SNMP Wrapper Settings Guide

ACFA PSIM 1.1

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1 Introduction into SNMP Wrapper Settings Guide

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1.1 Purpose of the document

The *SNMP Wrapper integration module settings guide* provides comprehensive setup and operational guidance for *SNMP Wrapper* module operators.
This Guide presents the following materials:

1. General information about the *SNMP Wrapper* module.
2. *SNMP Wrapper* module settings.
3. Working with the *SNMP Wrapper* module.

1.2 General information about the SNMP Wrapper integration module

SNMP Wrapper integration module enables data exchange and event receiving using SNMP traps v.1, v.2 and v.3.

Note

Furthermore, base *Axxon PSIM* allows configuring SNMP-service for resending messages about the registered events to SNMP-manager — see Configuring the SNMP-service section of the *Axxon PSIM* software package. Administrator's Guide. The most relevant version of this document is available at AxxonSoft documentation repository.

2 Licensing and systems supported by SNMP Wrapper

SNMP Wrapper is licensed for 1 channel.

> **Note**
>
> 1 channel corresponds to 1 SNMP trap sent by the device when an event occurs. As a rule, one event equals one SNMP trap, but some devices send several SNMP traps with different data per event. For example, the UPS generates a Power Failure event and sends two SNMP traps “No External Power” and “Current Charge Level”. Therefore, to determine the number of licenses, it is necessary to clarify the required list of SNMP traps in the official documentation of the device manufacturer.

Systems which operation is guaranteed by *SNMP Wrapper* universal integration are as follows:

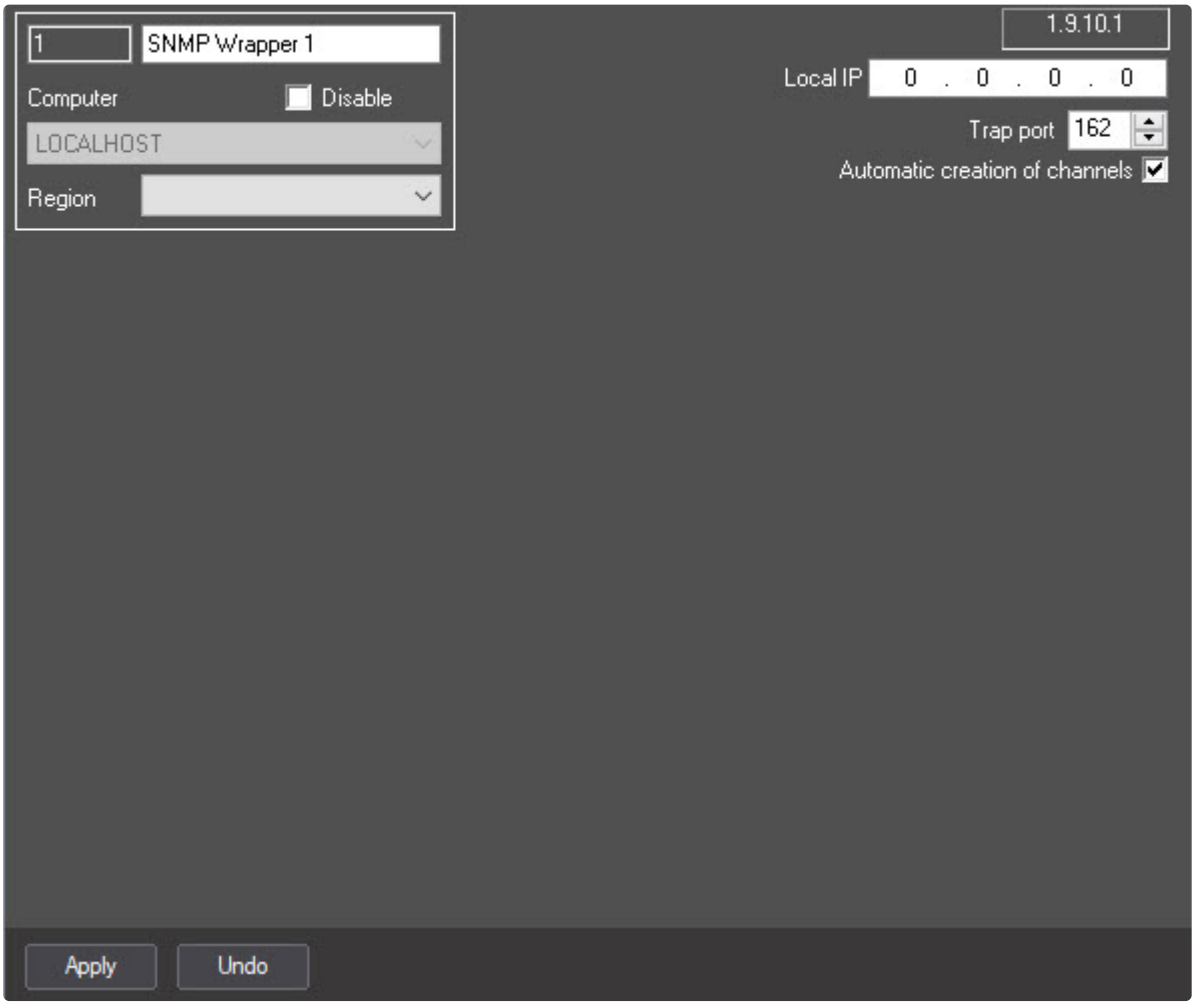
Name	Functionality in the Axxon PSIM software package	Comment
AVTECH - Room Alert 24E- Alarm Switch	Monitoring of the following events: • Humidity is out-of-bounds; • Humidity is within borders; • Cabinet open; • Cabinet close; • Temp is out-of-bounds; • Temp is within bounds; • Power loss; • Power connected.	The license is per sensor (e.g. Internal Humidity Sensor, Power Sensor, etc.)
MOXA Remote I/O Series cards of any type: Ethernet I/O, RS-485 I/O or Modular I/O (for the list of all cards which can be connected by the SNMP please refer here)	Receive the current state of connected sensors.	The license is per sensor connected to input, i,e, the number of licenses is equal to the number of inputs used.
NAG SNR-ERD	Receiving status and events from controller elements, for example, temperature sensors, relay status (on, off)	
TFortis	Device status poll.	

3 Configuration of the SNMP Wrapper integration module

3.1 Activating the SNMP Wrapper integration module

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

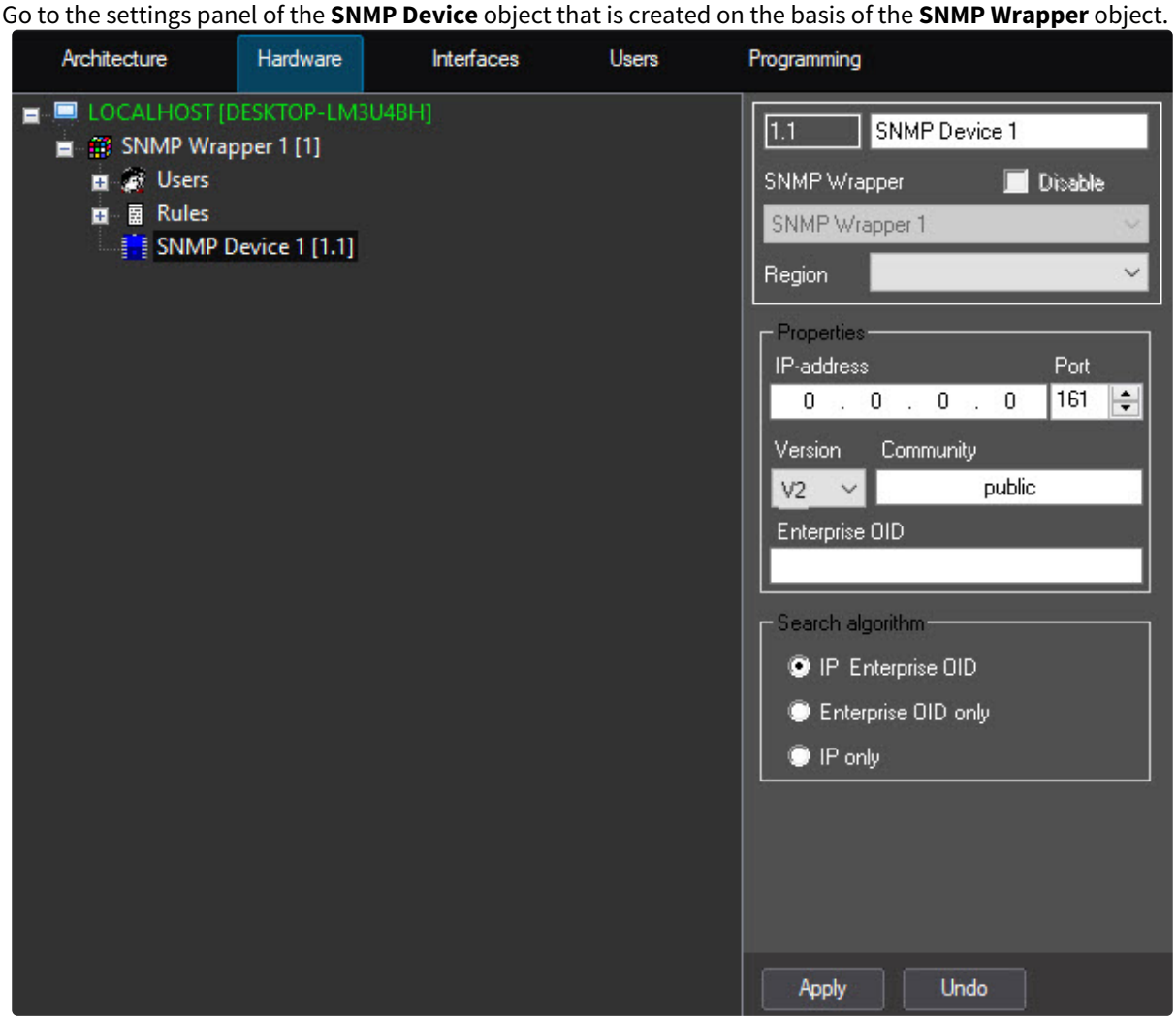
On the settings panel of the **SNMP Wrapper** object, in the **Local IP** field, enter the local IP address of the *Axxon PSIM* Server and click the **Apply** button.



3.2 Connecting a device via the SNMP protocol

To configure the device connection via the SNMP protocol, do the following:

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



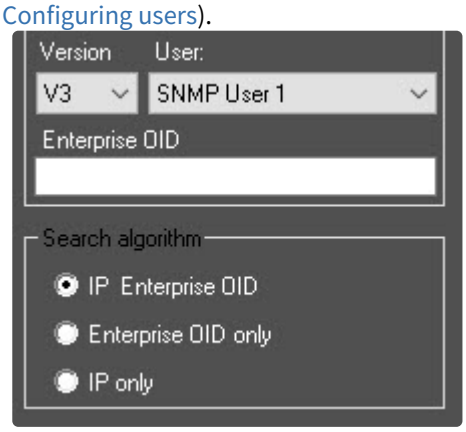
2. In the **IP address** field, specify the IP address of the device.
3. In the **Port** field, specify the connection port of the device.
4. From the **Version** drop-down list, select the version of the SNMP protocol of the connected device.

> **Note**
>
> You must select the version of the SNMP protocol according to the technical requirements of the connected device (see official reference documentation for the device).

   a. For the **V1** and **V2** versions of the protocol, in the **Community** field, specify the group membership password.

> **Note**
>
> The default **Community** values are public and private for read or read-write permissions, respectively.

b. For the **V3** version of the protocol, from the **User** drop-down list, select the required user (see Configuring users).



5. In the **Enterprise OID** field, enter the device identification number.
6. In the **Search algorithm** section, select:
   a. **IP Enterprise OID** to use the device's IP address and ID to search for the device.
   b. **Enterprise OID only** to use only the device's ID to search for the device.
   c. **IP only** to use only the device's IP address to search for the device.
7. Click the **Apply** button to save the changes.

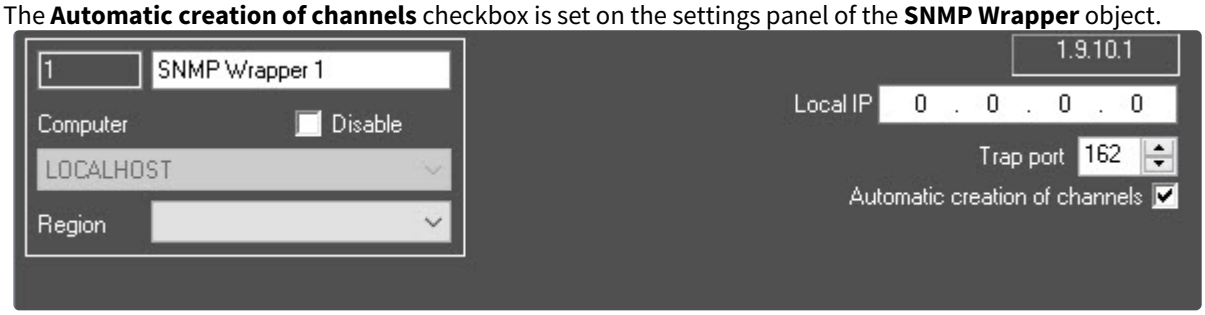
Connecting a device via the SNMP protocol is complete.

3.3 Automatic creation of channels in Axxon PSIM

After receiving an SNMP trap (a special signal sent by a device that supports the SNMP protocol. The signal notifies about the occurrence of critical events), channels described by the trap can be automatically created in *Axxon PSIM*.

Two conditions must be met in order for this to happen:

1. The **Automatic creation of channels** checkbox is set on the settings panel of the **SNMP Wrapper** object.



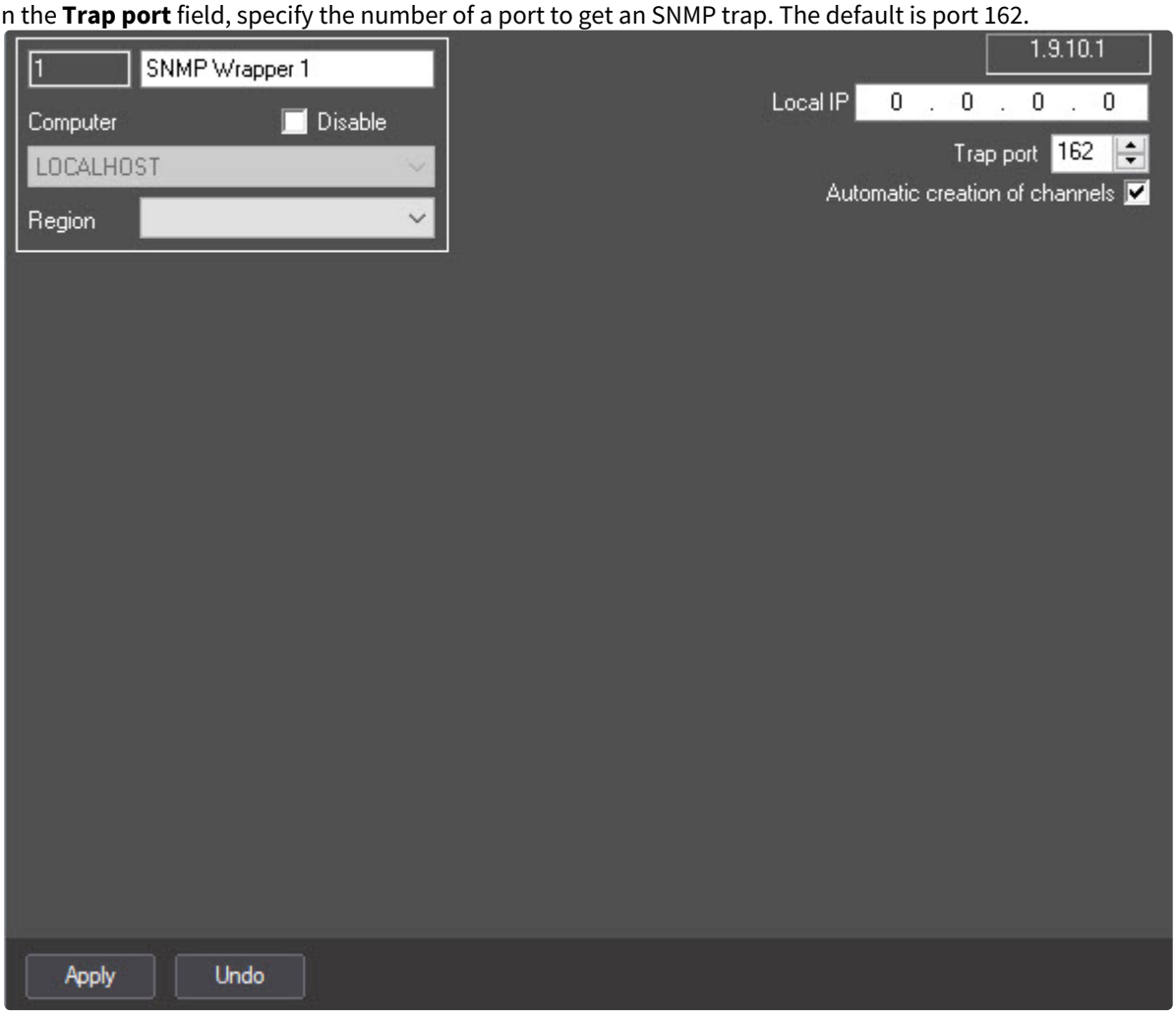
2. Connection with a device is established (see Connecting a device via the SNMP protocol).

If these conditions are met, the corresponding channels are created after receiving an SNMP trap.

3.4 Selecting a port to get an SNMP trap

You can select a port to get an SNMP trap on the settings panel of the **SNMP Wrapper** object. For this, do the following:

1. In the **Trap port** field, specify the number of a port to get an SNMP trap. The default is port 162.



2. Click the **Apply** button to save the settings.

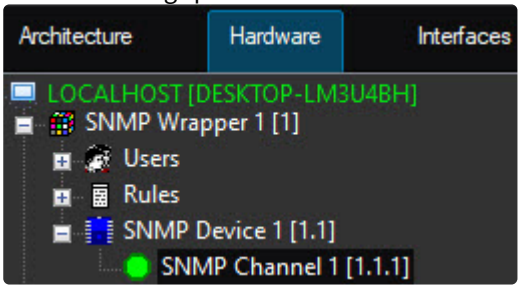
Selecting a port to get an SNMP trap is complete.

3.5 Configuring channels of a device

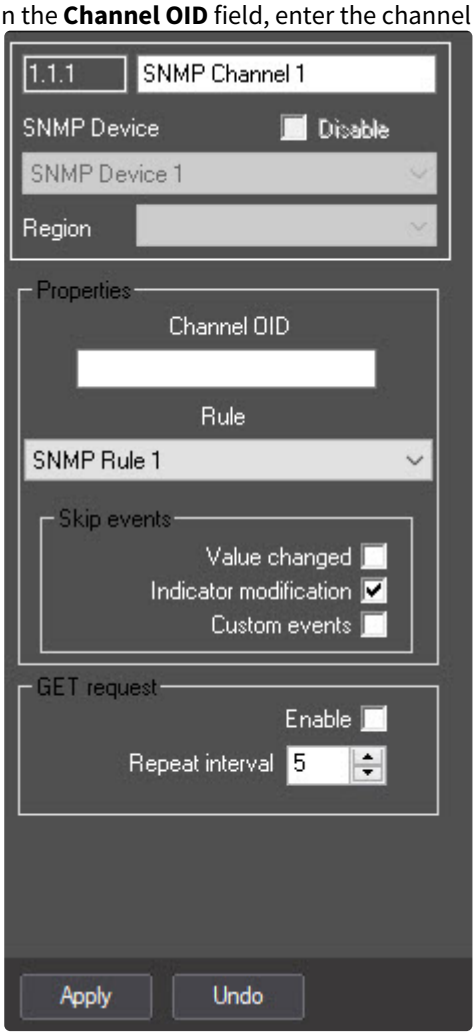
The device state is described by a specific number of variables-channels. A channel can have both a digit and a string value.

To configure a channel, do the following:

1. Go to the settings panel of the **SNMP Channel** object created on the basis of the **SNMP Device** object.



2. In the **Channel OID** field, enter the channel ID.



> **Note**
>
> You must enter the value of channel ID without the value of device ID.

3. If necessary, select a **Rule** with which the channel will comply (see Configuring rules).
4. From the **Type** drop-down list, select data type:
Null, **OctetString**, **Integer**, **OID**, **Gauge**, **Counter32**, **IpAddress**, **TimeTicks**, **Counter64**, **UnsignedInteger**, **Opaque (Float)**, **Opaque (Double)**.
5. Set the **Value chaged** checkbox if you don't want to display events about the channel value change in the *Event Viewer*.
6. Clear the **Indicator modification** checkbox if you want to display the channel value on the map in text form.

> **Attention!**
>
> Changed values of this parameter are applied after you restart the *Axxon PSIM* Server.

7. Set the **Custom events** checkbox if you don't want to display events in the *Event Viewer* when a rule triggers.
8. In the **GET request** group, set the **Enable** checkbox to enable GET requests.
9. In the **Repeat interval** field, specify the time in seconds after which GET requests are sent.
10. Click the **Apply** button to save the changes.

Device channel configuration is now completed.

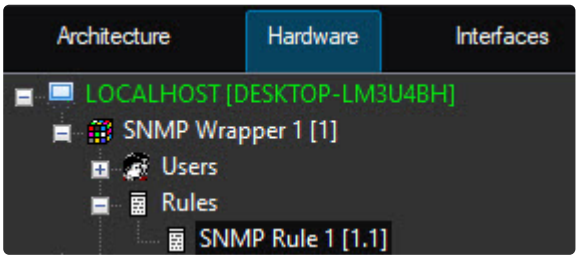
3.6 Configuring rules

Rules change the state of channels on the map depending on their values and/or generate an event.

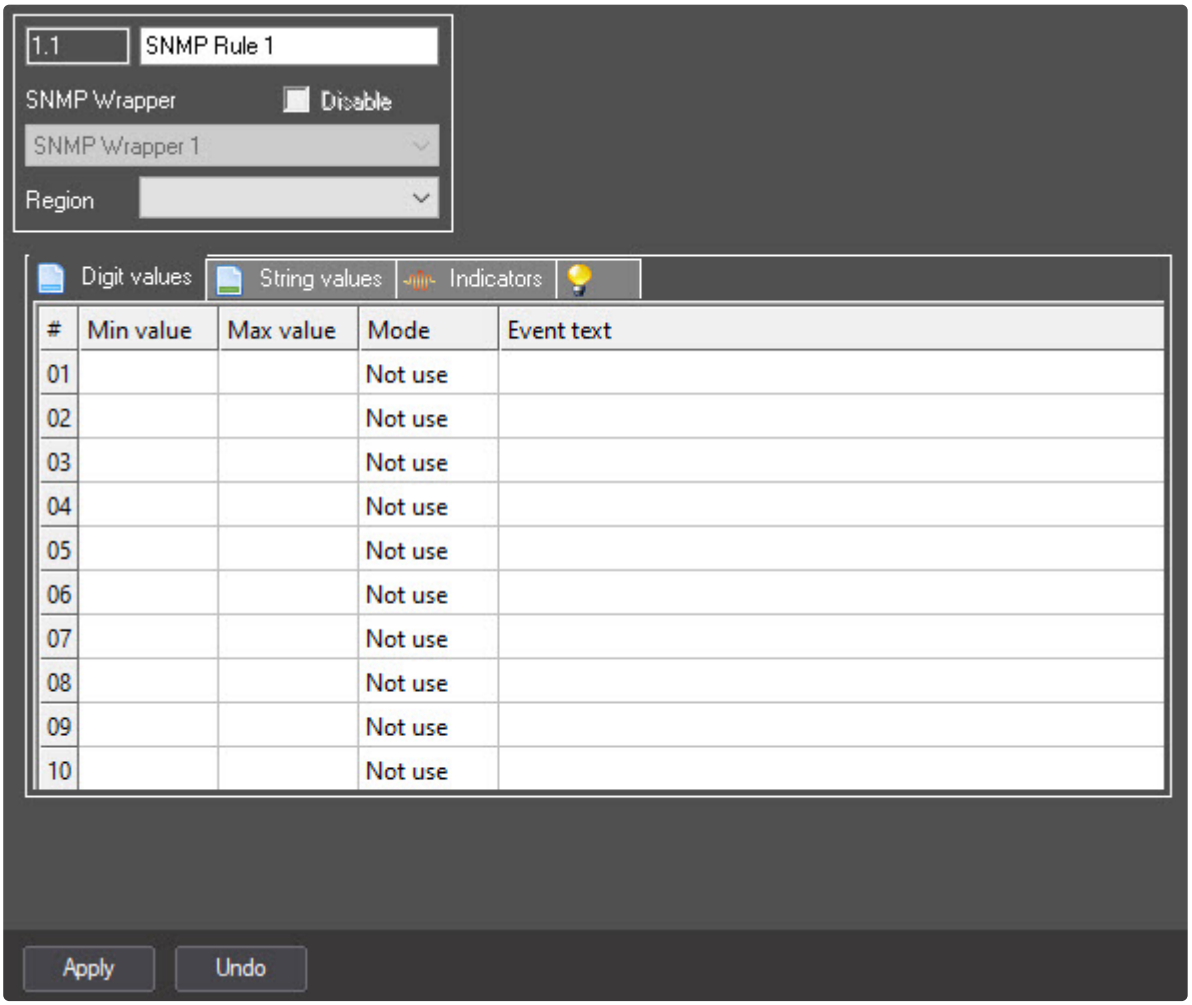
If a channel has a digit value, you can change the state of an indicator when a channel takes a value from a specific range.

You can set up to 10 conditions in each rule. Each condition corresponds to one state on the map (see Working with device channels on the map).

You can configure rules on the settings panel of the **SNMP Rule** object created on the basis of the **SNMP Wrapper** object.



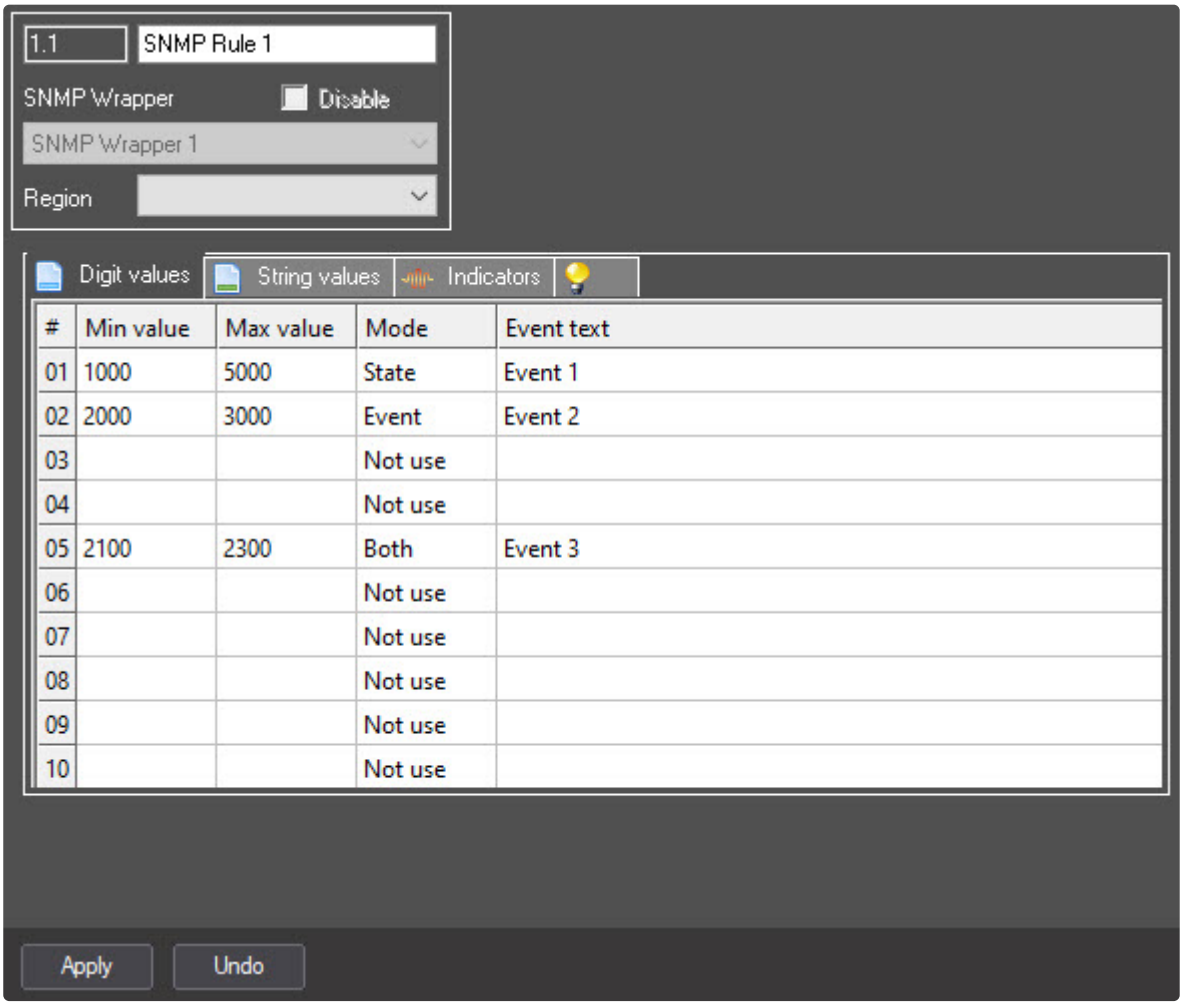
You can configure the conditions for digit values of channels on the **Digit values** tab. You can configure the conditions for string values of channels on the **String values** tab. You can configure conditions for changing the state of indicators on the **Indicators** tab. You can configure conditions for performing the required action on the **Actions** tab.



3.6.1 Setting conditions for channels with digit values

You can set conditions for channels with digit values on the **Digit values** tab:

1. In the **Min value** and **Max value** columns, specify the channel interval of values.



#	Min value	Max value	Mode	Event text
01	1000	5000	State	Event 1
02	2000	3000	Event	Event 2
03			Not use	
04			Not use	
05	2100	2300	Both	Event 3
06			Not use	
07			Not use	
08			Not use	
09			Not use	
10			Not use	

> **Attention!**
>
> If the value of a channel falls into multiple intervals, then the channel is in multiple states (multistate) and/or receives multiple events.

2. In the **Mode** column, select an action that happens when a channel accepts a value from a specified interval.

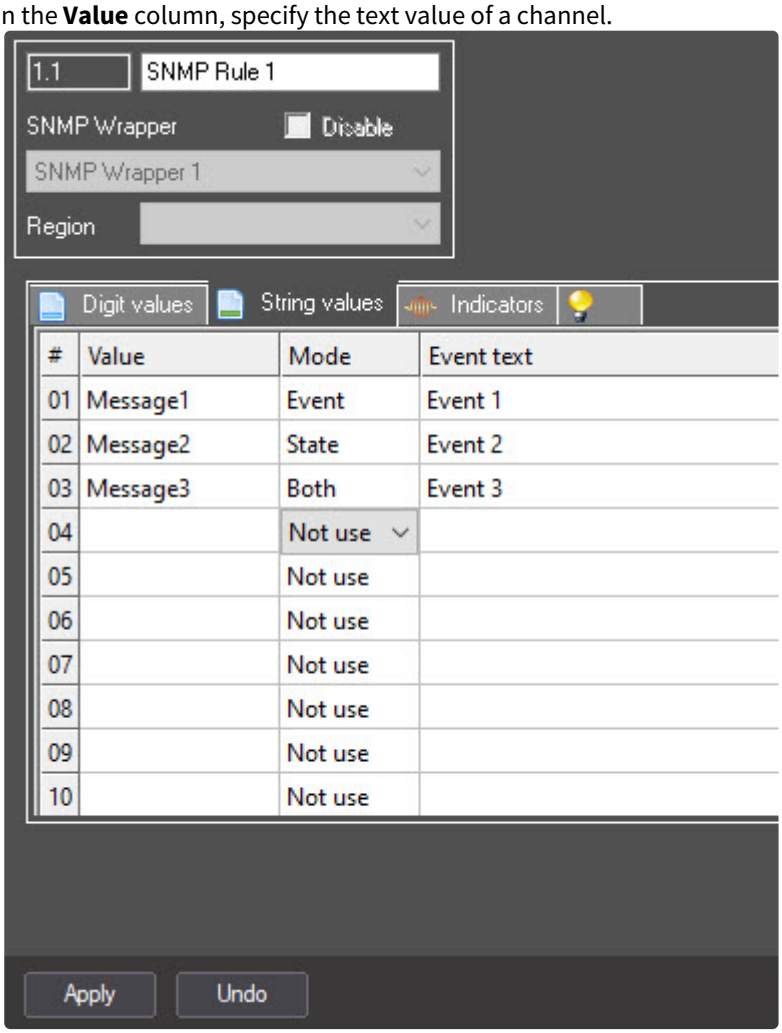
State	Channel state change on the map
Event	Event generation
Both	Channel state change and event generation

3. In the **Event text** column, enter a message that is sent when a channel accepts a value from a specified interval.
4. Click the **Apply** button.

3.6.2 Setting conditions for channels with string values

You can set conditions for channels with string values on the **String values** tab:

1. In the **Value** column, specify the text value of a channel.



#	Value	Mode	Event text
01	Message1	Event	Event 1
02	Message2	State	Event 2
03	Message3	Both	Event 3
04		Not use	
05		Not use	
06		Not use	
07		Not use	
08		Not use	
09		Not use	
10		Not use	

2. In the **Mode** column, select an action that happens when a channel accepts a specified value.

State	Channel state change on the map
Event	Event generation
Both	Channel state change and event generation

3. In the **Event text** column, enter a message that is sent when a channel accepts a specified value.
4. Click the **Apply** button.

3.6.3 Conditions for changing the state of indicator

You can set the conditions for changing the state of indicator on the **Indicators** tab on the settings panel of the **SNMP Rule** object. Description of parameters is presented in the following table. You can specify up to 10 states of indicator.

Parameter	Parameter description

Rule #	Serial number of a condition
V. min, V. max	Range of channel values for a condition
S. min, S. max	Range of values which indicator will take according to the rule
Use	Activate the interval
Red, Green, Blue	Specify the color of indicator by the RGB model

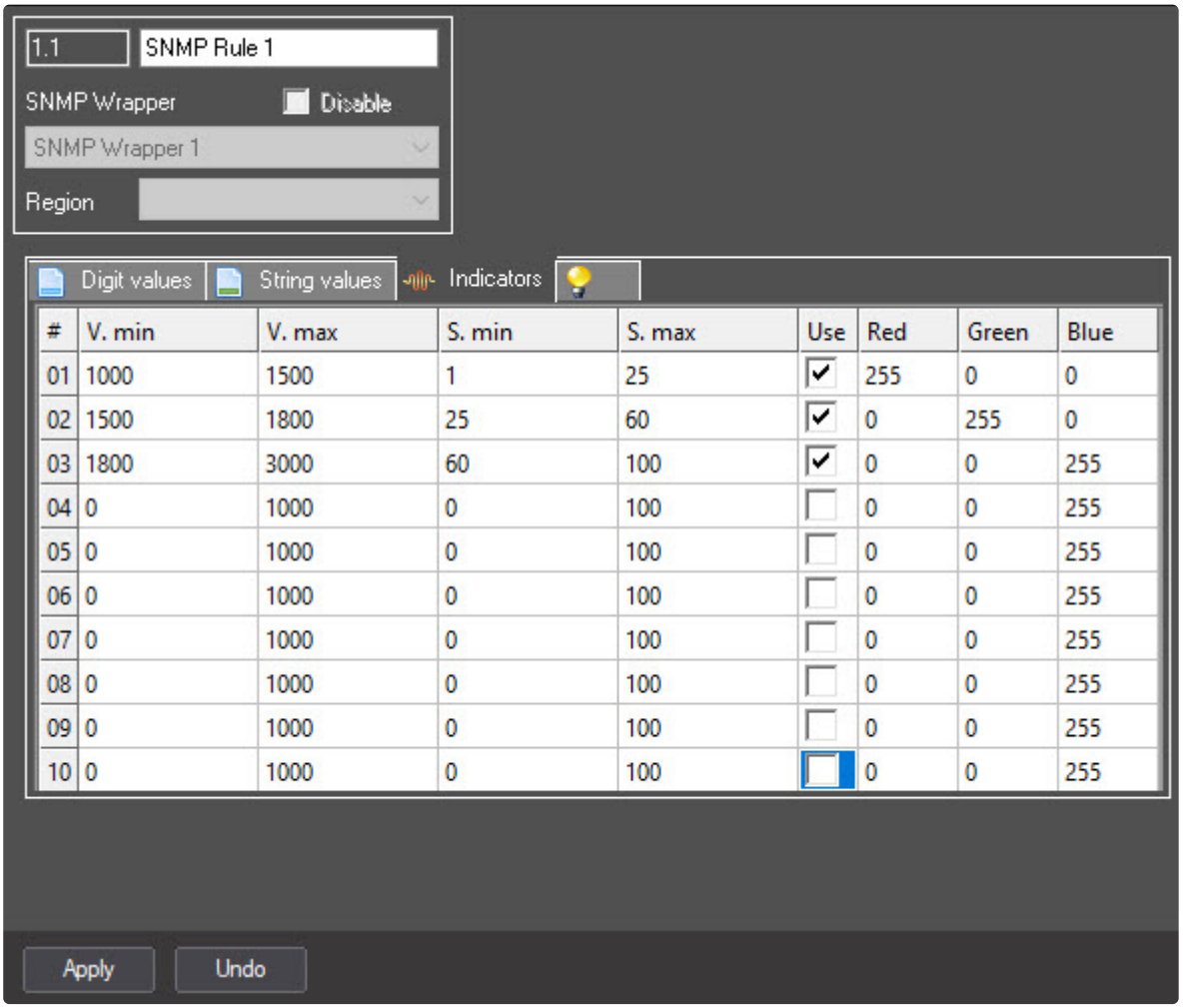
Attention!

If the value of a channel falls into multiple intervals, then the indicator accepts the value according to the condition with the smallest serial number from the suitable ones.

To save the changes, click the **Apply** button.

Indicator and its value are displayed on the map (see Working with device channels on the map).

Let's consider the work of this rule on an example.



#	V. min	V. max	S. min	S. max	Use	Red	Green	Blue
01	1000	1500	1	25	✓	255	0	0
02	1500	1800	25	60	✓	0	255	0
03	1800	3000	60	100	✓	0	0	255
04	0	1000	0	100		0	0	255
05	0	1000	0	100		0	0	255
06	0	1000	0	100		0	0	255
07	0	1000	0	100		0	0	255
08	0	1000	0	100		0	0	255
09	0	1000	0	100		0	0	255
10	0	1000	0	100		0	0	255

There are three intervals of channel values depending on which the indicator takes a certain proportional value and color. To count the correct value of the indicator, the following formula is used:

$$S = \frac{(V - V.min)(S.max - S.min)}{V.max - V.min} + S.min$$

where V is exact value of an element.

For example, if the channel takes the value V=1300, then the indicator value

$$S = \frac{(1300-1000)(25-0)}{1500-1000} + 0 = 15$$

its color is red.

If the channel takes the value V=2200, then the indicator value

$$S = \frac{(2200-1800)(100-60)}{3000-1800} + 60 = 73$$ (approximated)

its color is blue.

3.6.4 Setting conditions for performing actions for a channel

You can set conditions for a channel on which certain actions will be performed on the **Actions** tab on the settings panel of the **SNMP Rule** object.

Description of parameters is given in the table. You can set up to 10 conditions.

Parameter	Parameter description
Rule #	Serial number of an action condition
Value	Value of a channel for performing an action
Use	Activation of an action condition
Action	Action that occurs when a channel accepts the specified value

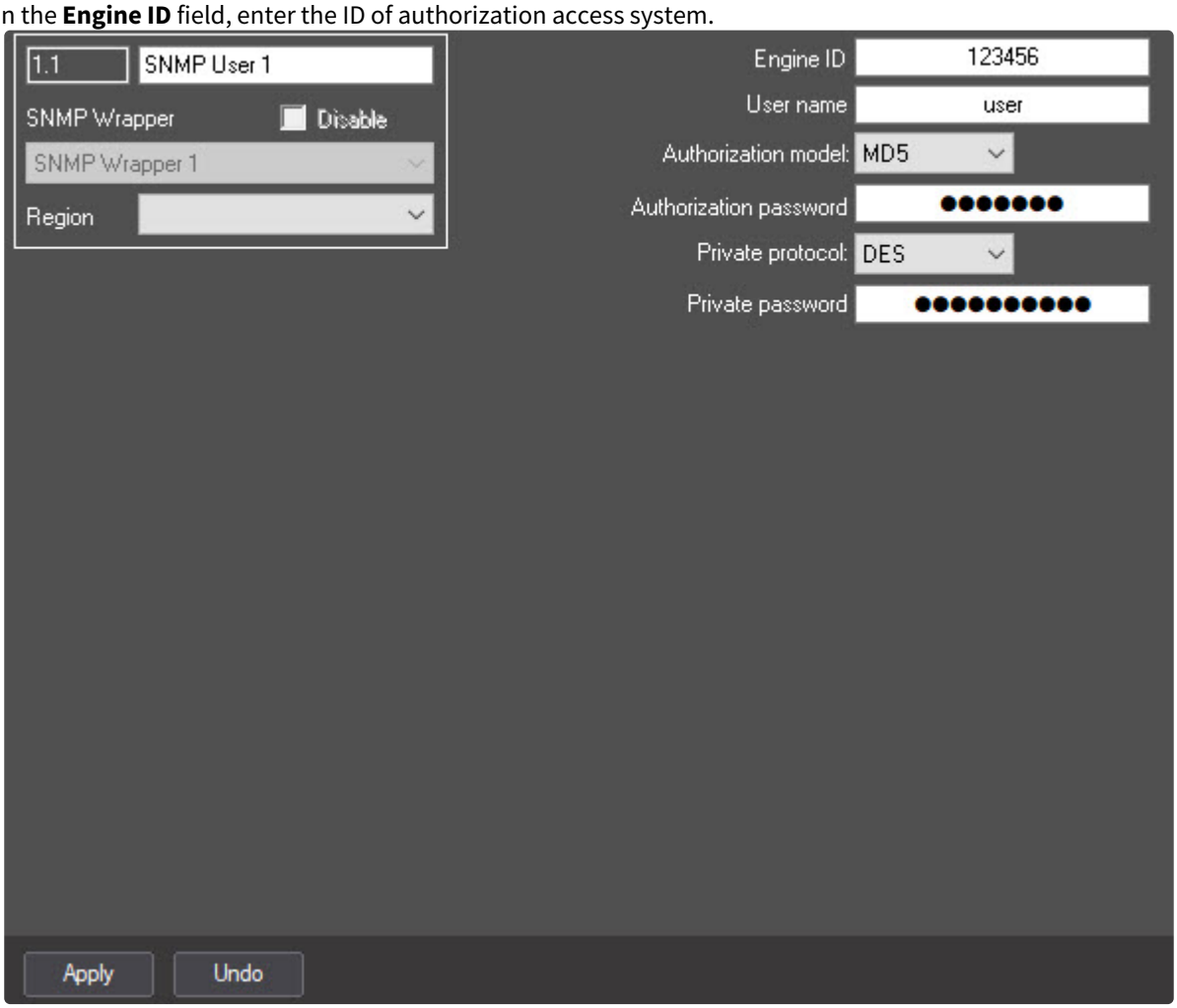
3.7 Configuring users

To use SNMP-traps v.3, you must configure users.

You can configure users on the settings panel of the **SNMP User** object created on the basis of the **SNMP Wrapper** object.

To configure users, do the following:

1. In the **Engine ID** field, enter the ID of authorization access system.



2. In the **User name** field, enter user name for authorization.
3. From the **Authorization model** drop-down list, select the required hashing algorithm.
4. In the **Authorization password** field, enter password for authorization.
5. From the **Private protocol** drop-down list, select the encryption algorithm for user data.
6. In the **Private password** field, enter the password for data encryption.
7. Click the **Apply** button to save the changes.

User configuration is now completed.

4 Working with SNMP Wrapper integration module

4.1 General information on Working with SNMP Wrapper integration module

Events of *SNMP Wrapper* elements are sent to the *Events protocol*.

Icon, value and indicator of the channel state can be displayed on the map.

Information on how to configure the **Events protocol** and **Map** interface objects is given in details in the *Axxon PSIM* software package. Administrator's Guide document.

Information on how to work with **Events protocol** and **Map** interface objects is given in details in the *Axxon PSIM* software package. Operator's Guide document.

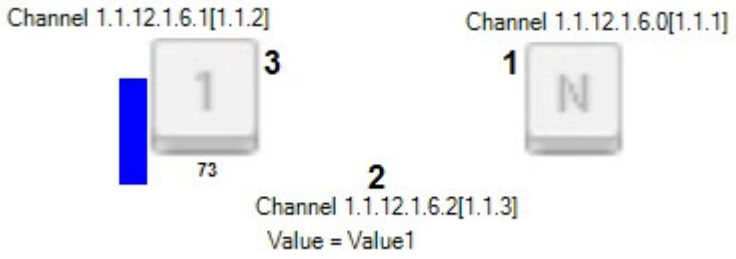
It is possible to configure reactions to some values of elements with the help of scripts and macros. Information on how to work with scripts and macros is given in details in *Axxon PSIM* software package. Guide for creating scripts (programming) and *Axxon PSIM* software package. Programming Guide (Jscript) documents.

4.2 Working with device channels on the map

Device channels connected via the SNMP protocol can be added to the map in three forms (possibly simultaneously):

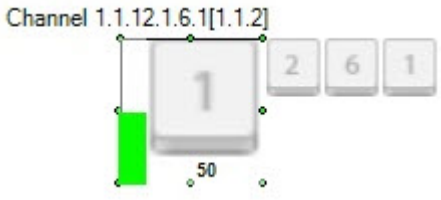
- as a state icon (**1**);
- as a state icon and indicator (**3**);
- in the text form (**2**).

> **Note**
>
> You can select the type of object display on the map when adding it (see *Axxon PSIM*. Administrator's Guide).



The indicator of a channel takes a value and color according to the rule (see Configuring rules). If a new value of a channel doesn't fall under any rule for the indicator, it disappears.

If a value of a channel falls under more than one of its states, its state icon changes, running all states, and when you click it, it displays smaller icons of all the element's states.



Note

The icon of channel state displays the corresponding number of a condition in the rule.
You can create and apply your own state icons. To get the instructions, contact the AxxonSoft support.

The following channel states of a device connected via the SNMP protocol are possible:

N	Normal
1	State 1
2	State 2
3	State 3
4	State 4
5	State 5
6	State 6
7	State 7
8	State 8
9	State 9
10	State 10

	Unused