



Guide for configuring and working with the BACnet Wrapper integration module

ACFA PSIM 1.3

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1 List of terms used in the Guide for configuring and working with the BACnet Wrapper integration module

BACnet is a network protocol used in building automation system and access control networks.

BACnet Device is an authorisation system device (controller, sensor, executing mechanism) that supports the *BACnet* protocol.

BACnet Channel is a connection channel between the *BACnet* device and *Axxon PSIM* (analog, digital, and so on), represented in the system as an object.

BACnet Property is a property of the system object that represents the data received from the *BACnet* device via a *BACnet* channel.

BACnet Rule is the microprogram in *Axxon PSIM* that is used to process the values of a *BACnet* property.

BACnet Provider is the microprogram in *Axxon PSIM* that allows forwarding events and/or parameters of *Axxon PSIM* objects to the selected port via the *BACnet* protocol.

2 Introduction into the Guide for configuring and working with the BACnet Wrapper integration module

On the page:

- Purpose of the document
- General information about the BACnet Wrapper integration module

2.1 Purpose of the document

The *Guide for configuring and working with the BACnet Wrapper integration module* is a reference and information manual and is intended for configuration specialists and operators of the *BACnet Wrapper* integration module.

The Guide has the following information:

1. General information about the *BACnet Wrapper* integration module;
2. Configuration of the *BACnet Wrapper* integration module;
3. Working with the *BACnet Wrapper* integration module.

2.2 General information about the BACnet Wrapper integration module

The *BACnet Wrapper* integration module is used for connecting any devices supporting the *BACnet Ethernet* protocol. The *BACnet Wrapper* integration module allows you to perform data exchange and data processing between *Axxon PSIM* and *BACnet devices*.

Note

All standard device types are supported. The operation of non-standard device types isn't guaranteed.

3 Licensing of the BACnet Wrapper integration module and list of supported systems

The *BACnet Wrapper* integration module is licensed per one device.

Systems, the operation of which is guaranteed via the *BACnet Wrapper* universal integration:

Name	Functionality of integration in Axxon PSIM
Sterownik FSG	<ul style="list-style-type: none"> • open/close of fire dumper; • set the angle of fire dumper; • receive the current state of connected devices; • receive states of fire dumper (open, close, damaged); • control program that controls all fire dumpers in case of damage; • show temperature inside the ventilation tunnels; • control smoke exhaust fan

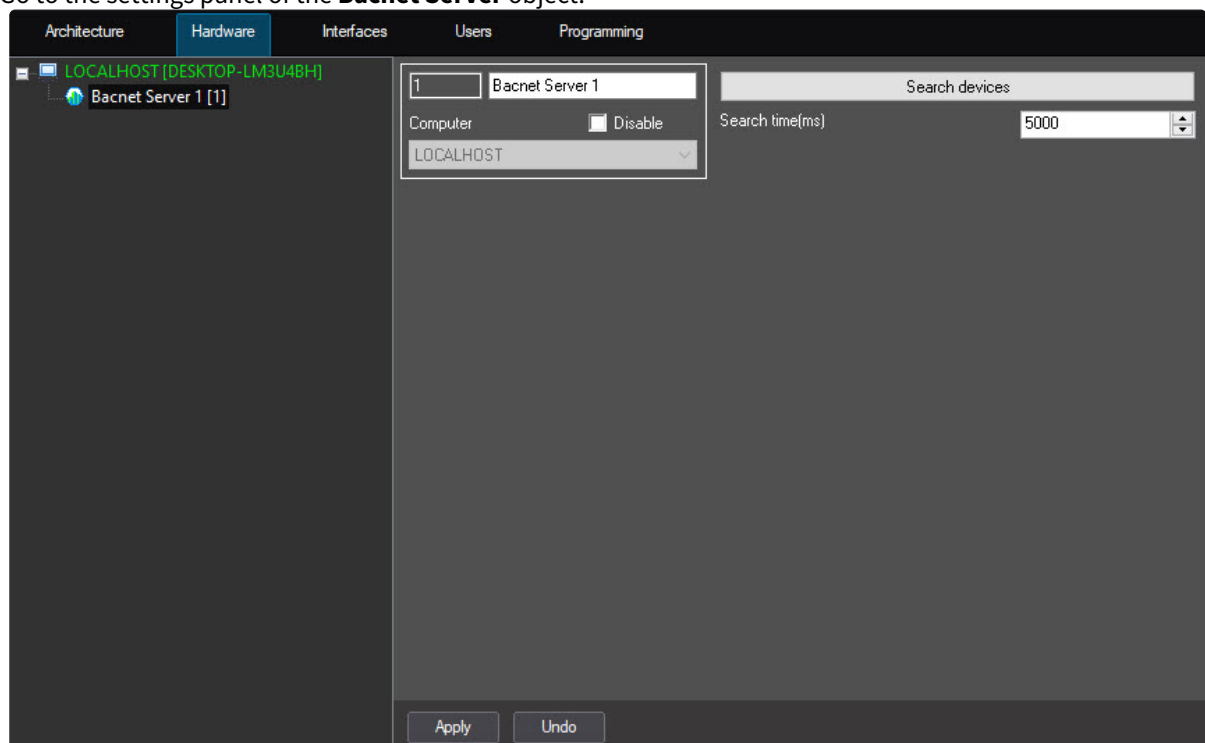
4 Configuration of the BACnet Wrapper integration module

4.1 Activation of the BACnet Wrapper integration module and search for BACnet devices

To activate the *BACnet Wrapper* integration module, create the **Bacnet Server** object on the basis of the **Computer** object on the **Hardware** tab of the **System settings** window.

To search for devices that support the *BACnet* protocol in the local network, do the following:

1. Go to the settings panel of the **Bacnet Server** object.



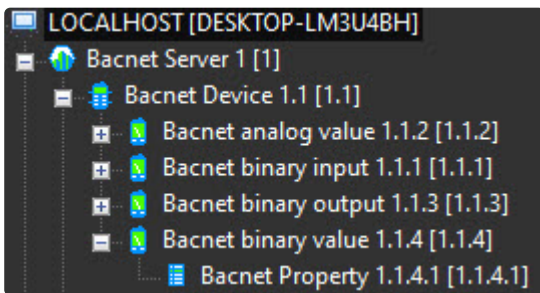
are

2. In the **Search time(ms)** field, specify the time period during which the system queries the network for the *BACnet* devices.
3. Click the **Search devices** button.

Note

If there are several network connections on the computer where the search is performed, we recommend disabling all of them for the time of the search, except the one that provides the connection to the local network with the *BACnet* devices. You can also add *BACnet* devices manually and load their child objects when the IP address, port number, and the ID of a *BACnet* device are known (see [Configuring the BACnet device](#)). You can get these parameters from the *BACnet* software.

As a result, the search for the *BACnet* devices is performed, and the corresponding objects are created in the hardware tree.



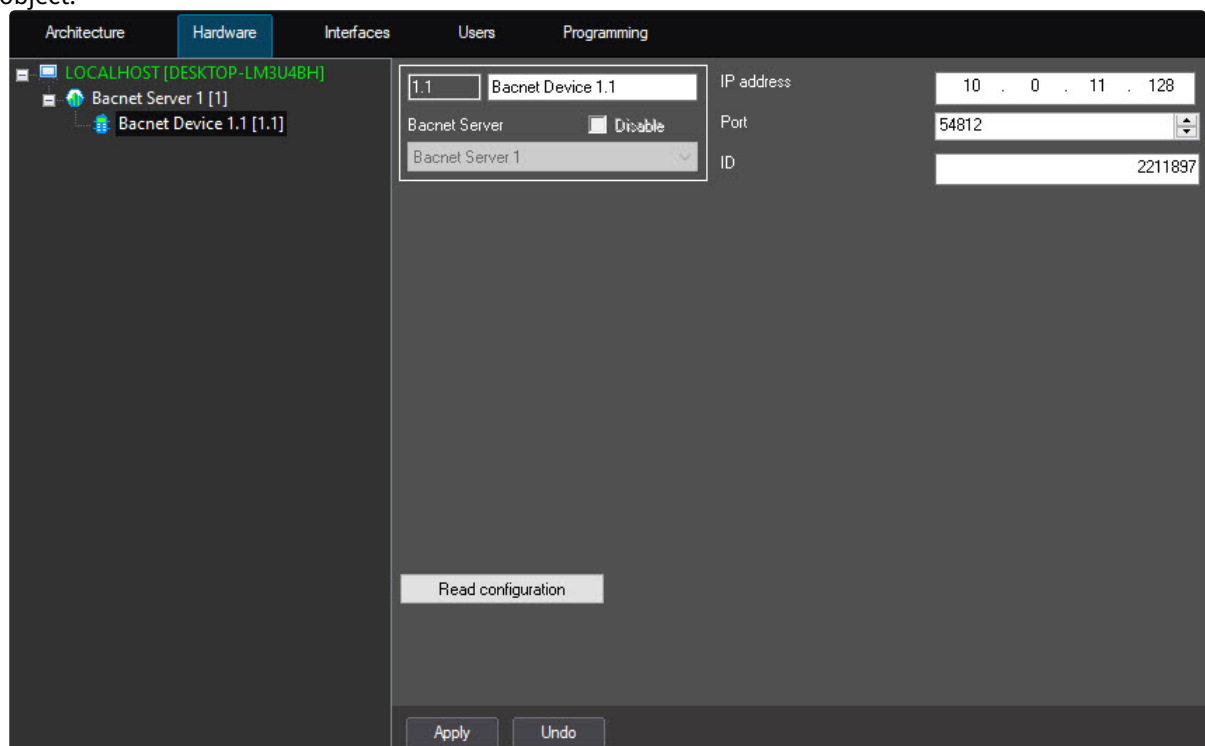
Activation of the *BACnet Wrapper* integration module and search for *BACnet* devices are complete.

4.2 Configuring the BACnet device

Objects corresponding to the *BACnet* devices are created automatically when you search for them (see [Activation of the BACnet Wrapper integration module and search for BACnet devices](#)). No additional configuration is required.

To add or configure a *BACnet* device manually, do the following:

1. Go to the settings panel of the **Bacnet Device** object that is created on the basis of the **Bacnet Server** object.



2. In the **IP address** field, enter the IP address of the *BACnet* device that you can get from the *BACnet* software.
3. In the **Port** field, enter the port of the *BACnet* device that you can get from the *BACnet* software.
4. In the **ID** field, enter the identification number of the *BACnet* device that you can get from the *BACnet* software.
5. Click the **Apply** button to save the changes.
6. Click the **Read configuration** button to read the configuration of the *BACnet* device and build a child object tree.

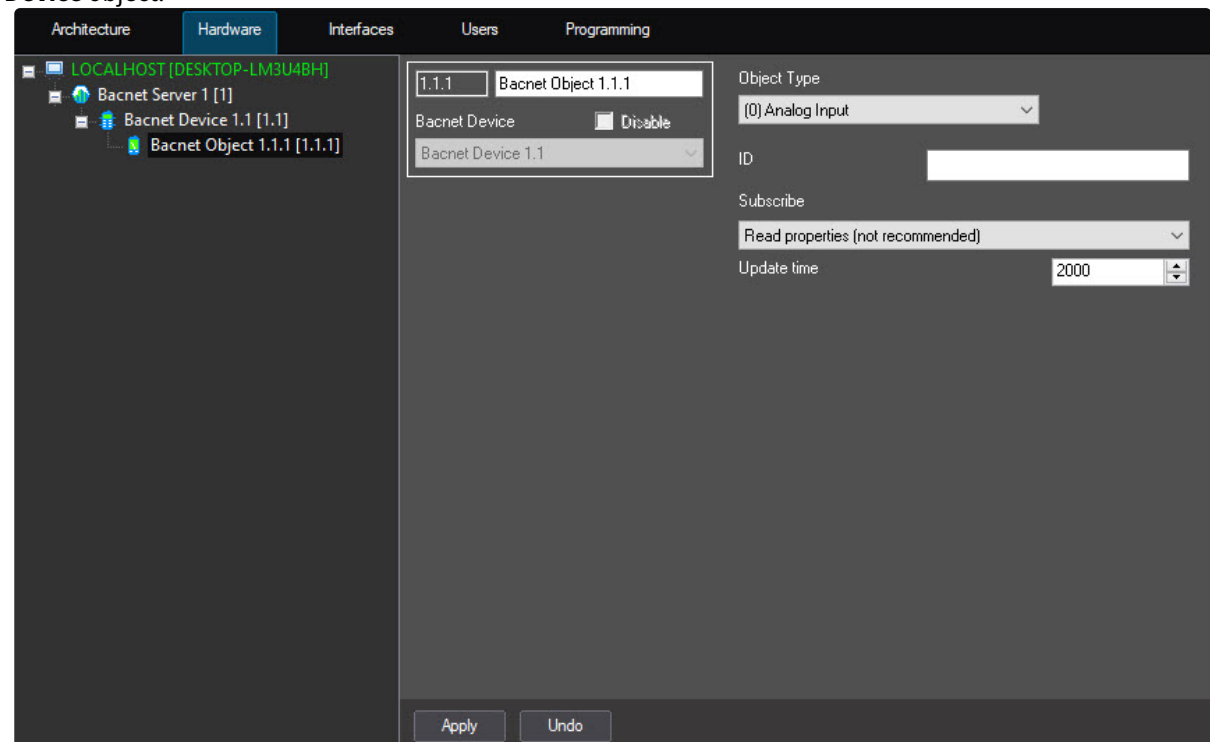
Configuration of the *BACnet* device is complete.

4.3 Configuring the BACnet object

The *BACnet* object corresponds to the *BACnet* device channel. It is created automatically during the devices search (see [Activation of the BACnet Wrapper integration module and search for BACnet devices](#)).

To add or configure a *BACnet* object manually, do the following:

1. Go to the settings panel of the **Bacnet Object** object that is created on the basis of the **Bacnet Device** object.



2. From the **Object Type** drop-down list, select one of the channel types.
3. In the **ID** field, enter the identification number of the channel.
4. From the **Subscribe** drop-down list, select the method for monitoring the changes in the values of the *BACnet* object:
 - a. **None**—no subscription. The changes in object parameters are not monitored.
 - b. **Normal**—standard subscription type. When the object parameter changes, the value is immediately sent to the *BACnet Wrapper* integration module.
 - c. **Read properties (not recommended)**—parameters reading at a specified time interval.
 - i. In the **Update time** field, enter the time period in milliseconds for reading the parameters of the *BACnet* object.

Note

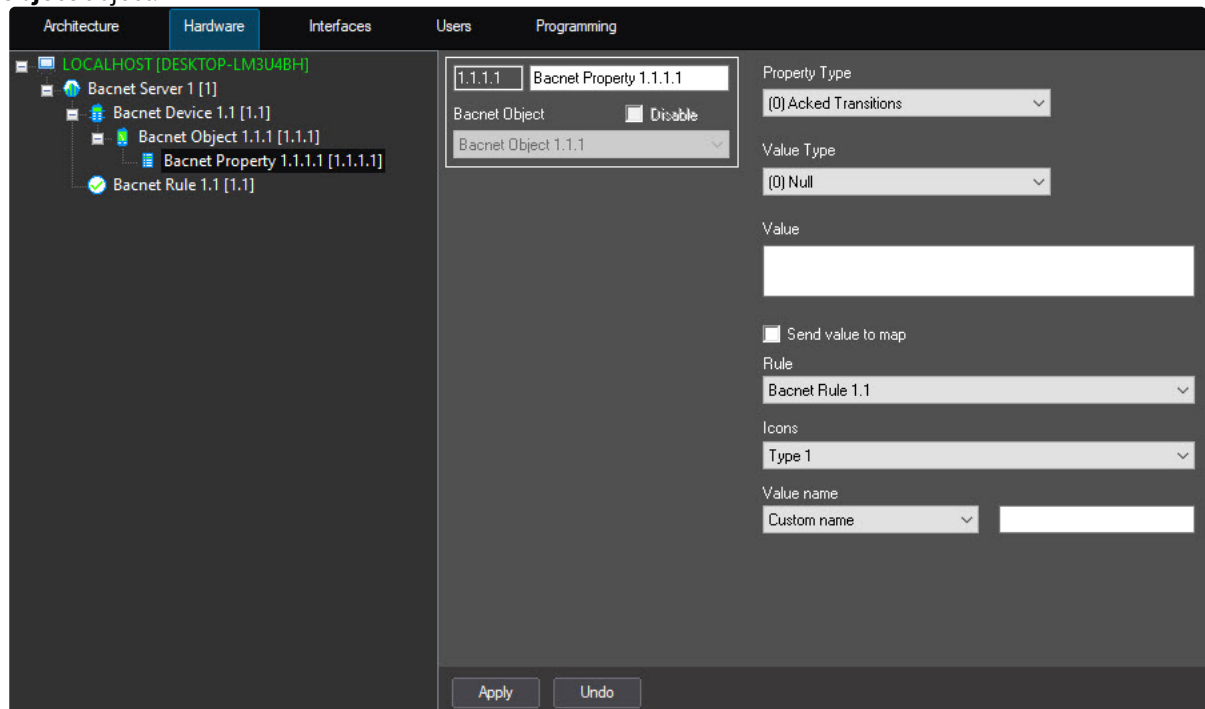
Select the **Read properties (not recommended)** subscription method only if the standard subscription method doesn't work.

Configuration of the *BACnet* object is complete.

4.4 Configuring the BACnet Property

To configure the property of the *BACnet* channel, do the following:

1. Go to the settings panel of the **Bacnet Property** object that is created on the basis of the **Bacnet Object** object.



2. From the **Property Type** drop-down list, select the type of the property that will be sent and stored on the device.
3. From the **Value Type** drop-down list, select the data type that will be used to send and store the property on the device.
4. In the **Value** field, specify the default value of the property.
5. Set the **Send value to map** checkbox to display the property value on the map.
6. From the **Rule** drop-down list, select the rule for processing property values. For details on rules configuration, see [Configuring rules for the BACnet property](#).
7. From the **Icons** drop-down list, select the icons preset that will be used to indicate the property on the map. For details, see [Managing the property of the BACnet channel on the map](#).
8. From the **Value name** drop-down list, select the value that will be displayed on the map when the property is displayed in text form:
 - **Value**—value of the channel property.
 - **Axxon PSIM name**—name of this object in *Axxon PSIM*.
 - **Custom name**—custom value. If the **Custom name** is selected, a blank field will be displayed in which it is necessary to enter the corresponding value.

Note

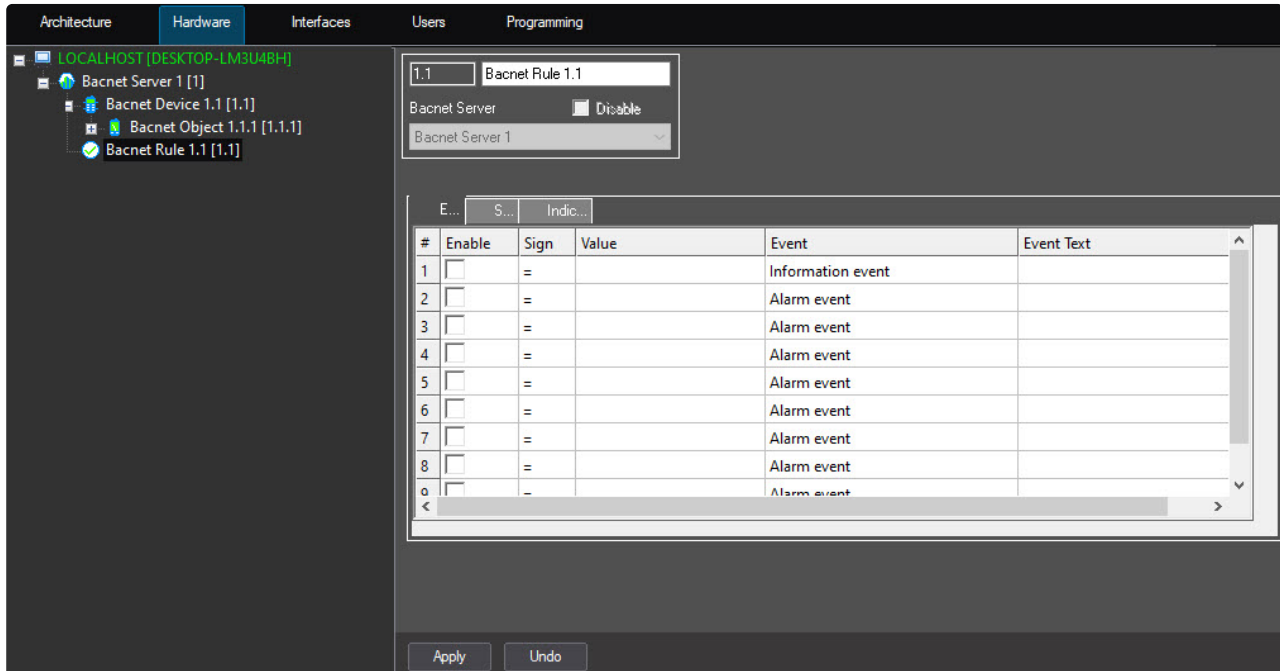
The display on the map will be changed as soon as a new value of channel property is received.

9. Click the **Apply** button.

Configuration of properties of the *BACnet* channel is complete.

4.5 Configuring rules for the BACnet property

Rules allow you to create events, change system states or indicator states when a property accepts a value from a certain range. You can configure rules on the settings panel of the **Bacnet Rule** object that is created on the basis of the **Bacnet Server** object.



This object is a group of rules that can include rules of any type. Only one group of rules can be assigned to each BACnet property and channel.

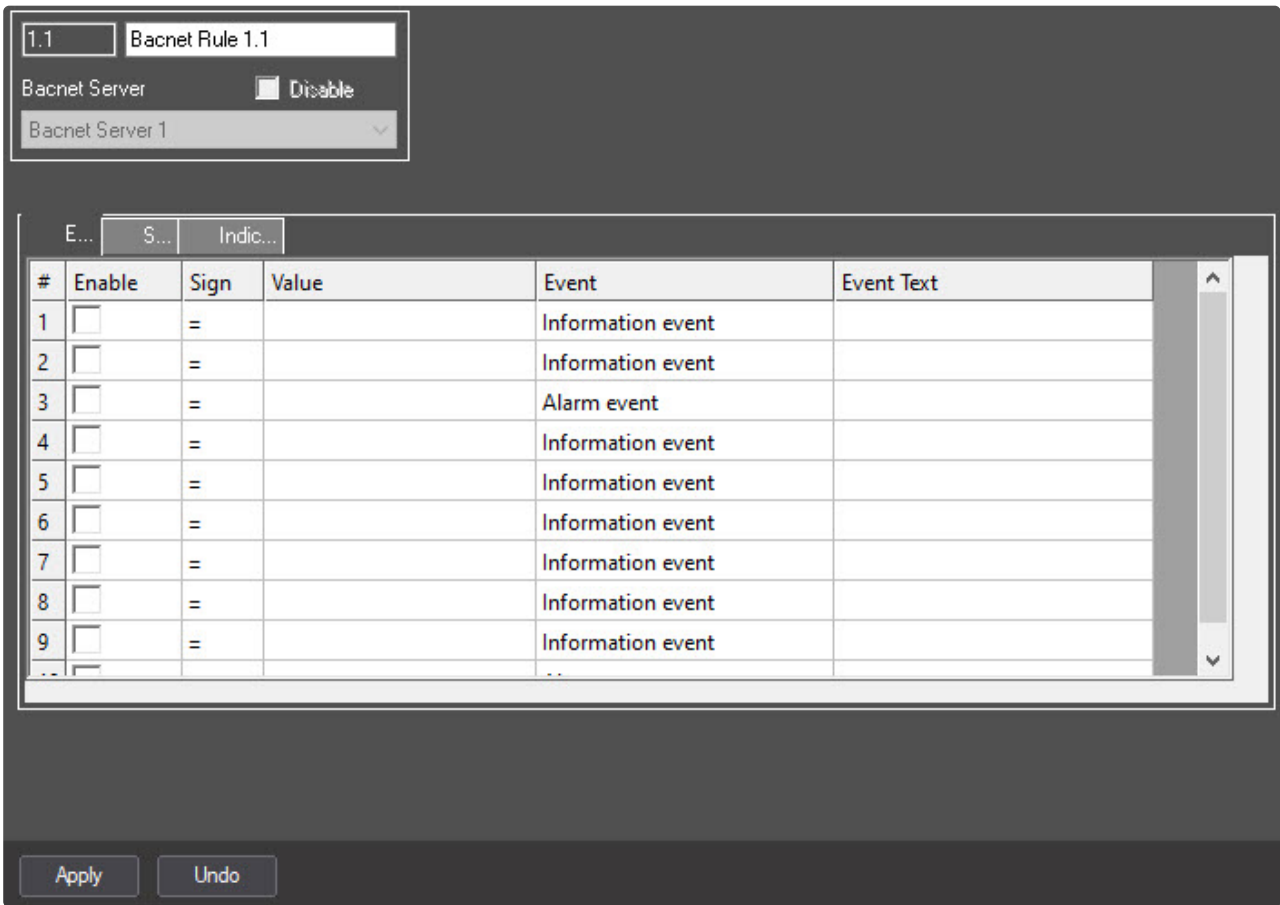
4.5.1 Configuring rules of event generation

Rules of event generation allow you to create events if a value of a property falls into a given range.

To configure these rules, set the following parameters on the **Events** tab on the settings panel of the **Bacnet Rule** object:

1. Set the **Enable** checkbox to activate the rule.
2. From the drop-down list in the **Sign** column, select the sign that determines the range. The list of recognized signs differs for each supported data type, see the table below.
3. In the **Value** column, enter the property value that limits the range. The value must match the formatting rules for the data type of the BACnet property, for which the rule is configured, see [Configuring the BACnet Property](#) and the table below.
4. From the drop-down list in the **Event** column, select an event that will be generated.
5. In the **Event text** column, enter the message that will be displayed when the property value falls in the specified range.
6. Click the **Apply** button to save the changes.

You can specify up to 10 rules.



Signs available for different data types are listed in the table below:

Data type	Formatting	Signs
Boolean	NA	=, !=
Unsigned Int	NA	=, !=, <, >, <=, >=
Signed Int	NA	=, !=, <, >, <=, >=
Real	Both "." and "," can be used	=, !=, <, >, <=, >=
Double	Both "." and "," can be used	=, !=, <, >, <=, >=
Octet String	NA	=, !=
Character String	NA	=, !=
Bit String	NA	=, !=

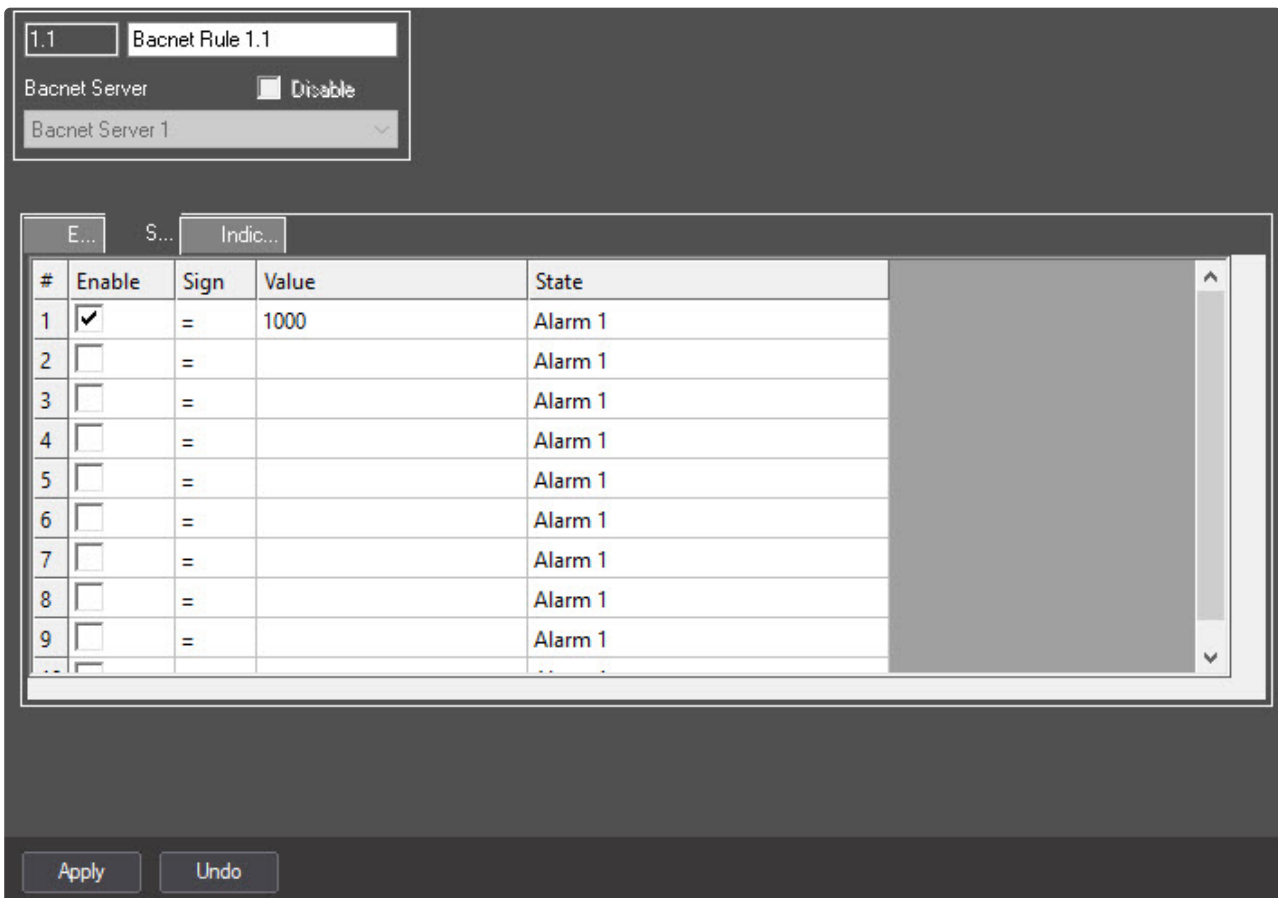
Data type	Formatting	Signs
Enumerated	In fact it is Unsigned Int	=, !=
Date	Example: 2.3.2001, 01.01.1988	=, !=, <, >, <=, >=
Time	Example: 3:4:6, 03:04:06, 13:24:56	=, !=, <, >, <=, >=

4.5.2 Configuring rules of system state change

Rules of system states change allow you to create new system states if a value of a property falls in a given range.

To configure these rules, set the following parameters on the **States** tab on the settings panel of the **Bacnet Rule** object:

1. Set the **Enable** checkbox to activate the rule.
2. From the drop-down list in the **Sign** column, select the sign that determines the range. The list of recognized signs differs for each supported data type, see the table in [Configuring rules of event generation](#).
3. In the **Value** column, enter the property value that limits the range. The value must match the formatting rules for the data type of the *BACNet* property, for which the rule is configured, see [Configuring the BACnet Property](#).
4. From the drop-down list in the **State** column, select a state that will be generated.
5. Click the **Apply** button to save the changes.



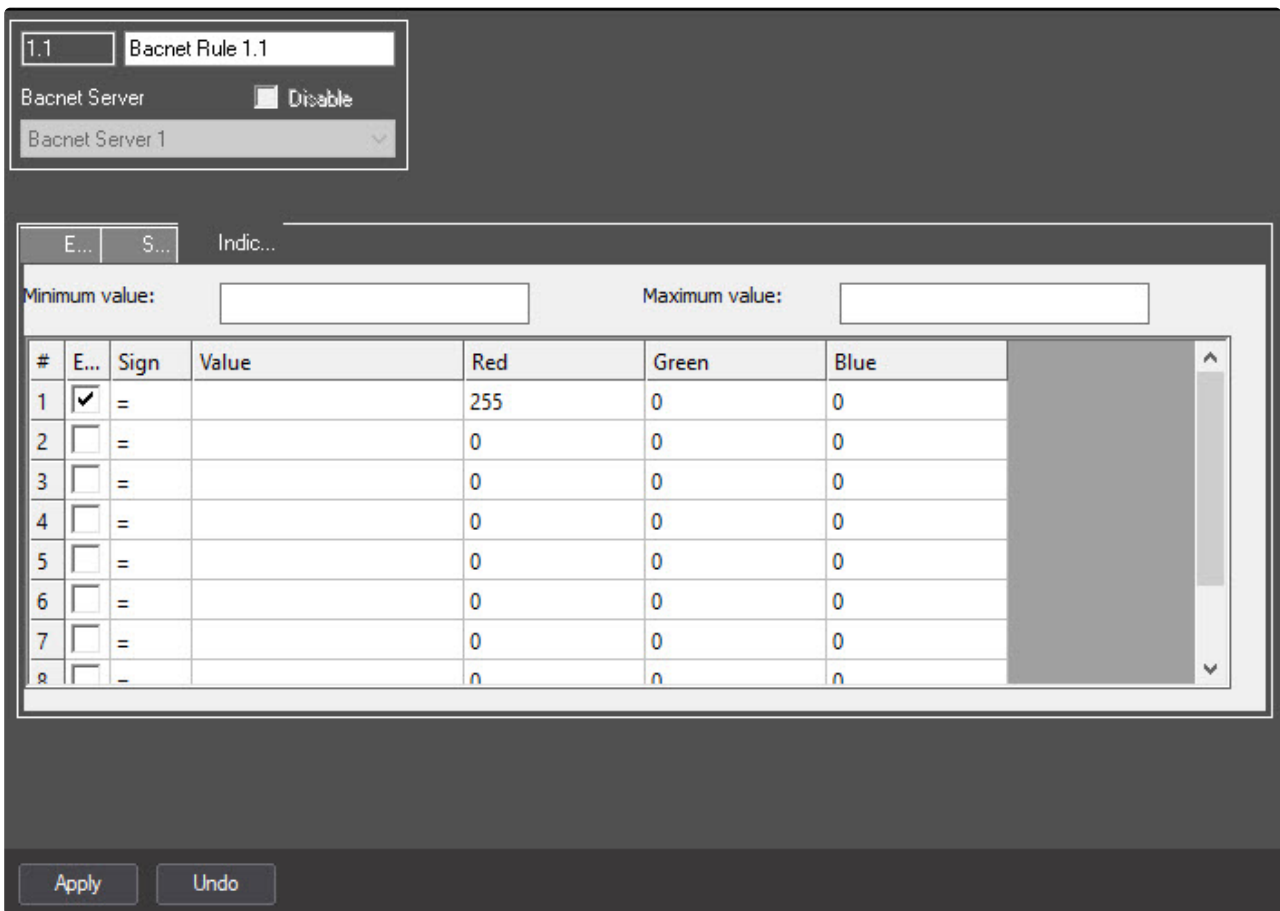
4.5.3 Configuring rules of indicator state change

Rules of indicator state change allow you to change the indicator of the *BACnet* object on the map if a value of a property falls in a given range.

The indicator and property value are displayed on the map (see [Managing the property of the BACnet channel on the map](#)).

To configure these rules, set the following parameters on the **Indicators** tab on the settings panel of the **Bacnet Rule** object:

1. Set the **Enable** checkbox to activate the rule.
2. From the drop-down list in the **Sign** column, select the sign that determines the range. The list of recognized signs differs for each supported data type, see the table below.
3. Determine a value of a property in one of the following ways:
 - a. In the **Value** column, enter the property value that limits the range. The value must match the data type of the *BACnet* property, for which the rule is configured, see [Configuring the BACnet Property](#).
 - b. In the **Minimum value** and **Maximum value** fields, specify the interval the value must fall into.
4. In the **Red**, **Green** and **Blue** columns, specify the color of the indicator according to the RGB model.
5. Click the **Apply** button to save the changes.



You can specify up to 10 states of the indicator.

⚠ Attention!

If the value of the property falls into several intervals, the indicator will take the color according to the rule with the lowest order number.

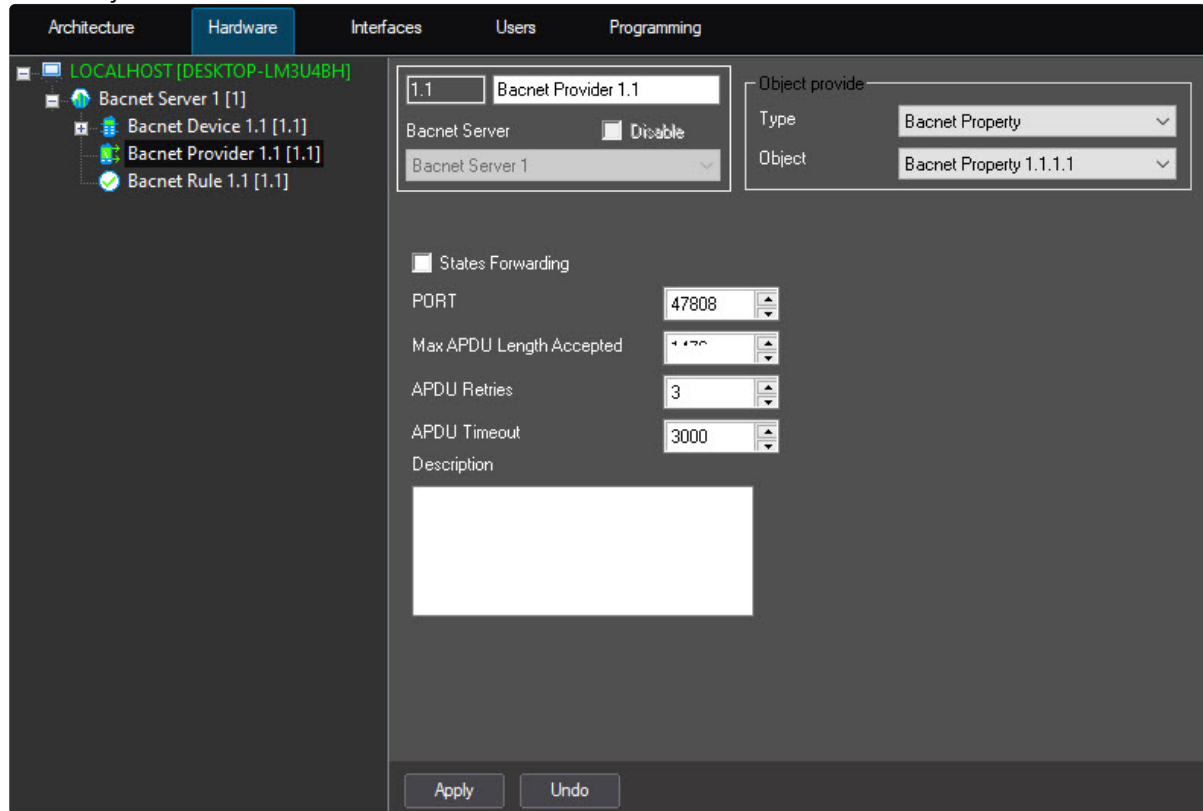
The signs available for different data types are listed in the table below:

Type	Signs
Unsigned Int	=, !=, <, >, <=, >=
Signed Int	=, !=, <, >, <=, >=
Real	=, !=, <, >, <=, >=
Double	=, !=, <, >, <=, >=

4.6 Configuring the BACnet Provider

To configure the *BACnet* provider, do the following:

1. Go to the settings panel of the **Bacnet Provider** object that is created on the basis of the **Bacnet Server** object.



2. From the **Type** drop-down list, select the required type of object in *Axxon PSIM*.
3. From the **Object** drop-down list, select the required object in *Axxon PSIM*.
4. Set the **States Forwarding** checkbox to forward the states of an object to *Axxon PSIM*.
5. In the **PORT** field, enter the port within the BACnet network.
6. In the **Max APDU Length Accepted** field, enter the maximum number of octets (eight binary digits) depending on the type of connection (Bacnet IP, Bacnet MS/TP, and so on).
7. In the **APDU Retries** field, enter the number of attempts to receive the events and/or parameters from an object in case the request was unsuccessful.
8. In the **APDU Timeout** field, enter the time interval in milliseconds, after which an attempt will be made to re-request if the previous attempt was unsuccessful. Also, this time specifies the COV polling period.

Note

COV is COV Subscriptions, that is, subscription to objects of the BACnet device, in this case, it is a subscription to the *Axxon PSIM* object. The *BACnet* server waits for the notification about the events and/or *Axxon PSIM* object parameter changes in order to forward them.

9. In the **Description** field, enter the description of the forwarded data, if necessary.
10. Click the **Apply** button to save the changes.

The *BACnet* provider configuration is now complete.

5 Working with the BACnet Wrapper integration module

5.1 General information about working with the BACnet Wrapper integration module

The events from the *BACnet* devices are sent to the *Event Viewer*.

The icon and indicator states and the values of the *BACnet* parameter or channel are displayed on the map.

The information on configuring the **Event Viewer** and the **Map** interface objects is given in [Administrator's Guide](#).

The information on working with the **Event Viewer** and the **Map** interface objects is given in [Operator's Guide](#).

You can configure reactions to some values of elements using scripts and macros. The information on working with scripts and macros is described in [Guide for creating scripts \(programming\)](#) and [The Script object. Programming using the JScript language](#).



Note

The current versions of all the above documents are stored in the [AxxonSoft documentation repository](#).

5.2 Managing the BACnet Server

You cannot manage the *BACnet* Server in the **Map** window.



The *BACnet* Server can have the following states:

	Connection with device is established
	Connection breakdown

5.3 Managing the BACnet Device

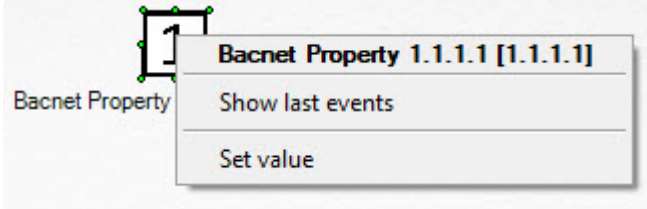
You cannot manage the *BACnet* Device in the **Map** window.

The *BACnet* Device can have the following states:

	Connection is established
	Connection is lost

5.4 Managing the property of the BACnet channel on the map

You can manage a property of the *BACnet* channel in the **Map** window using the menu of the **Bacnet Property** object:




Command for managing a property of the *BACnet* channel is described in the table:

Command	Function performed
Set value	Displays a window in which the value of the channel property is set

Property of the *BACnet* channels can be added to the map in the following forms:

As an icon of a state	Bacnet Property 1.1.1.1 [1.1.1.1]
As an icon of a state and an indicator	Bacnet Property 1.1.1.1 [1.1.1.1]
As a text (parameter value)	Bacnet Property 1.1.1.1 [1.1.1.1] Value: =44
As a graphic indicator of a state—a line	Bacnet Property 1.1.1.1 [1.1.1.1]
As a graphic indicator of a state—a polygon	Bacnet Property 1.1.1.1 [1.1.1.1]

As a graphic indicator of a state—an ellipsis	Bacnet Property 1.1.1.1 [1.1.1.1] 
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Note

You can select the type of object display on the map when adding it (see [Operations with objects in the Map editor utility](#)).