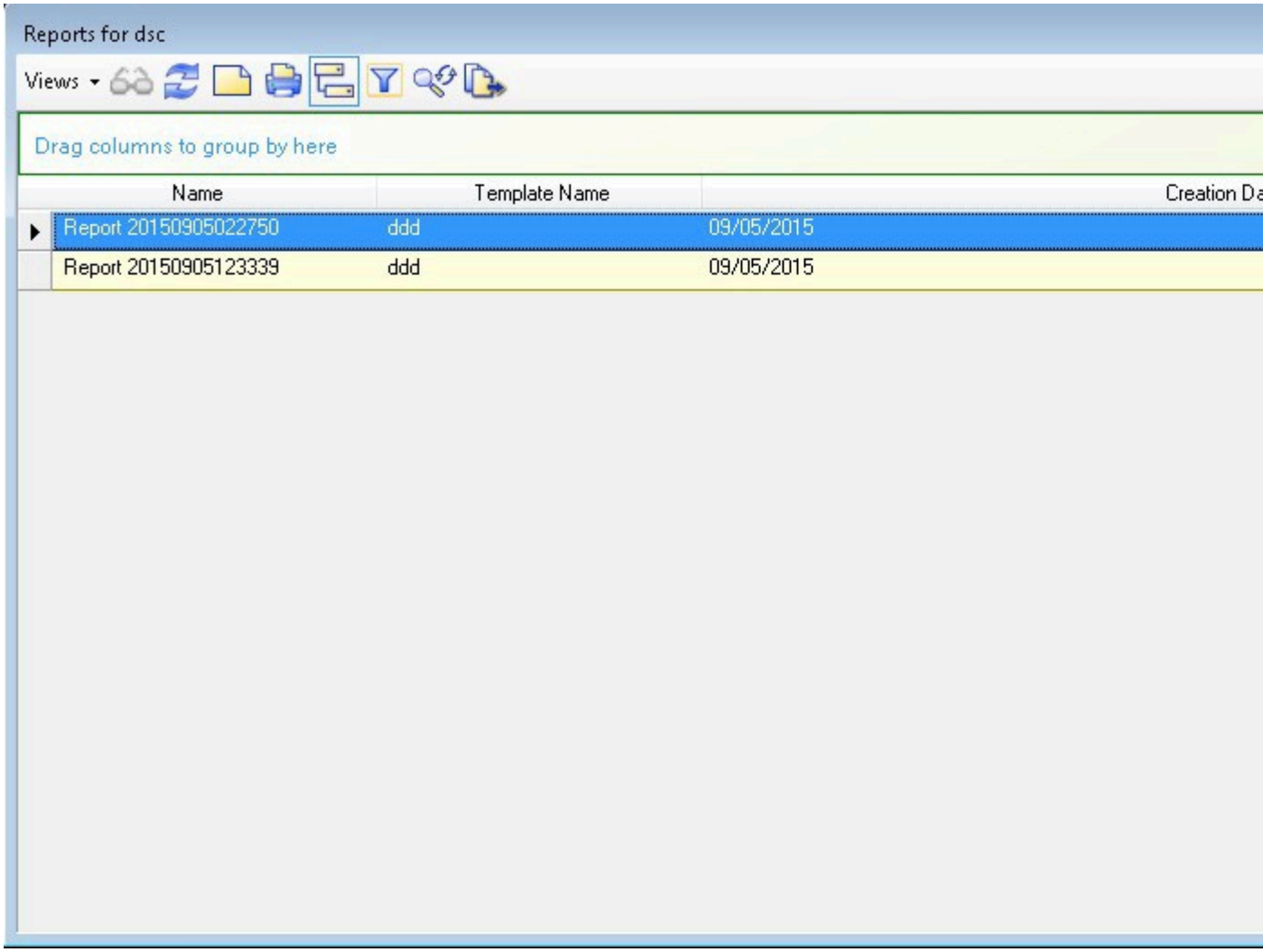


Viewing the Mapping Reports for BACnet Gateway Device

Perform the following steps to view the mapping reports for BACnet Gateway Device.

To view the mapping reports for BACnet Gateway Device

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateways** folder.
3. Right-click a BACnet Gateway device and select **View Mapping Reports**.



4. From the **Mapping Report** window, right-click a report and select **View Details**.

A window opens to display the detailed information, including Template Name, Template Definition, Mapping instances.

BACnet Gateway Object Editor

This chapter describes BACnet Gateway Object Editor. In this chapter:

BACnet Gateway Object Editor Overview

The BACnet Gateway Object represents the BACnet Gateway Object in the C•CURE 9000 database.

Accessing the BACnet Gateway Object Editor

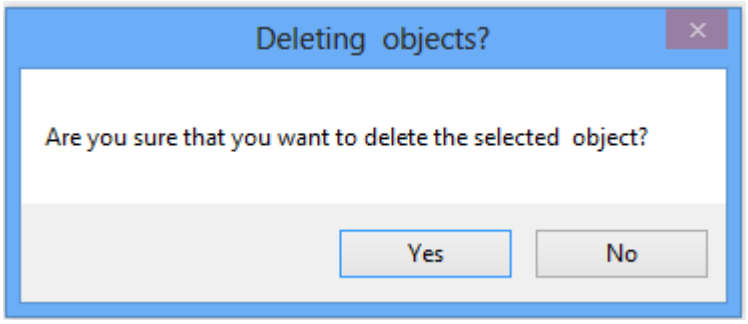
About this task:
Perform the following steps to access the BACnet Gateway Object editor.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click Building Automation. The Building Automation pane opens.
2. Expand the **BACnet Gateways** folder.
3. Expand the Analog Input/AnalogOutput/Analog Value/Binary Input/Binary Output/ Binary Value/Multistate Input/Multistate Output/Multistate Value folder.
4. To open the BACnet Gateway Object editor to edit an existing BACnet Gateway Object, double-click a BACnet Gateway Object icon or name or right-click a BACnet Gateway Object and select Edit from context menu.

The BACnet Gateway Object Editor opens with the General tab visible.

Deleting a BACnet Gateway Object from the Building Automation Tree

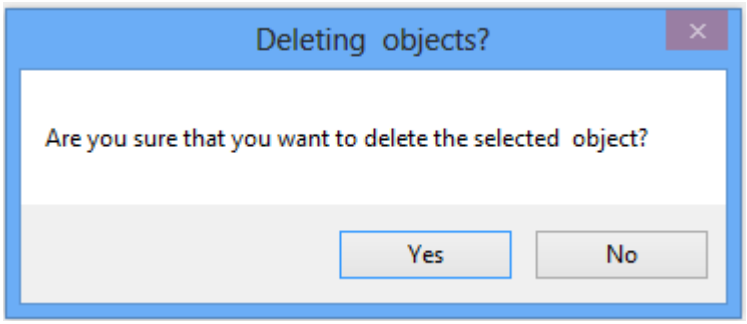
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateway Object** folder.
3. Right-click a BACnet Gateway Object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.



4. Click **Yes**. After a while, this BACnet Gateway Object is deleted from Building Automation tree and C•CURE 9000 database.

Deleting a BACnet Gateway Object from the Dynamic View

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Select **BACnet Gateway Object** from **Building Automation** pane drop-down list.
3. Click  to open a Dynamic View showing all BACnet Gateway Objects.
4. Right-click a BACnet Gateway Object to be deleted and select **Delete** from context menu. A confirmation dialog box opens.

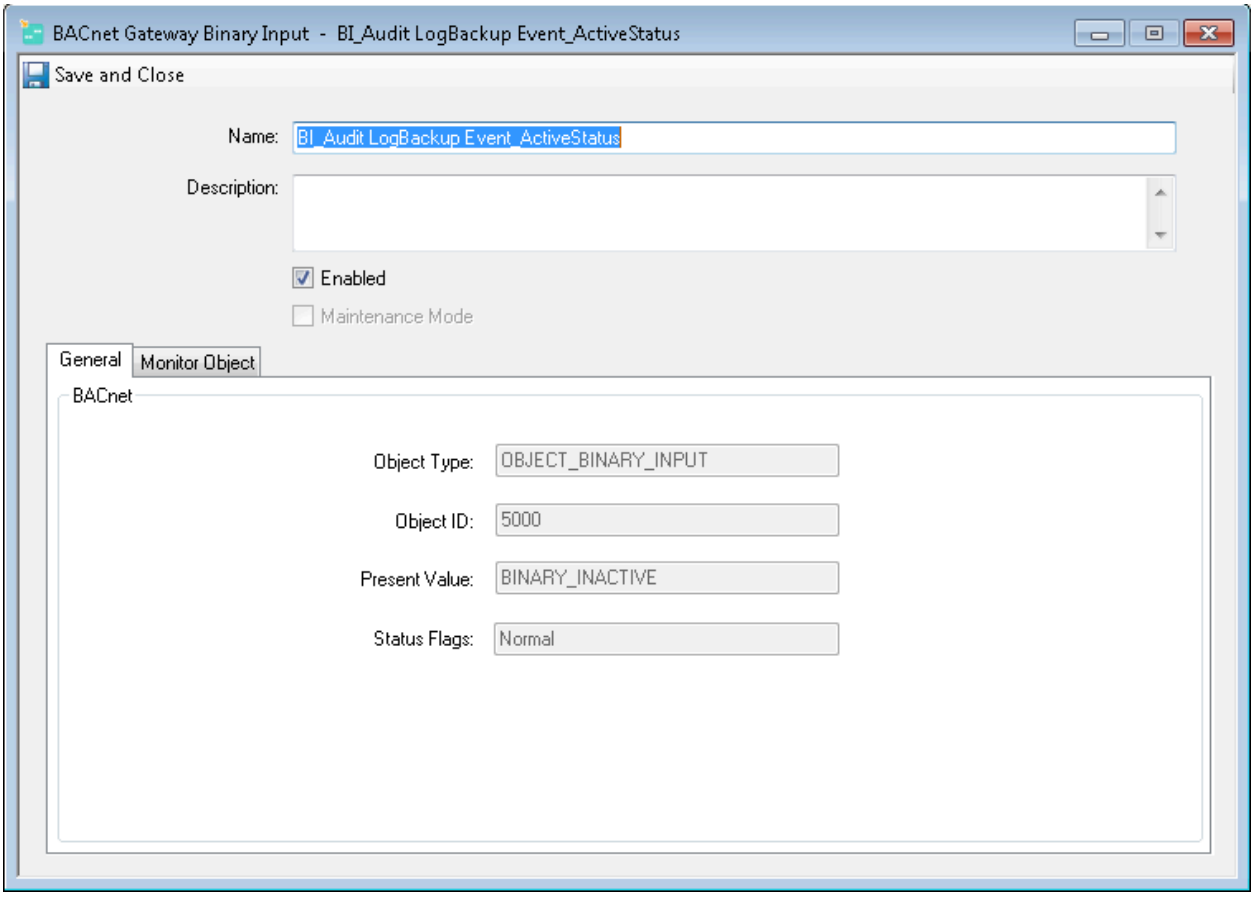


5. Click **Yes**. After a while, this BACnet Gateway Object is deleted from Building Automation tree and C•CURE 9000 database.

BACnet Gateway Object General Tab

From the BACnet Gateway Object General tab, you can set the name and description for the BACnet Gateway Object, and view present value of this object.

Figure 31: BACnet Gateway Object - General Tab



BACnet Gateway Object General Tab Definitions

The following table describes the BACnet Gateway Object General tab fields.

Table 18: BACnet Gateway Object General Tab Definitions

Field	Description
Name	Enter a unique name up to 50 characters long for BACnet Gateway Object. If you enter the name of an existing object, the system will not save the object, and will display an error message indicating there is a conflict. Choose a different name.
Description	Enter a general comment about the BACnet Gateway Object that will help you identify the device. This text is for information only.
Enabled	Click Enabled to make this object work.
Object Type	BACnet Gateway object type. Valid value: ANALOG_INPUT, ANALOG_OUTPUT, ANALOG_VALUE, BINARY_INPUT, BINARY_ OUTPUT, BINARY_VALUE, MULTI- STATE_INPUT, MULTI-STATE_OUTPUT, MULTI-STATE_VALUE. Read only.
Object ID	BACnet Gateway object ID. Read only.
Present Value	The current value of the BACnet gateway object. Read only.
Status Flags	Not Applicable in this release.

Configuring a BACnet Gateway Object

About this task:
You can use the BACnet Gateway Object Editor to configure settings for BACnet Gateway Object.

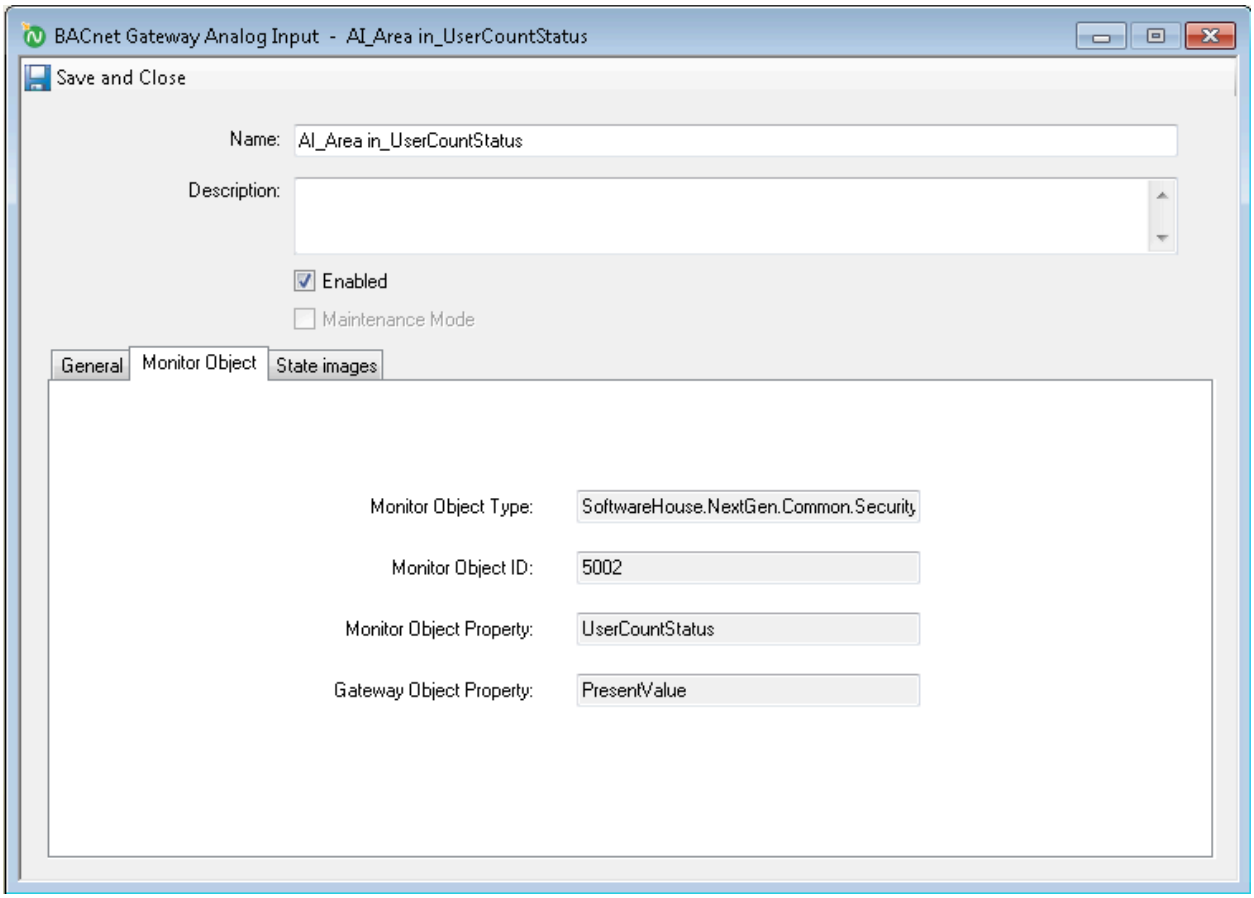
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateway Object** folder.
3. To edit a BACnet Gateway object, select one of the following options:
   - • Double-click a BACnet Gateway Object icon or name
     • Right-click a BACnet Gateway Object and select **Edit**.
4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet Gateway Object in the **Description** field.
6. Check the **Enabled** option to make this object work.
7. If you are done editing the BACnet Gateway Object, click to save the BACnet Gateway Object configuration.

Viewing Monitor Object for this BACnet Gateway Object

About this task:
Perform the following steps to view Monitor Object for this BACnet Gateway Object.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Gateway Object** folder.
3. To edit a BACnet Gateway Object, select one of the following options:
   - • Double-click a BACnet Gateway Object icon or name
     • Right-click a BACnet Gateway Object and select **Edit** from context menu.
4. Click the **Monitor Object** tab to view which monitor object is monitored by this BACnet gateway object.

Figure 32: BACnet Gateway Object - Monitor Object Tab



BACnet Broadcast Management Device

This chapter describes BACnet Broadcast Management Device. In this chapter:

BACnet/IP Broadcast Management Device Overview

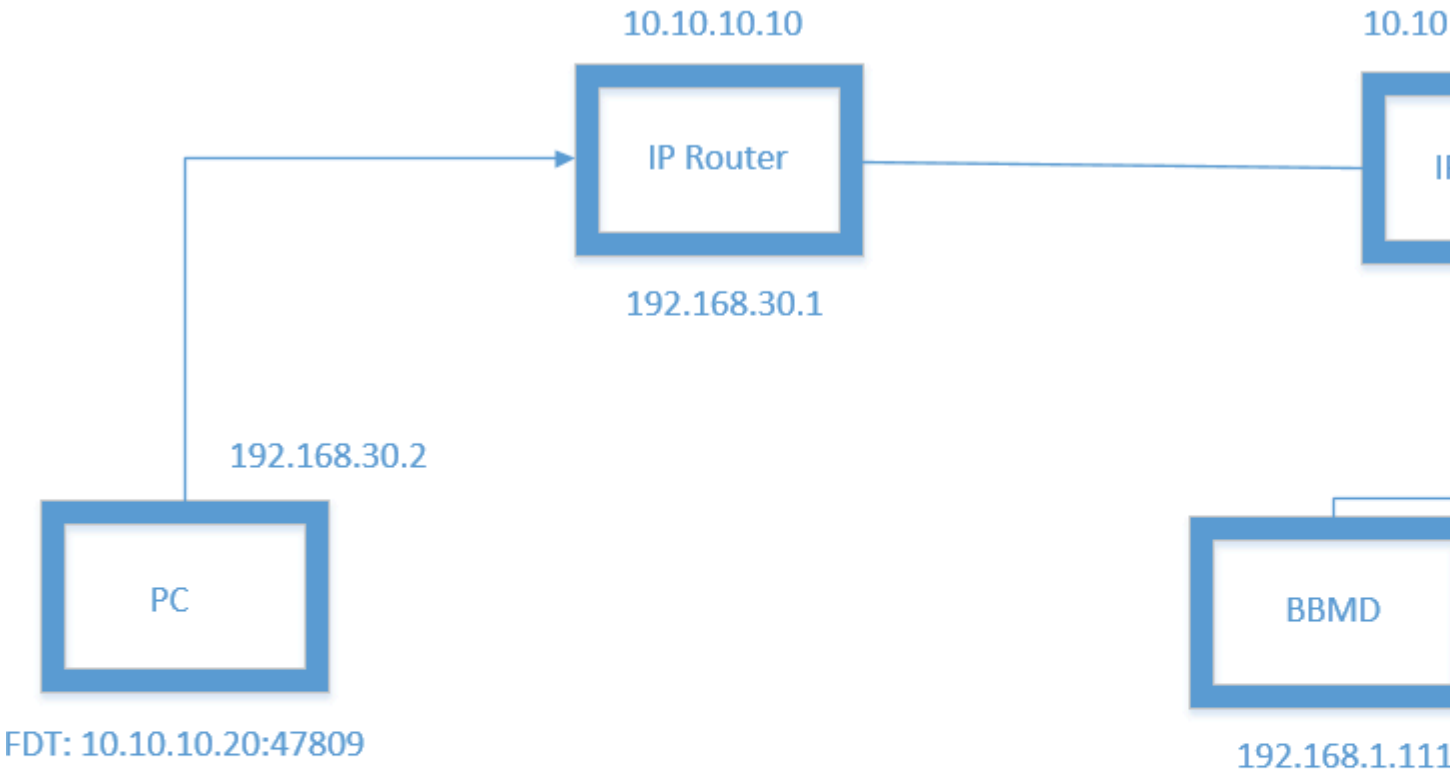
The BACnet utilized broadcast messages for certain functions, when you try to discover BACnet Devices, your BACnet Devices are interconnected via IP routers then the IP routers normally blocks the broadcast messages. This may cause issues for your BACnet communications. BACnet solves

the IP router issue by utilizing a BACnet/IP Broadcast Management Device (BBMD). The BBMD will send any received broadcast messages as directed messages through the IP router to its partner BBMD Devices.

Supported and Tested BBMD Network - First

The following image displays the Topology of first Supported and Test network of BBMD.

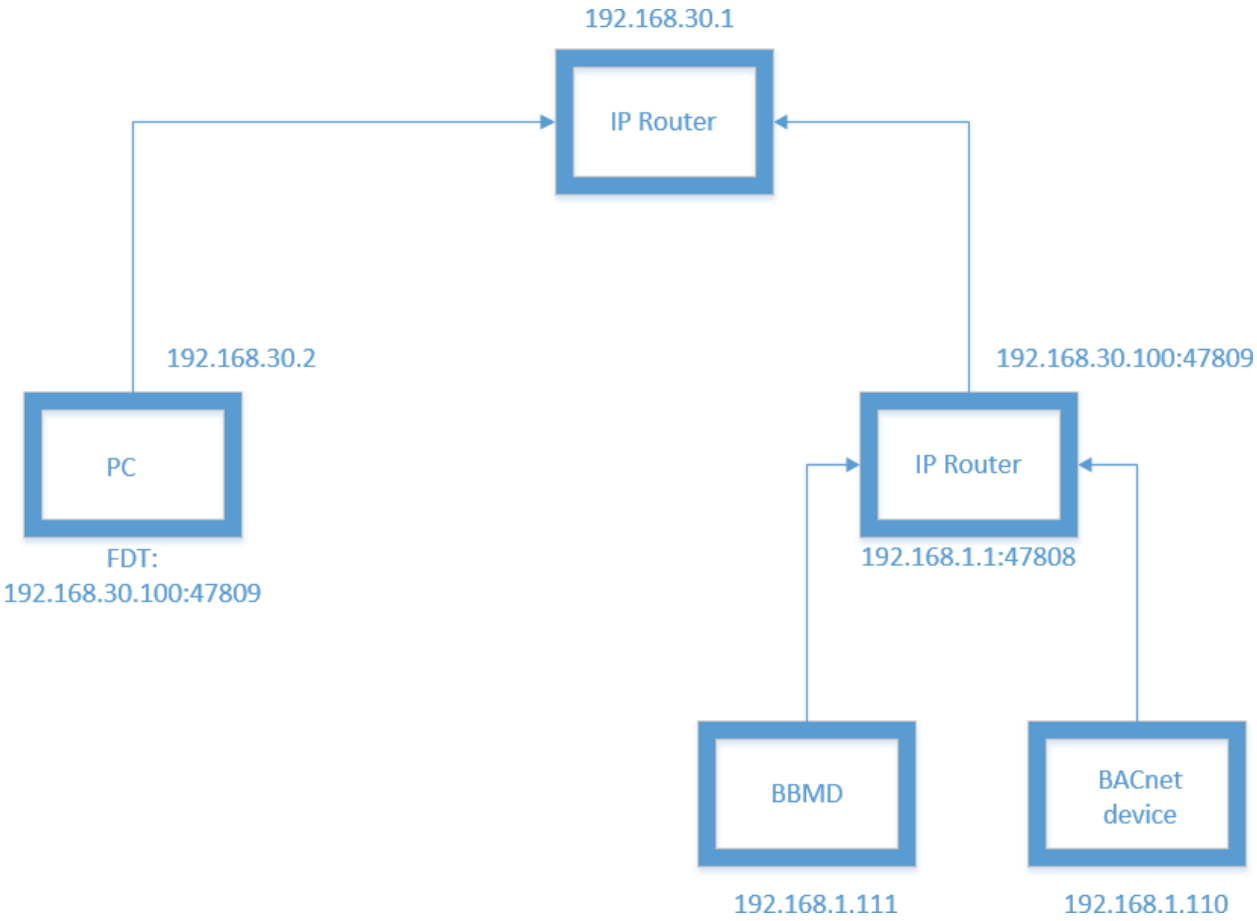
Figure 39: Supported and Test Network Topology - First



Supported and Tested BBMD Network - Second

The following image displays the Topology of second Supported and Test network of BBMD.

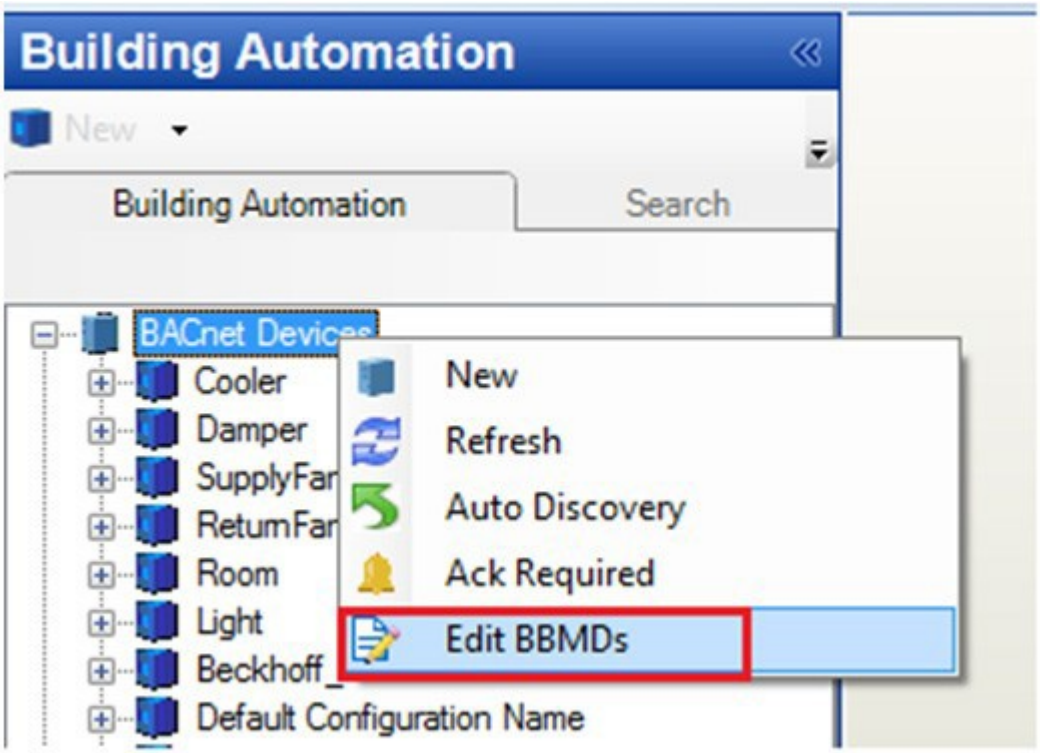
Figure 33: Supported and Test Network Topology - Second



Accessing the BACnet Broadcast Management Device (BBMD)

About this task:
Perform the following steps to access the BACnet Broadcast Management Device (BBMD).

Figure 34: BBMD

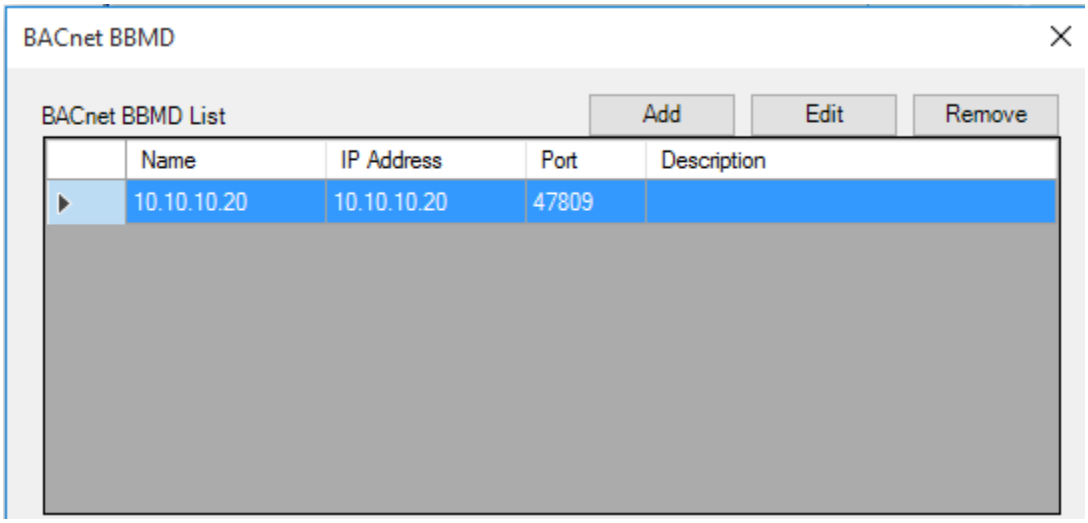


1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Expand the **BACnet Device** folder.
3. Right click the BACnet Device folder, select **Edit BBMDs**.

Adding a BBMD

About this task:
Perform the following steps to add a BBMD.

Figure 35: BBMD Editor



1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Right-click the BACnet Device folder, then select **Edit BBMDs** from context menu, the BBMD pane lists all BBMDs.
3. On the BACnet BBMD pane, click **Add**. button, the new BBMD pane opens.
4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet Device in the **Description** field.
6. To configure communication information, see BBMD General Tab.
7. Select the **Enabled** check box.
8. Click **Add**.

Editing a BBMD

About this task:
Perform the following steps to edit a BBMD.

1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.
2. Right-click the **BACnet Device** folder, and then select **Edit BBMDs** from context menu.
3. On the **BBMD** pane, click **Edit**.
4. Type a unique name in the **Name** field.
5. Type a textual description for the BACnet device in the **Description** field.
6. To configure communication information, see BBMD General Tab.
7. Select the **Enabled** check box.
8. Save the BBMD configuration.

Deleting a BBMD from the Building Automation tree

About this task:
You can delete a BBMD from the Building Automation tree if you no longer need it.

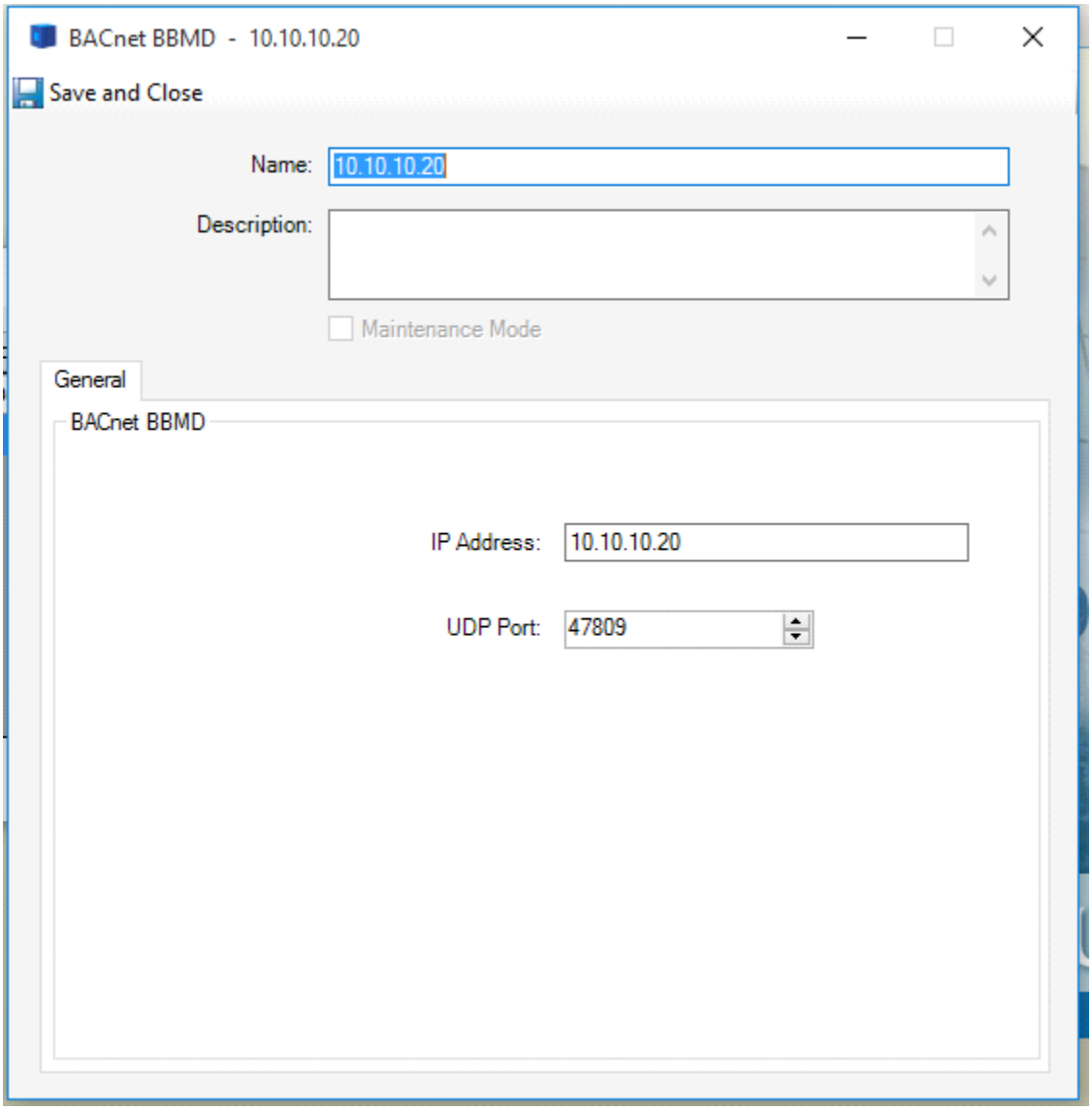
1. In the Navigation pane of the C•CURE 9000 Administration Workstation, click **Building Automation**. The Building Automation pane opens.

2. Right-click the **BACnet Device** folder, and then select **Edit BBMDs**.
3. On the **BBMD** pane, select a BBMD and then click **Remove**.

BBMD General Tab

From the BBMD General tab, you can set the name and description for the BBMD, and configure the communication settings for the device.

Figure 36: BBMD - General Tab



BACnet Object General Tab Definitions

The following table describes the BBMD General tab fields.

Table 19: BBMD General Tab Definitions

Field	Description
Name	Enter a unique name up to 50 characters long for BACnet Device. If you enter the name of an existing object, the system will not save the object, and will display an error message indicating there is a conflict. Choose a different name.
Description	Enter a general comment about the BACnet device that will help you identify the device. This text is for information only.
IP Address	IP address of BACnet device.
UDP Port	UDP port of BACnet device used to communicate with the physical device. Editable when BACnet device is disabled.

Configuring a BBMD Network

About this task:
The following configuration is an example of a Contemporary Controls BAS Router and NetGear IP Router. The BBMD device and IP Router from other vendor may have different configurations, which should follow the vendor's user guide.

The following images show the BBMD configuration steps and the BBMD Broadcast Distribution.

Figure 44: BBMD Configuration Steps

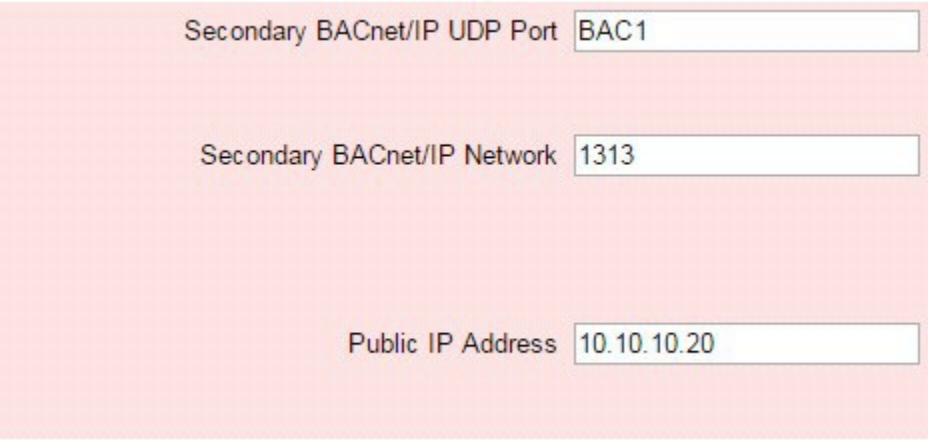
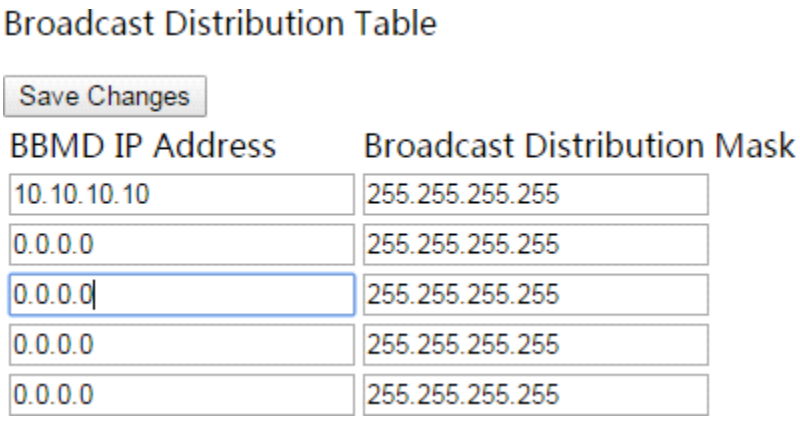


Figure 45: Broadcast Distribution



Perform the following steps to configure a BBMD Network.

BBMD Network Configuration

1. Set BBMD local IP address to 192.168.30.111.
2. Configure NAT IP Router 1
   - Set WAN IP address: 10.10.10.10.
   - Set LAN IP address: 192.168.30.1.
3. Configure NAT IP Router 2
   - Set WAN IP address: 10.10.10.20.
   - Set LAN IP address: 192.168.30.111.
   - Set Port forward 47809 message to 192.168.30.111.BACnet Device
4. Set BACnet device IP address to: 192.168.1.110.

BACnet Journal Messages

The BMS integration has customized Journal messages that are described here. In this chapter

BMS Integration Journal Message Definitions 115

BMS Integration Journal Message Definitions

The following tables list the Journal Messages that can be reported by the BMS Integration products to the C•CURE 9000 database. In the table, the symbol # represents an object such a BACnet device name, BACnet object name, or computer name. The actual value for the object property replaces the # in the Journal.

Table 20: BACnet State Change Journal Messages

Message Type	Object	State Change	Message
BACnet Device State Change	BACnet Device	Online	BACnet Device '#' communication restore.
		Offline	BACnet Device '#' communication failure.
		Operational	BACnet Device '#' is operational.
		Non-Operational	BACnet Device '#' is non-operational.

Table 21: BACnet COV Notification Journal Messages

Message Type	Object	State Change	Message
BACnet Object Value Change	Analog Input/ Output/ Value Object	Present Value Change	Present Value of Analog Input/ Output/Value '#' on BACnet Device '#' changed to #.
	Binary Input/ Output/ Value Object	Active	Present Value of Binary Input '#' on BACnet Device '#' changed to active.
		Inactive	Present Value of Binary Input '#' on BACnet Device '#' changed to inactive.
	MultiState Input/ Output/ Value Object	Present Value Change	Present Value of MultiState Input/Output/Value '#' on BACnet Device '#' changed to #.

Message Type	Object	State Change	Message
BACnet Object State Change	Analog Input/ Output/ Value Object	Alarm	Alarm Status of Analog Input/ Output/Value '#' on BACnet Device '#' changed to Alarm.
		Normal	Alarm Status of Analog Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Fault	Fault Status of Analog Input/ Output/Value '#' on BACnet Device '#' changed to Fault.
		Normal	Fault Status of Analog Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Out Of Service	Out Of Service of Analog Input/ Output/Value '#' on BACnet Device '#' changed to Out of Service.
		Normal	Out Of Service Status of Analog Input/Output/Value '#' on BACnet Device '#' changed to Normal.
	Binary Input/ Output/ Value Object	Alarm	Alarm Status of Binary Input/ Output/Value '#' on BACnet Device '#' changed to Alarm.
		Normal	Alarm Status of Binary Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Fault	Fault Status of Binary Input/ Output/Value '#' on BACnet Device '#' changed to Fault.
		Normal	Fault Status of Binary Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Out Of Service	Out Of Service of Binary Input/ Output/Value '#' on BACnet Device '#' changed to Out of Service.
		Normal	Out Of Service Status of Binary Input/Output/Value '#' on BACnet Device '#' changed to Normal.
	MultiState Input/ Output/ Value Object	Alarm	Alarm Status of MultiState Input/ Output/Value '#' on BACnet Device '#' changed to Alarm.

Message Type	Object	State Change	Message
		Normal	Alarm Status of MultiState Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Fault	Fault Status of MultiState Input/ Output/Value '#' on BACnet Device '#' changed to Fault.
		Normal	Fault Status of MultiState Input/ Output/Value '#' on BACnet Device '#' changed to Normal.
		Out Of Service	Out Of Service of MultiState Input/Output/Value '#' on BACnet Device '#' changed to Out of Service.
		Normal	Out Of Service Status of MultiState Input/Output/Value '#' on BACnet Device '#' changed to Normal.

Table 22: BACnet Event Notification Journal Messages

Message Type	Object	State Change	Message
BACnet Event Notification	Event Notification	High limit	AnalogInput'#' on BACnet Device '#' Changed from EVENT_State_HIGH_Normal to EVENT_ STATE_HIGH_LIMIT by EVENT_OUT_OF_RAGNE.
		High normal	AnalogInput'#' on BACnet Device '#' Changed from EVENT_State_HIGH_LIMIT to EVENT_ STATE_HIGH_NORMAL by EVENT_OUT_OF_RAGNE.
		Low limit	AnalogInput'#' on BACnet Device '#' Changed from EVENT_State_LOW_Normal to EVENT_ STATE_LOW_LIMIT by EVENT_OUT_OF_RAGNE.
		Low normal	AnalogInput'#' on BACnet Device '#' Changed from EVENT_State_LOW_LIMIT to EVENT_STATE_ LOW_NORMAL by EVENT_OUT_OF_RAGNE.

Table 23: BACnet System Activity Journal Messages

Message Type	Object	State Change	Message
BACnet System Activity	Driver	Start	System Activity: SoftwareHouse CrossFire BACnet Driver Service started on computer #.
		Stop	System Activity: SoftwareHouse CrossFire BACnet Driver Service stopped on computer #.