American Dynamics

From Tyco Security Products

victor BMS Integration Guide

version 5.4.1

8200-1147-1182 A0

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Introduction

Architecture

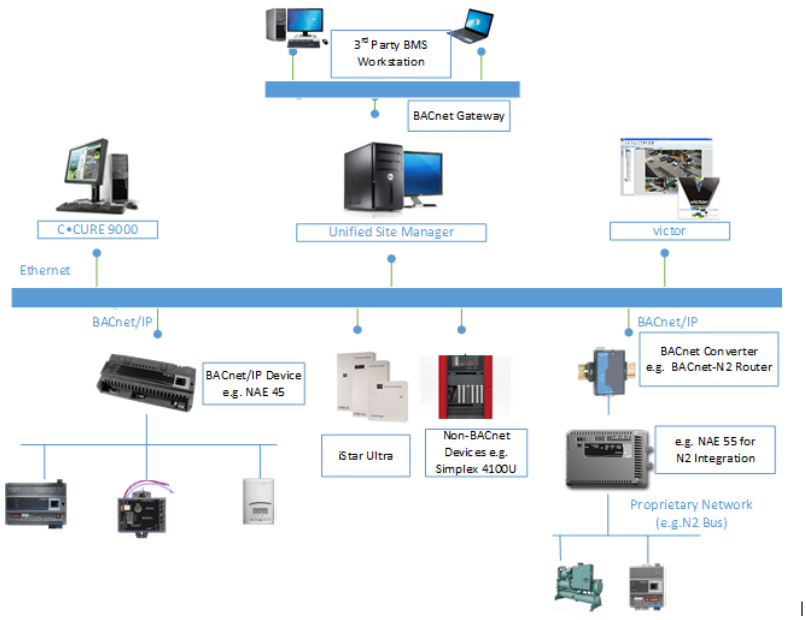
The objective of this integration is to provide the generic integration between the victor Application Server and building management devices based on BACnet protocol. If the device is based on another protocol, for example the N2, a protocol converter to BACnet such as the BACnet – N2 router is needed.

The BACnet Integration includes **Device Management**, **Alarm** and **Event Management**, **Trending**, **Scheduling** and **Action Management** feature, which works as Supervisory Controller and controls **BACnet Devices** directly.

The BMS Integration also provides a gateway function to map victor **Objects** to **BACnet Objects**. It provides the default and customizable **BACnet Gateway Templates**.

In this phase, the BMS Integration partially combines configuration functions and device control. Additionally, this integration provides a gateway mechanism for wrapping objects in victor to **BACnet Objects**, so the third party system can monitor victor object changes through BACnet protocol if necessary.

Figure 1: System Architecture



Features

The Unified victor Application Server BMS Integration software offers the following features:

- Features of the BMS Integration:
  - Installation on victor remote clients.
  - Support for up to 2000 **BACnet Objects**.
  - Supports **Import EDE File**.
  - **BACnet Device Automatic Discovery** and manual import of **BACnet Objects**.
  - **Alert** configuration and **Object Association** for **BACnet Devices** and **BACnet Objects**.
  - **User Role** (default and user defined) for **BACnet Device**, **BACnet Object** and **BACnet Action**.
  - **BACnet Device** and **BACnet Object** status.
  - Multi-condition **Triggers** by setting **Additional Status** on **BACnet Object Editor**.
  - 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, Read Property Multiple, **Write Property**, Write Property Multiple, **Subscribe COV**, **Subscribe COV Property**, Confirmed COV Notification, Unconfirmed COV Notification.
  - Localization of GUI and Journal.
  - All building activities are logged in the **Journal** for future investigative reporting.
  - Acknowledge **Event Notification** in **Alarm**.
  - **BACnet Gateway** function - map victor objects to **BACnet Objects**.
  - Default and customizable **BACnet Gateway Templates**.
  - BACnet Broadcast Management Device (BBMD): Manager BBMD - BACnet IP Communication across different networks.
  - Supports **BBMD**: BACnet IP Communication across different networks.
  - Supports BACnet Schedule: Read and modify BACnet schedules defined in BMS.
  - Supports MAP Widget: Added an option to hide object name for text widget, label widget and meter widget.
- Features of the victor User Interface:
  - **BACnet Device** objects displayed under **Device List** and **Sites** list.
  - **BACnet Device** and **BACnet Object Reports**.
  - **Find in Journal** and **Find on Map** for **BACnet Devices** and **BACnet Objects**.
- Features for victor **Maps**:
  - **BACnet Objects** animated by **widgets** on **Maps**.
  - **BACnet Devices** and **BACnet Objects** available on **Maps**.
  - **BACnet Device** and **BACnet Object** annunciation on **Maps**.

2

Installation

Minimum Requirements

Hardware

The BMS Integration has the same hardware requirements as victor Unified Client and victor Application Server. Therefore, if the machine can successfully run victor then it will satisfy BMS Integration requirements. BMS Integration requires approximately 50MB of available hard disk space.

Software

- victor Application Server: v5.4.1
- victor Unified Client: v5.4.1

Operating Systems

64-bit operating systems:

- Windows Server 2019
- Windows Server 2016 R2
- Windows Server 2012 R2 SP1
- Windows 10 Professional
- Windows 10 Enterprise
- Windows 8.1 Professional SP1
- Windows 8.1 Enterprise SP1
- Windows 7 Professional SP1
- Windows 7 Enterprise SP1

Adding the BMS Integration to victor

NOTE

- If the correct version of victor is not installed on your system, a message is displayed stating that a supported version of victor is needed.
- The install process stops all **Site Manager Services**. These services must be restarted on victor Site Manager machines once the install is complete.

1. Acquire the BMS Integration Installation Program from the American Dynamics website.
2. Right-click on **Setup.exe**, and then click **Run as administrator**.
3. The Install Wizard and the BMS Integration Welcome screen appears. Click **Next**.
4. Select **I accept the terms of the license agreement**, and then click **Next**.
5. On the **Custom Setup** dialog box, click **Next**.

NOTE

If this is a server installation, the authentication method can be changed in the **Database Server Credentials** dialog box:

- Windows authentication credentials of current user – the default.
- Server authentication using the **Login ID** and **Password** below – if you previously configured an SQL server, you can create a **Login ID** and **Password** to act as authentication credentials for the SQL database.

6. To continue with the installation, click **Next.**
7. On the **Ready to Install the Program** dialog box, click **Finish.**
8. Restart **Site Manager Services** when install is complete.

3

Operation

Operation of BMS

Roles

BACnet Device and **BACnet Object** privileges and context menu verbs are associated with victor **Roles**. For more information on **Roles**, refer to the *victor Unified Client / victor Application Server Administration and Configuration Guide*.

Associations

BACnet Devices and **BACnet Objects** support victor's **Object Association**. This refers to the link between unrelated victor **Objects** with the intent of enabling incident building capability. For more information on **Associations**, refer to the *victor Unified Client / victor Application Server Administration and Configuration Guide*.

Reports

BACnet Devices and **BACnet Objects** are included in the report selection tool and support the victor **Find in Journal** feature. The BMS Integration also supports **BACnet Device State Change**, **BACnet Object State Change**, and **BACnet Object Value Change Activity Type** in the report selection tool. For more information on **Reports** and the **Find in Journal** feature, refer to the *victor Unified Client / victor Application Server Administration and Configuration Guide*.

Events

BACnet Devices and **BACnet Objects** support victor **Events**, in detecting, monitoring, and recording specific activities on the system. For further information on **Events**, refer to the *victor Unified Client / victor Application Server Administration and Configuration Guide*.

Maps

BACnet Devices and **BACnet Objects** support victor **Maps**, **Find on Map**, and animated widgets feature. For more information on Maps and the **Find on Map** feature, refer to the *victor Unified Client / victor Application Server Administration and Configuration Guide*.

Administration Functions

BACnet Device and **BACnet Object Editor** allows configuration of communication details and associations. Configured **BACnet Devices** are displayed as hardware objects in the victor **Device List**.

Accessing detailed hardware information

1. Click 
2. Click **BACnet Devices** or click **BACnet Objects**.
3. Right-click the **BACnet Device** or **Object**, and then click **Edit**. Detailed hardware information appears.

Auto Discovery of a BACnet Device

The BMS Integration discovers **BACnet Devices** and its objects automatically by broadcasting WHO-IS and receiving I-AM messages through the BACnet protocol. You can choose and save the device and objects to be imported.

1. Click  , then click **Auto Discovery**.
2. On the left-hand side of the **Auto Discovery BACnet Devices** window, select devices to be imported. The selected devices will appear as a list on the right-hand side of the screen.
3. Click **Scan Selected Device**.
4. By default, all **BACnet Objects** will be selected. Clear any devices you do not want to import.
5. Click **Save and Close**.

Creating new BACnet Devices manually

In the case the **BACnet Device** is offline and cannot be discovered automatically, you can manually add the **BACnet Devices**.

1. Click  , then click **BACnet Devices**.
2. The **Enabled checkbox** is selected by default. To deactivate the **BACnet Device**, clear the checkbox.
3. In the **Name** field, enter a name for the **BACnet Device**.
4. In the **Description** field, enter a description for the **Map**.
5. Enter the **Device ID**, **IP Address**, and **UDP Port** of the created **BACnet Device**.

NOTE

- Device ID, IP Address, MAC Address are necessary fields. The default value for Port is 47808 and default value for Network ID is 0.
- You must update the port and network ID same as your device, before saving the device, otherwise the device does not change to online.

6. Under the **Associations** section, click  .
7. Select an **Association** type from the left column. This will filter results in the right column
8. Select the required association from the right column, and then click **OK**.
9. If more associations are required, repeat steps 6 to 8.
10. Click **Save and Close**.

Viewing BACnet Devices

You can view a **BACnet Device** after it is imported into victor Application Server. All properties will be read-only and cannot be edited.

1. Click 

2. Click **BACnet Device**. All configured **BACnet Devices** are displayed in an **Object List**.

Importing BACnet Objects manually

1. On the **Devices** list or **BACnet Device Object List**, right-click the **BACnet Device**.
2. Click **Import Device Object**. This will open the **Auto Discovery BACnet Devices** window and will begin to retrieve **BACnet Objects** in this device.

NOTE

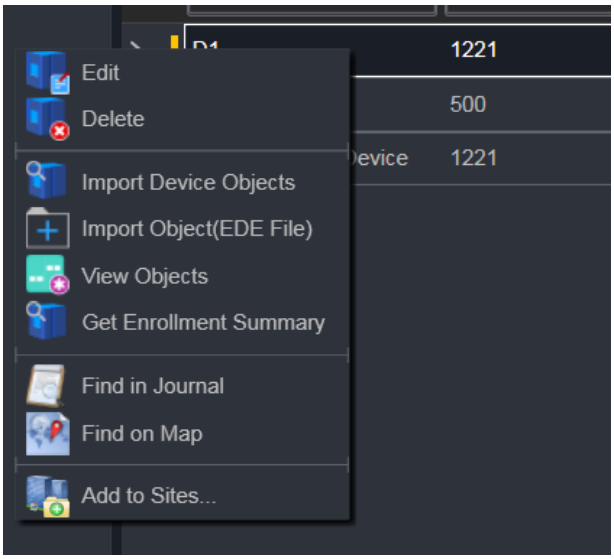
- When retrieval of the **BACnet Objects** are completed, all available **BACnet Objects** will be listed on the right grid.
- By default, all **BACnet Objects** are selected. Deselect the objects that you do not want to import. Onjects that are listed as modified are already imported into the system.

3. Click **Save and Close**.

Importing BACnet Objects by Engineering Data Exchange (EDE) File

1. On the **Devices** list or **BACnet Device Object List**, right-click the **BACnet Device**.
2. Click **Import Object (EDE File)**, as shown in Figure 1.

Figure 2: BACnet Device list tree



3. You can also **Import Object (EDE File)** by selecting  in the **BACnet Device Editor**, as shown in Figure 2. This opens the **Import Object (EDE File)** window, as shown in Figure 3.

Figure 3: BACnet Device Editor

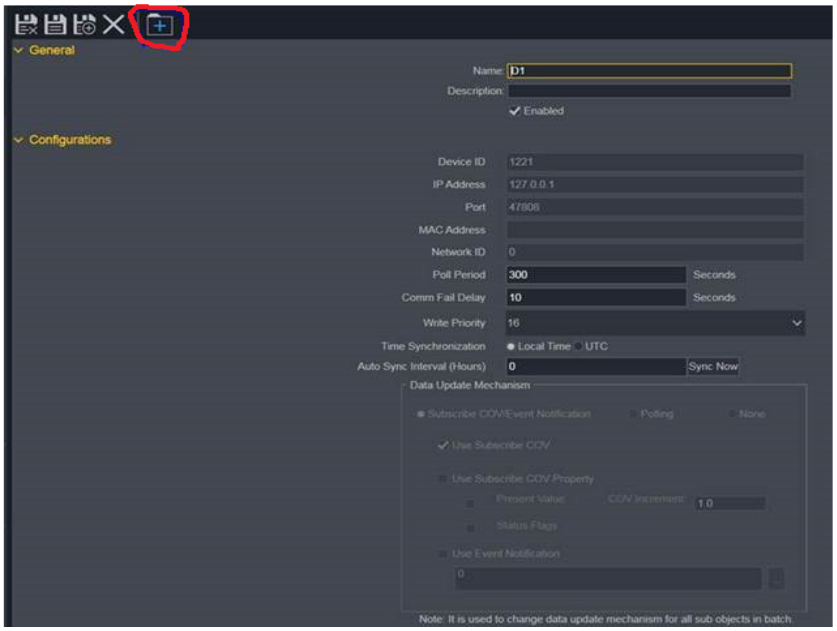
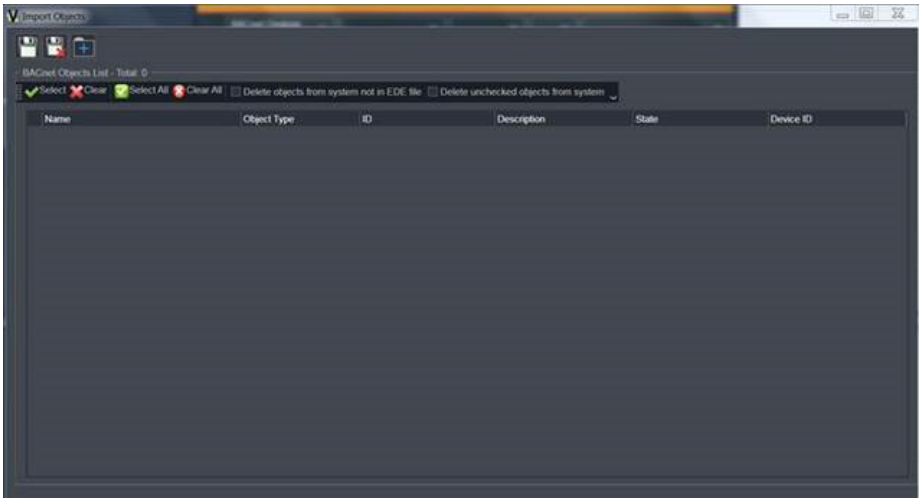
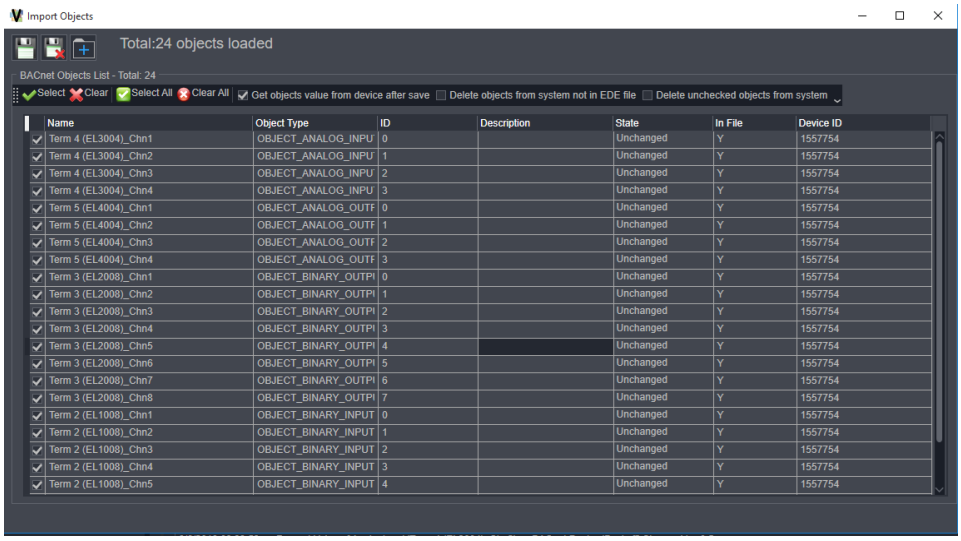


Figure 4: Import Object (EDE File) Window



4. Select **EDE File**, the data is read to the data grid, as shown in Figure 4.

Figure 5: BACnet Device Data Grid Window



NOTE

Following are the definitions of the values mentioned in the **State** and **In File** columns (as shown in Figure 4):

State:

- **New**: Object is new and does not exists in system.
- **Unchanged**: Object already exists in system and there is no any change for all properties of the objects.
- **Modified**: Object already exists in system but some properties of the objects are modified such as Name, Present Value etc.

In File: If customer imports another EDE file, the system loads all objects both in victor DB and EDE file. The **In File** is used to identify objects that are not existed in the new imported file.

- Y means the objects are loaded from EDE file.
- N means the objects are loaded from victor DB, and this objects are not existed in the new imported EDE file.

If the customer selects the option **Delete objects from system not in EDE file**, all the N marked objects will be deleted after save.

5. You can select multiple rows or clear multiple rows.
6. SeeTable 2 on Page 18 following are the definition of the options on the **Import Object** tab:

Table 1: Import Objects tab options and definitions

Options	Definitions

Select Clear	You can click the Select button to check the selected objects. You can slick the clear button to uncheck the selected objects.
Select All	You can click the Select All button to check all the objects in datagrid.
Clear All	You can click the Clear All button to uncheck all the objects in datagrid.
Get objects value from device after save	Default is checked: If there is no present value in EDE file, the BMS system sets 0 as the default value. This may cause the actual present value in device appear different from the value in system data base. BMS driver selects **get objects value from device after save** to make sure the present value in system is same as device, this process may take some time, depending on the objects number.
Delete objects from system not in EDE file	You can check **Delete objects from system not in EDE file** option to delete the objects which are not existed in the imported EDE file.
Delete unchecked objects from system	You can check **Delete unchecked objects from system** option to save only the checked objects to system, delete all other objects in the system.

Editing BACnet Devices or BACnet Objects or BACnet Schedule Objects

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

1. Select 
2. Select **BACnet Device** or **BACnet Object** or **BACnet Schedule Object**.
3. Select the Device or Object to edit.
4. Enter a **Name**.
5. Enter a **Description**.
6. Make edits in the **BACnet Device Editor** or **BACnet Object Editor** or **BACnet Schedule Object Editor**.
7. See Table 2 on Page 18 regarding the **Data Update Mechanism** for editing **BACnet Devices** or **BACnet Objects** or **BACnet Schedule objects**.

NOTE

- Increase the poll period accordingly when the **BACnet Object** amount increases.
- **Data Update Mechanism** can be set for **BACnet Objects** when the **BACnet Device** is disabled. All **BACnet Objects' Data Update Mechanism** update here accordingly once the change is confirmed.

8. Click **Save and Close**.

Table 2: Data Update Mechanism Definitions

Data Update Mechanism	
Subscribe COV/Event Notification	**Use Subscribe COV**: Update data by subscribing COV service. When **Use Subscribe COV** is enabled, the subscription period is 28800 seconds (8 hours) by default. The BMS Integration will automatically re-subscribe before subscription expires. You can change the subscription period by the adding following line: <add key="COVLifeTimeValue" value="28800"/> in ConnectedPro.HardwareInterface.BACnet.DriverService.exe configuration file. This file is located under Installation path: \Tyco\CrossFire\ServerComponents. **Use Subscribe COV Property**: Update **Present Value** and /or **Status Flag** by subscribing the **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 subscribing to **Use Event Notification**. To use this mechanism, **Notification Class** should be pre-configured on a **BACnet Device**, If subscribed Event Notification Class Required Ack, then BMS Integration will list ACK-Required Event Notification. The BMS Integration uses 12505 network ID to communicate, you can change 12505 by adding the following line: <add key="LocalBACnetNetworkID" value="12505"/> in ConnectedPro.HardwareInterface.BACnet.DriverService.exe configuration file. This file is located under installation path: \Tyco\CrossFire\ServerComponents.
Polling	Update data by polling the value and status. The polling period shares the value with the **BACnet Device**.
None	None of the above mechanisms.
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.
Effective Period	This property specifies the range of dates within which the Schedule object is active.
Weekly Schedule	This property correspond to the days Monday - Sunday, Each day consists of a list of BACnet Time Values 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	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

Deleting BACnet Devices

1. Right-click the **BACnet Device**, and then click **Delete**.
2. Click **Yes** on the dialog box to confirm deletion.

Viewing BACnet Objects

1. Click 
2. Click **BACnet Objects**. All configured **BACnet objects** are displayed in an **Object List.**

Deleting BACnet Objects

1. Right-click the **BACnet object**, then click **Delete**.
2. Click **Yes** on the dialog box to confirm deletion.

New BACnet Actions

1. Click  , then click **BACnet Actions**.
2. In the **Name** field, enter a name for the **BACnet Device**.
3. In the **Description** field, enter a description for the **BACnet Device**.
4. Click  for **BACnet Device** field to open **Object Selector window**.
5. Select a **BACnet Device**, and then click **OK** to return to **BACnet Action Editor**.
6. Click  for **BACnet Object** field to open **Object Selector window**.
7. Select a **BACnet Object**, and then click **OK**.
8. Set the **Target Value** of selected the **BACnet Object**.
9. Click **Save**.

Viewing BACnet Actions

1. Click 
2. Click **BACnet Actions**. Configured **BACnet Actions** appear in the **Object List**.

Editing BACnet Action

1. Select 
2. Select **BACnet Action**, and then select the action to edit.
3. Made edits as required.

4. Click **Save**.

Handling Event Notification and Alarm Acknowledge

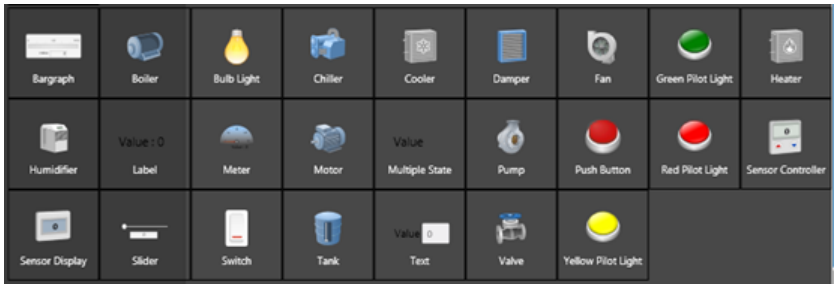
1. Click 
2. Click **Ack Required**. All **Events** are listed in the **Event Notification in Alarm** form.
3. Right-click the **Event**, and then click **Acknowledge**.

Widgets on a Map

Overview

The BMS 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**, and **Valve** widgets.

Every widget supports: **Alarm Status**, **Enabled**, **Fault Status**, **Object Name**, and **Present Value** properties. After the BMS Integration is installed on victor, the widgets are available on the **Icon Selector**.



You can associate a victor **Object** with a widget. The widget is then able to display the real time value and different animations for different **States** such as: **Alarm**, **Fault**, and **Disable**. These states and their markups are illustrated below:

State	Markup
Disable	
Alarm	
Fault	

The priority of these states are: **Disable>Alarm>Fault**.

Adding a Widget on a Map

1. On the **Map Editor**, click  .
2. On the **Icon Selector**, click the widget you want to use.

NOTE All widgets can be a binding input/value object. The widget is recommended to bind to an output object, such as: the **Sensor Controller**, **Switch**, **Tank**, **Bulb Light**, **Push Button**, **Bargraph**, **Slider**, and **Text**.

3. Position the **widget** in the appropriate location on the **Map**.
4. Right-click the widget, and then click **Drop on map**. The **Icon Editor** opens.

5. On the **Icon Editor**, click the **Select Object** button to open the **Object Selector** which links a **BACnet Object** to the **widget**.
6. Select the object, and then click **OK**.
7. On the **Icon Editor**, click **OK**.

NOTE

- Once the **BACnet Object** is selected, the system assigns properties automatically if the widget's property name matches the object's property name. If the name does not match and the corresponding **Assigned Property** is empty, you need to perform manual assignment. Click the cell and select the property from the drop-down list.

8. To finish, click **Save and Close**.

Description of Widgets

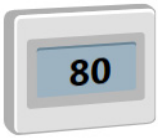
The following table illustrates the descriptions, properties and options of available animated **widgets**.

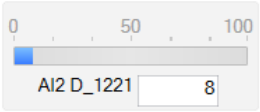
Table 3: Widget Descriptions

Name	Description	Properties	Options	Animation
Heater	The widget indicates 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: displays the present value in view mode. False: is the default value.	 The Heater is off  The Heater is on, and the red frame size will adjust according to the heating output.
Cooler	The widget indicates 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: displays the present value in view mode. False: is the default value.	 The Cooler is off.  The Cooler is on, and the blue snowflake size will adjust according to the cooling output.
Boiler	The widget indicates 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.	 The Boiler is off.  The Boiler is on and the red flame size will adjust according to the boiler output.
Chiller	The widget indicates 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.	 The Chiller is off.  The Chiller is on.

Name	Description	Properties	Options	Animation
Humidifier	The widget indicates humidifier output (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.	 The Humidifier is off.  The Humidifer is on.
Fan	The widget indicates 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.	 The Fan is off.  When the fan output is higher than 0, the fan rotates. The speed will adjust according to the fan output.
Pump	The widget indicates 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.	 The Pump is off.  When the pump output is higher than 0, the pump revolves. The speed will adjust according to the pump output.
Damper	The widget indicates 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.	 The Damper is off.  When the damper output is higher than 0, the grid of damper will move. The speed will adjust according to the damper output.

Name	Description	Properties	Options	Animation
Valve	The widget indicates 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.	 The Valve is closed.  When the valve output is higher than 0, the valve will open. The valve position will adjust according to the valve output.
Motor	The widget indicates motor on or 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: displays the present value in view mode. False: is the default value.	 The Motor is off.  The Motor is on.
Tank	The widget indicates what percent the tank is filled (1~100%).	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Large Change: click PAGE UP or PAGE DOWN to change value. Default value is 1. Maximum Valve: 100 Minimum Valve: 0 Show Present Value: True or False. True: displays the present value in view mode. False: is the default value. Click the arrow key to change value. Default value is 0.1.	 The Tank is off.  The 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 Value: 180 Minimum Value: 0 Show Present Value: True or False. True: Displays the Present Value and Project Name in view mode. False: is the default value.	
Sensor Controller	The widget displays the sensor analog value together with its unit e.g. 72.9°	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Value: 100 Minimum Value: 0 Step Value: the increase or decrease of step value. Default value is 1. Unit: the unit of value.	 Click the **Up** arrow to increase sensor value by one step. Click **Down** arrow to decrease sensor value by one step.
Sensor Display	The widget displays the sensor analog value together with its unit e.g. 72.9°	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Value: 100 Minimum Value: 0 Step Value: the increase or decrease of step value. Default value is 1. Unit: the unit of value.	
Switch	The widget indicates on or off state of binary input or value. Click this widget to change the binary input or value status.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	 The Switch is off.  The Switch is on.

Name	Description	Properties	Options	Animation
Bulb Light	The widget indicates on or off state of binary output or value. Click this widget to change the binary input or value status.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Rotation: 0~360	 The Bulb is off.  The Bulb is on.
Pilot Light	The widget indicates on or off state of binary output or value.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	 The Pilot light is off.  The Green pilot light is on.  The Yellow pilot light is on.  The Red pilot light is on.
Push Button	The widget indicates on or off state of binary output or value. Click this widget to change the binary input or value status.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide	 The Push button is off.  The Push button is on.
Bargraph	The widget displays an analog value together with the Name. The user can change the value in the textbox.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Value: 100 Minimum Value: 0 Unit: the unit of value. The unit, maximum, and minimum are configurable.	

Name	Description	Properties	Options	Animation
Slider	The widget displays an analog value. The user can change the value by slider or input the value in the textbox directly.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Large Change: click **PAGE UP** or **PAGE DOWN** to change value. Default value is 1. Maximum Valve: 100 Minimum Valve: 0 Small Change: click the arrow key to change value. Default value is 0.1. Unit: the unit of value. The minimum and maximum is configurable.	
Label	The widget displays a read-only analog value together with the 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 and name are configurable. Show Object Name: True or False.	AI_2 D_1221 : 8
Multiple State	The widget displays a read-only multi state value together with the Name. the Name is configurable.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide State Text: split with ","	MI_2 D_1221 : off
Text	The widget displays an analog value together with Unit or Name. The user can change the value in the textbox.	**Alarm Status** **Enabled** **Fault Status** **Object Name** **Present Value**	Alarm Annunciation: Blink, Normal, Hide Fault Annunciation: Blink, Normal, Hide Maximum Value: 100 Minimum Value: 0 Unit: the unit of value. The unit, name, maximum, and minimum are configurable. Show Object Name: True or False.	AI_2 D_1221 8

Editing a Widget on a Map

1. On the **Map Editor**, right-click the widget.
2. Select the **Edit Context** menu to enter the **Widget Editor**.
3. Make the edits and then click **OK**.

Deleting BACnet Objects on a Map

1. On the **Map Editor**, right-click the widget.
2. From the **Map Context** menu, click **Remove**.
3. Click **Yes**.

4

BACnet Gateway

Overview

BACnet Gateway provides a mechanism for wrapping **Crossfire Objects** to **BACnet Objects**. It also implements the **BACnet Services** such as **Alarm** and **EventServices**, **Object Access Services**, and **Remote Device Management Services**. If necessary, **Crossfire Object** changes and notifications can be monitored through BACnet protocol.

BACnet Gateway Template

The **BACnet Gateway Template** defines the mapping definition to map victor object to **BACnet Objects**.

The BMS Integration provides the default **BACnet Gateway Templates** and customizable templates.

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**.

Perform the following steps to establish a **BACnet Gateway**:

Adding a new BACnet Gateway Template

1. Click  , then click **BACnet Gateway Template**.
2. Enter **Name** in the Name field.
3. Enter **Description** in Description field.
4. Click **Save and Close**.

Creating a Gateway Device

1. Click  , then click **BACnet Gateway Device**.
2. Enter **Name** in the Name field.
3. Enter **Name** in the Name field.
4. Click **Save and Close**. The newly created **Gateway Device** appears in the **Device List** under **BACnet Gateway Devices**.

Monitored Mapping

1. Click  , then expand the **BACnet Gateway Devices** group.
2. Right-click the created Gateway Device, then click **Create Mapping**.
3. On the **Gateway Template Form**, select a template and click **Generate**.
4. On the **Gateway Mapping and Binding Form**, select one **Mapping Definition** and the **Binding Instances** to be mapped. Click **Generate**.
5. When finished viewing the process results, click **OK**.

Editing a BACnet Gateway Object

1. Click  , and then click **BACnet Gateway Object**.
2. Select a Gateway Object to edit.
3. Make edits as required.
4. Click **Save and Close**.

Managing a BACnet Gateway Template

1. Click  , then click **BACnet Gateway Template**.
2. Right-click the selected template, and then click **Edit**.
3. Make the edits as required.
4. Click **Save and Close**.

5

BACnet Broadcast Management Device (BBMD)

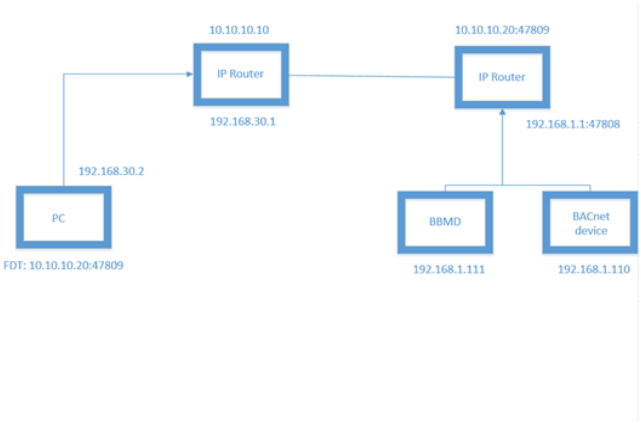
Overview

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 figure below displays the Topology of first Supported and Test network of BBMD

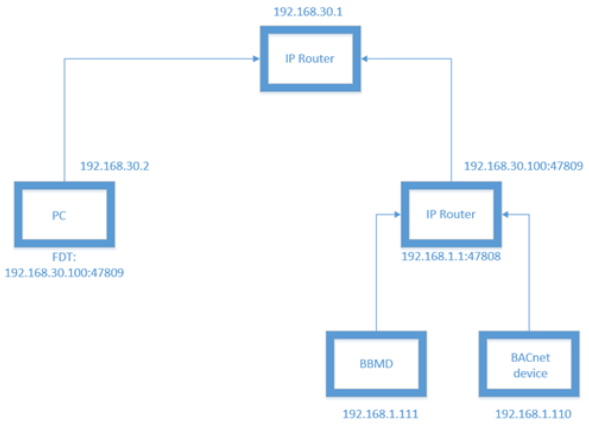
Figure 6: Supported and Test Network Topology - First



Supported and Tested BBMD Network - Second

The figure below displays the Topology of Second Supported and Test network of BBMD

Figure 7: Supported and Test Network Topology - Second



A new BACnet BBMD

Many BACnet/IP devices or applications support a feature entitled Foreign Device Registration (FDR). FDR allows the BACnet/IP device or application to send its broadcast messages to a BBMD. The BBMD will then forward these broadcast messages to all other BBMDs and all other FDR devices.

Perform the following steps to access the BACnet Broadcast Management Device (BBMD).

Adding a new BACnet BBMD

1. Click , then click **BACnet BBMD**.
2. Enter **Name** in the Name field.
3. Enter **Description** in Description field.
4. Enter the IP address of **BACnet BBMD**.
5. Enter the **Port**.
6. Click **Save and Close**.

Editing a BACnet BBMD

1. Click , and then click **BACnet BBMD**.
2. Select a **BACnet BBMD** to edit.
3. Make edits as required.
4. Click **Save and Close**.

Deleting the BACnet BBMD

1. Right click the **BACnet BBMD**, and then click **Delete**.

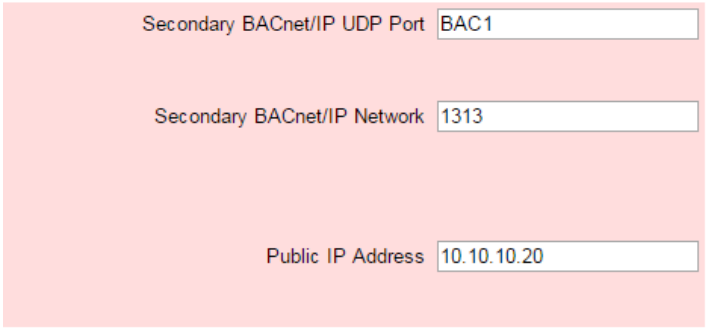
2. Click **Yes** on the dialog box to confirm deletion.

Configuring a BBMD Network

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 configuration, which should follow the vendor's user guide.

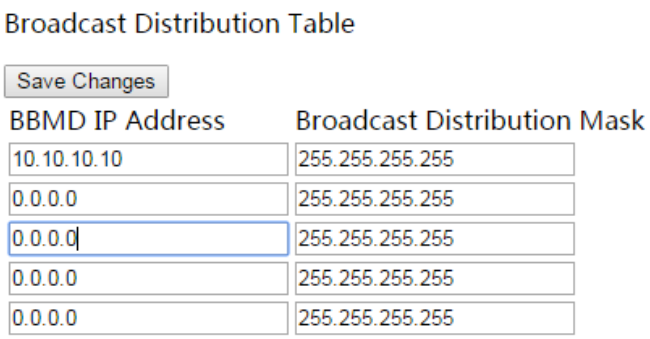
The Figure below shows the BBMD configuration steps.

Figure 8: BBMD Configuration Steps



The Figure below shows the BBMD Broadcast Distribution.

Figure 9: Broadcast Distribution



Perform the following steps to configure a BBMD Network.

BBMD Configuration

1. Set BBMD local IP address to 192.168.30.111.

NAT IP Router 1 configuration

1. Set WAN IP address: 10.10.10.10.
2. Set LAN IP address: 192.168.30.1.

NAT IP Router 2 configuration

1. Set WAN IP address: 10.10.10.20.
2. Set LAN IP address: 192.168.30.111.
3. Set Port forward 47809 message to 192.168.30.111.

BACnet Device

1. Set BACnet device IP address to: 192.168.1.110.