



# Guide for configuring and working with the OPC Wrapper integration module

ACFA PSIM 1.1

Last update 07/26/2024

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

OPC server is a server of the OPC standard.

Data Access Server is a server (one of OPC server standards) for real-time data exchange with controllers, control systems, and other devices.

Alarms & Events Server is a server (one of OPC server standards) for notification about events: alarm situations, operator actions, informational messages and other.

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

### On the page:

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

### 2.1 Purpose of the document

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

The Guide has the following information:

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

### 2.2 General information about the OPC Wrapper integration module

The *OPC Wrapper* integration module is used for connection to any OPC server.

The *OPC Wrapper* integration module can exchange data and receive events according to the Data Access and Alarms & Events standards. It can also execute rules for the elements of the OPC server of the Data Access standard.

The following versions of the standards are supported:

1. DA 2.0
2. AE 1.0

### 3 Licensing of the OPC Wrapper integration module and list of supported systems

The *OPC Wrapper* integration module is licensed per one IP address. Any number of OPC servers can be on one IP address.

Systems which operation is guaranteed via the OPC Wrapper universal integration:

Name	Functionality of integration in Axxon PSIM
MOXA cards (list of all cards that can be connected via the Moxa MX-AOPC UA Server is presented <a href="#">here</a> )	<ul style="list-style-type: none"> <li>• manage relay depending on type of card;</li> <li>• receive the current state of connected sensors</li> </ul>
Bosch FPA 1200/5000 and MAP-5000, as well as UGM2020, UEZ2000, Allegiant, VCS. etc. panels as part of a BIS subsystem. The possibility of using the <i>OPC Wrapper</i> for other models must be checked with the manufacturer	<ul style="list-style-type: none"> <li>• monitoring, control</li> </ul>
FSA SIEMENS Cerberus-PRO	<ul style="list-style-type: none"> <li>• receive the current state of object;</li> <li>• reset the object to its default state;</li> <li>• arm/include the object in the controlled area;</li> <li>• disarm/exclude the object from the controlled area;</li> <li>• set the object in Test mode;</li> <li>• set the object in active state from quiet;</li> <li>• set the object in quiet state from active</li> </ul>
ACS Gallagher 6000	<ul style="list-style-type: none"> <li>• receive events about accesses;</li> <li>• door tampering;</li> <li>• exit by button</li> </ul>
Schrack Seconet (OPC server by TIGER-SOFT <a href="http://www.tiger-soft.com.pl">http://www.tiger-soft.com.pl</a> )	<ul style="list-style-type: none"> <li>• monitoring of the status of a zone and an element;</li> <li>• sending control commands to a group and an element;</li> <li>• internal acoustic off command;</li> <li>• external acoustic off command;</li> <li>• summary alarm reset command</li> </ul>

Name	Functionality of integration in Axxon PSIM
Honeywell Esser (OPC server by TIGER-SOFT <a href="http://www.tiger-soft.com.pl">http://www.tiger-soft.com.pl</a> )	<p>Monitoring:</p> <ul style="list-style-type: none"> <li>• status of a point and a zone;</li> <li>• status of an output;</li> <li>• status of a line;</li> <li>• status of a panel;</li> <li>• status of an acoustic signaling device;</li> <li>• status of an UE</li> </ul> <p>Control:</p> <ul style="list-style-type: none"> <li>• connect/disconnect a point and a zone;</li> <li>• connect/disconnect an output;</li> <li>• send a command to a panel</li> </ul>
SICK Laser Detectors (LMS1xx, LMS5xx, TiM3xx, JEF300, JEF500)	<ul style="list-style-type: none"> <li>• receiving events about alarms with positioning</li> </ul>
Bostex Door Access System (Bostex OPC server <a href="http://www.bostex.net/">http://www.bostex.net/</a> )	<ul style="list-style-type: none"> <li>• door status monitoring;</li> <li>• door control</li> </ul>

## 4 Configuration of the OPC Wrapper integration module

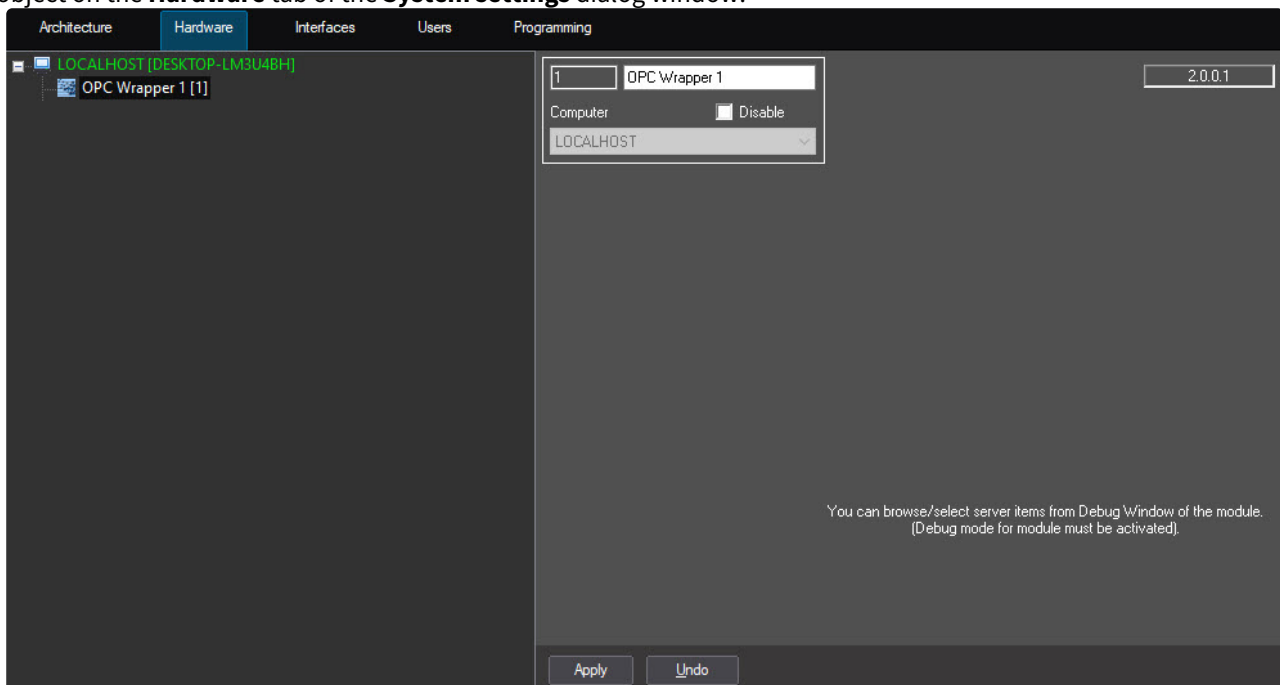
### 4.1 Configuration procedure for the OPC Wrapper integration module

The *OPC Wrapper* integration module is configured as follows:

1. [Activating the OPC Wrapper integration module.](#)
2. [Connecting to OPC servers and adding elements of the OPC server.](#)
3. [Configuring the monitoring of elements of the OPC server.](#)
4. [Configuring rules for elements of the OPC server of the Data Access standard.](#)
5. [Configuring the display of elements of the OPC server of the Data Access standard on the map.](#)

### 4.2 Activating the OPC Wrapper integration module

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



### 4.3 Adding the elements of the OPC server in Debug mode

The debug mode allows you to add the elements of the OPC server, to activate the monitoring of the selected elements and to assign the rules.

To enable the debug mode, do the following:

1. Enable the *Axxon PSIM* debug mode (see [Enabling and configuring the debug mode of Axxon PSIM](#)).
2. Set the **1** value for the **Debug** parameter (see [Registry keys reference guide](#), for more information about working with the registry, see [Working with Windows OS registry](#)).

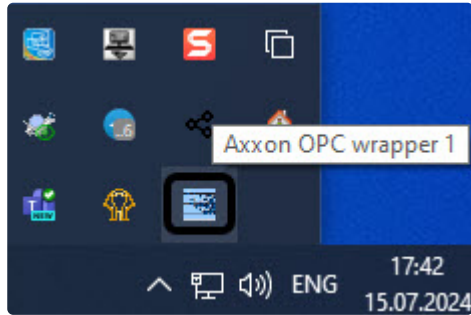
**Note**

If there is no **Debug** parameter, you must create it.

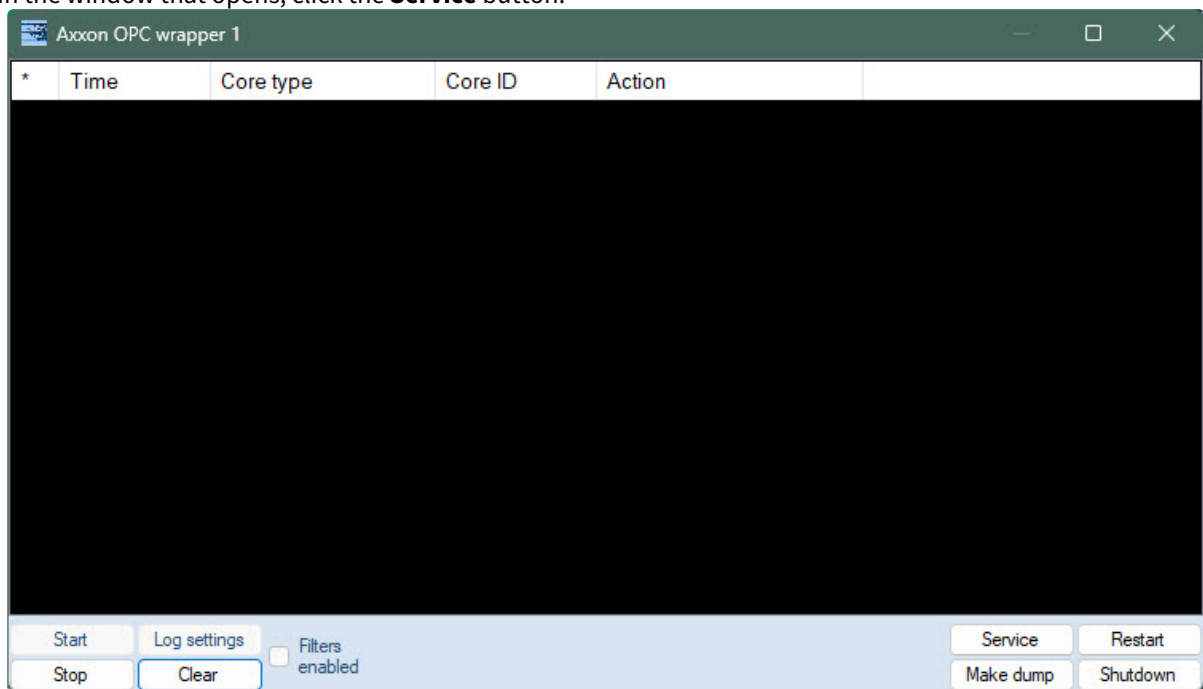
- Restart *Axxon PSIM* to apply the settings.

To add the elements of the OPC server in debug mode, do the following:

- Double left-click the icon of the *Axxon OPC wrapper* module in the Windows notification tray.



- In the window that opens, click the **Service** button.



A window for connecting to the OPC server opens.

3. In the window that opens, connect to the OPC server in one of two ways.
  - a. Manually: specify all field values to establish a connection to a locally installed OPC server.
    - i. In the **Domain** field, specify the name of the domain to which belongs the user who has a permission to search for OPC servers.

**Note**

If there is no domain in the system, or you need to select a user who doesn't belong to any domain, the **Domain** field must be left blank.

- ii. In the **Login** and **Password** fields, specify login and password of the user who has a permission to search for the Server.

**Attention!**

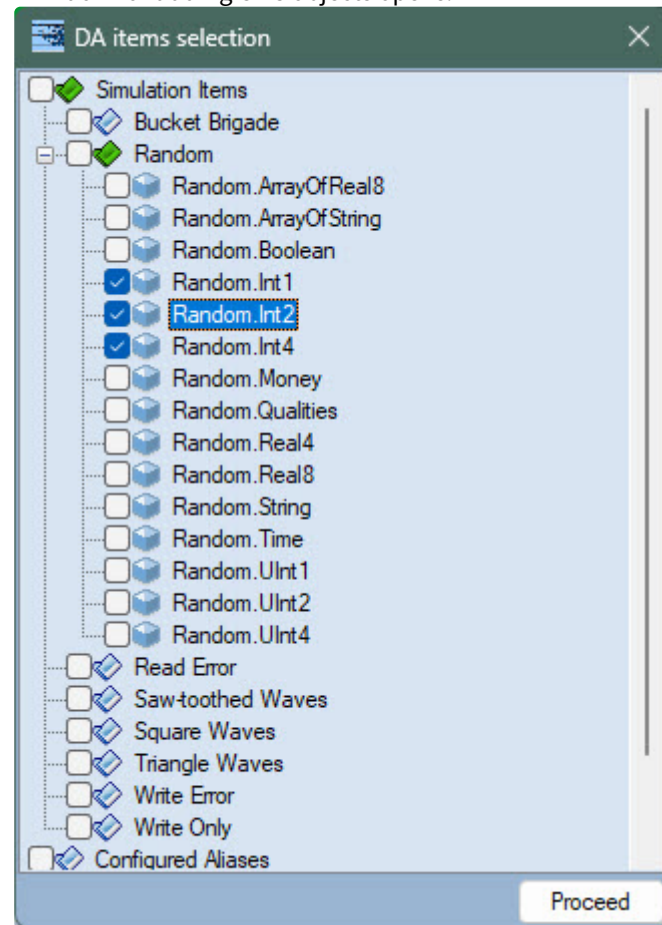
If you don't specify authentication parameters, the search for the Server will be performed by the current system user.

- iii. Select the OPC server standard by selecting the **Data Access** or **Access and Events** option.
- b. Automatically: search for a locally installed OPC server by clicking the **Search** button.

**Note**

Correct configuration of DCOM is required to search and connect to remote OPC servers.

- Click the **Browse** button.  
A window for adding OPC objects opens.

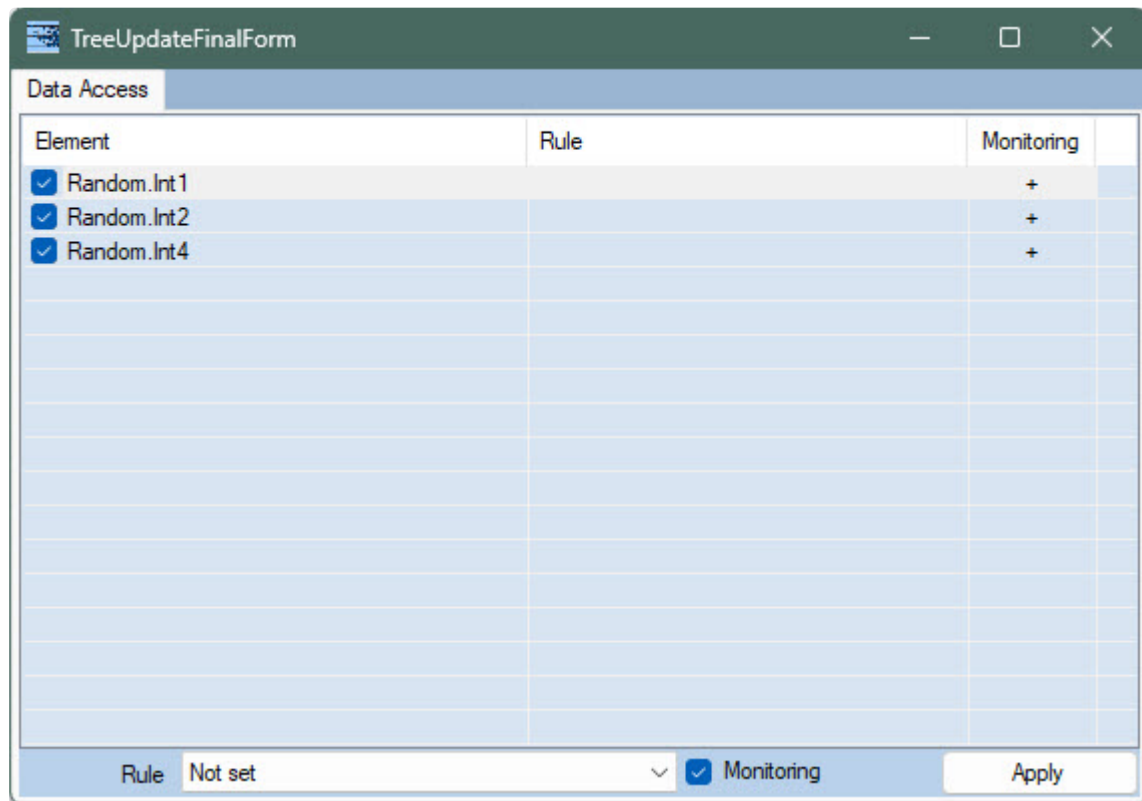


- Set the checkboxes next to the elements of the OPC server that you want to add to the hardware tree.

**Note**

You can set a checkbox next to the OPC server or a device. In the first case, all elements of all devices of the OPC server will be selected. In the second case, all elements of only selected devices will be selected.

- Click the **Proceed** button.
- In the window that opens, set the checkboxes next to the elements of the OPC server that you want to add to the hardware tree.



8. The following settings can be applied to the selected elements of the OPC server:
  - a. If it is necessary to monitor the status of the elements of the OPC server, set the **Monitoring** checkbox.

**Note**

You can enable the monitoring of the status of the elements of the OPC server later (see [Configuring the monitoring of the elements of the OPC server](#)).

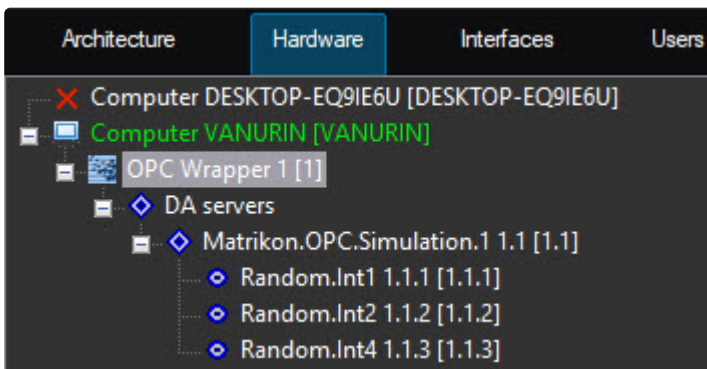
- b. If it is necessary to assign the Data Access rules for the elements of the OPC-server, select the corresponding rule in the **Rule** drop-down list (see [Configuring rules for the elements of the OPC server of the Data Access standard](#)).

**Note**

You can select several elements of the OPC server at once using the hotkeys, for example:  
 "Ctrl" + "a"—select all elements.  
 "Shift" + left-click on the specified element—select all elements starting from the currently selected one to the one specified with the mouse click.  
 "Shift" + keyboard arrows "down" or "up"—select the elements one by one going up or down from the currently selected one.

9. Click the **Apply** button to add the elements of the OPC server to the hardware tree.

As a result, the objects that correspond to the elements of the OPC server will be created: a group of the **AE servers** objects—OPC servers of the Alarms & Events standard, **DA servers**—OPC servers of the Data Access standard.

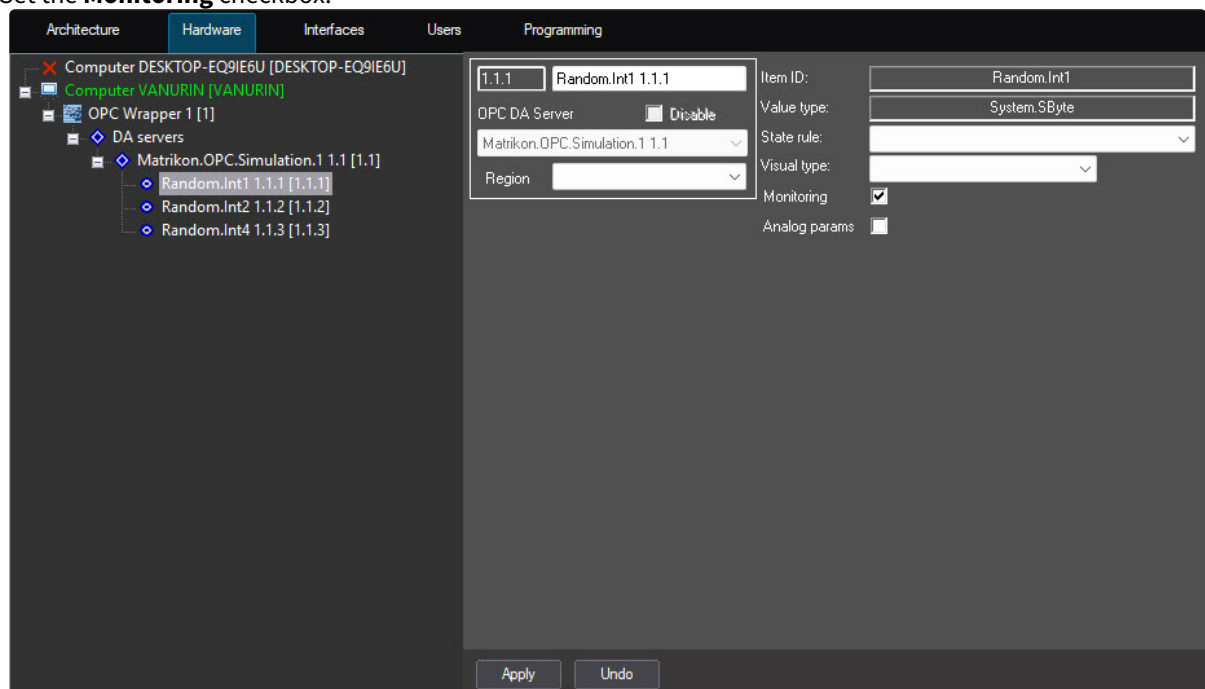


Adding the elements of the OPC server in Debug mode is complete.

## 4.4 Configuring the monitoring of the elements of the OPC server

By default, the state of the elements of the OPC server isn't monitored. To monitor events of the elements in the *Event Viewer*, do the following:

1. Go to the settings panel of the corresponding object.
2. Set the **Monitoring** checkbox.



3. Click the **Apply** button.
4. Restart *ACFA PSIM*.

Monitoring of the element will be activated after the *ACFA PSIM* restart.

## 4.5 Configuring rules for the elements of the OPC server of the Data Access standard

There are three types of rules for the elements of the OPC server of the Data Access standard:

1. Change the state of an element when an element accepts a value from a certain range.
2. Set the specified value to an element from the map (see [Working with OPC-server elements of Data Access standard on the map](#)).
3. Change of indicator state when an element accepts a value from a certain range (see [Working with OPC-server elements of Data Access standard on the map](#)).

You can configure rules on the basis of the **OPC DA State rule** object that is created on the basis of the **OPC Wrapper** object. This object is a group of rules that can include rules of all types. Only one group of rules can be assigned to each element of the OPC server of the Data Access standard.

#### 4.5.1 Configuring the rule of changing the element state

To configure this rule, on the **States** tab of the settings panel of the **OPC DA State rule** object, specify the following parameters: in the **Min** column, specify the start of an interval, in the **Max** column, specify the end of an interval, set the **Use** checkbox to activate the interval, in the **Event text** column, enter the message that will be displayed when an element accepts the value from the specified range. You can specify up to 10 intervals.

Rule #	Min	Max	Use	Event text
01	0	50	<input checked="" type="checkbox"/>	Event 1
02	51	100	<input checked="" type="checkbox"/>	Event 2
03	75	100	<input checked="" type="checkbox"/>	Event Cross

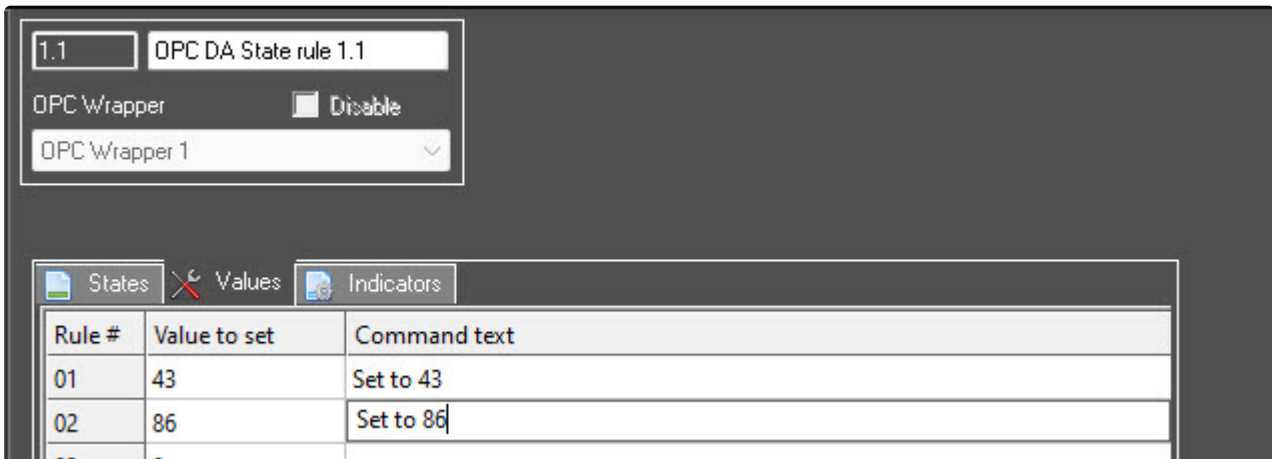
#### **Attention!**

If the value of an element falls into several intervals, the element will have multiple states (multistate).

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

#### 4.5.2 Configuring the command to set value to an element

To configure this rule, on the **Values** tab of the settings panel of the **OPC DA State rule** object, specify the following parameters: in the **Value to set** column, enter the value that is set by the command, in the **Command text** column, enter the name of the command. You can specify up to 10 commands.



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

You can apply the commands from the map (see [Working with the OPC server elements of the Data Access standard on the map](#)).

### 4.5.3 Configuring the rule of changing the indicator state

To configure this rule, go to the **Indicators** tab of the settings panel of the **OPC DA State rule** object. Description of parameters is given in the table. You can specify up to 10 indicator states.

Parameter	Description
Rule #	Rule number
V. min, V. max	Range of element values for the rule
S. min, S. max	Range of values that the indicator will accept according to the rule
Usage	Activate the interval
Red, Green, Blue	Specify the color of the indicator according to the RGB model

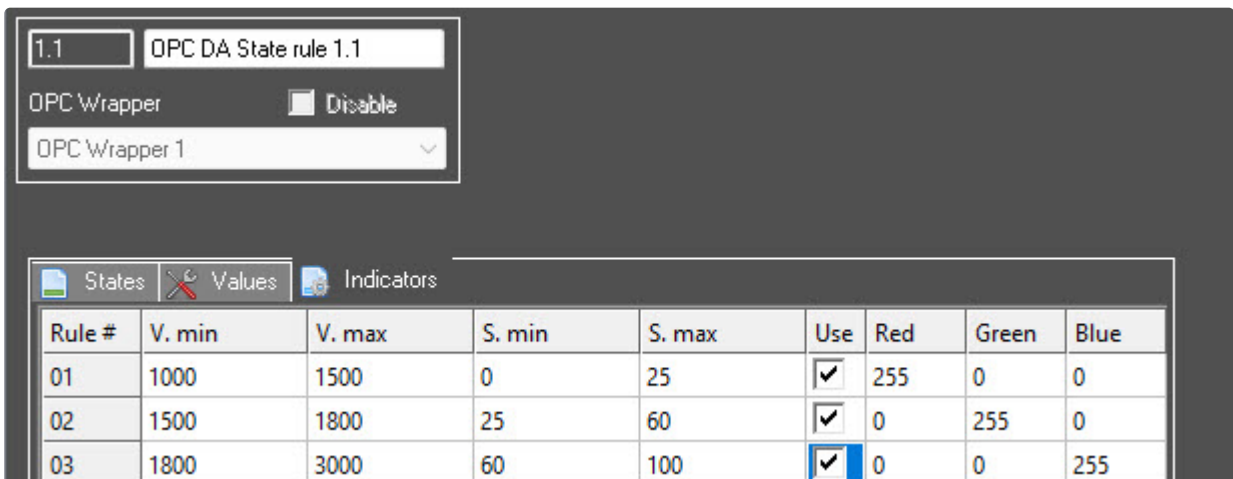
#### **⚠ Attention!**

If the value of an element falls into several intervals at once, the indicator accepts a value according to the rule with the smallest number among the suitable ones.

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

Indicator and its value are displayed on the map (see [Working with OPC-server elements of Data Access standard on the map](#)).

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



There are three intervals of element values depending on which the indicator takes a certain proportional value and color. To calculate the exact value of the indicator, use the following formula:

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

where V is the exact value of the element.

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

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

the indicator color is red.

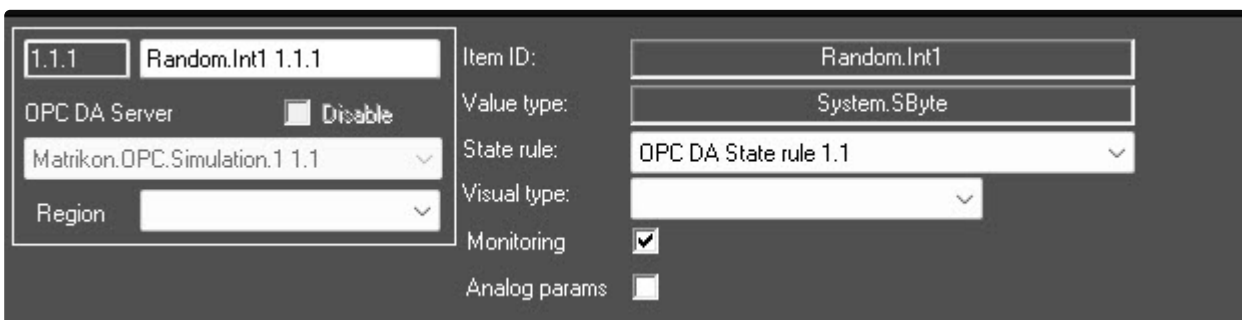
If V=2200, then the indicator value

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

the indicator color is blue.

#### 4.5.4 Setting the rule to an element

To set the rule to an element, on the settings panel of the corresponding object, from the **State rule** drop-down list, select a specific group of rules (the **OPC DA state rule** object).



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

## 4.6 Configuring the display of the OPC server elements of the Data Access standard on the map

### On the page:

- [Configuring the display of elements on the map](#)
- [Creating custom icons](#)

### 4.6.1 Configuring the display of elements on the map

To configure the display of elements on the map, do the following:

1. Go to the settings panel of the object corresponding to the required element.

The screenshot shows a configuration window for an OPC server element. The left pane contains the following fields:

- Item ID: 1.1.1
- Random.Int1 1.1.1
- OPC DA Server: Matrikon.OPC.Simulation.1 1.1 (with a 'Disable' checkbox)
- Region: (empty dropdown)

The right pane contains the following fields:

- Item ID: Random.Int1
- Value type: System.SByte
- State rule: OPC DA State rule 1.1
- Visual type: (dropdown menu with 'Common icons' selected)
- Monitoring: (empty dropdown)
- Analog params: Custom set

At the bottom of the window are 'Apply' and 'Undo' buttons.

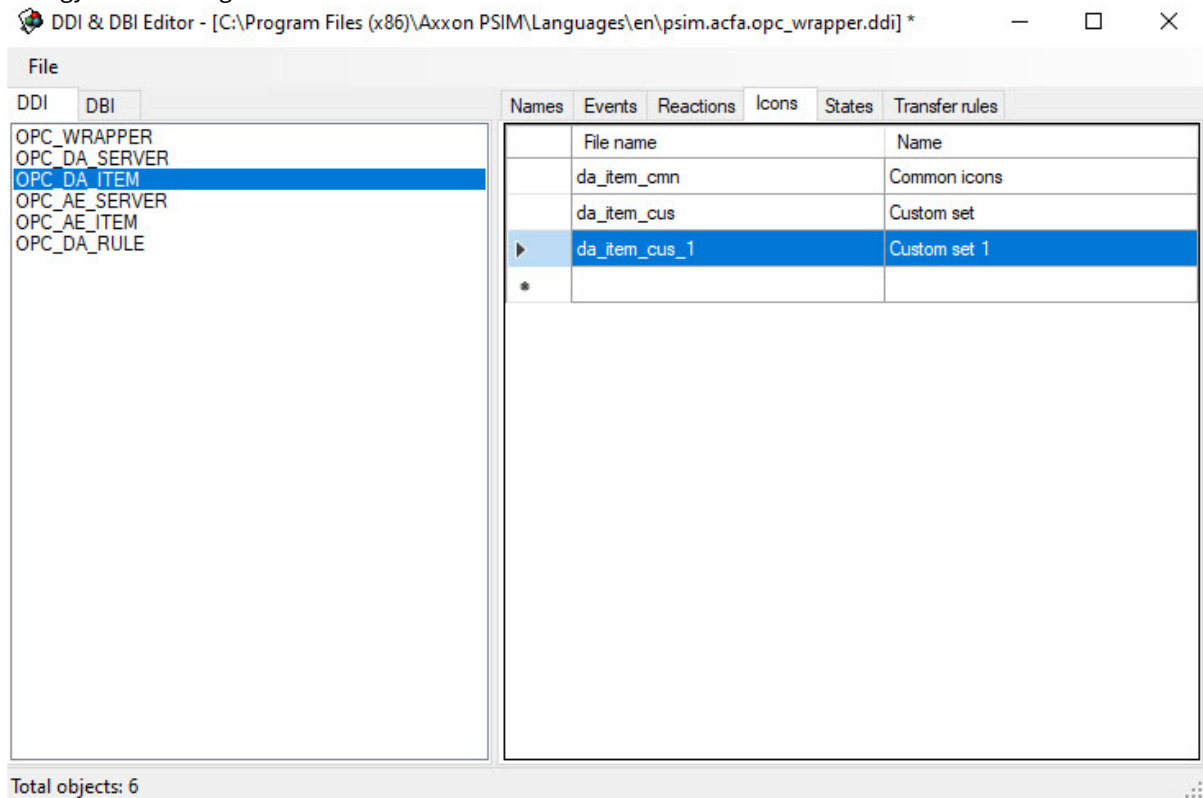
2. From the **Visual type** drop-down list, select the set of element state icons: **Common icons** are icons of *ACFA PSIM*, **Custom set** is custom set of icons. You can create your own set of icons (see below).

3. Set the **Analog params** checkbox if you want to display the value of an element in text form on the map.
4. Click the **Apply** button.

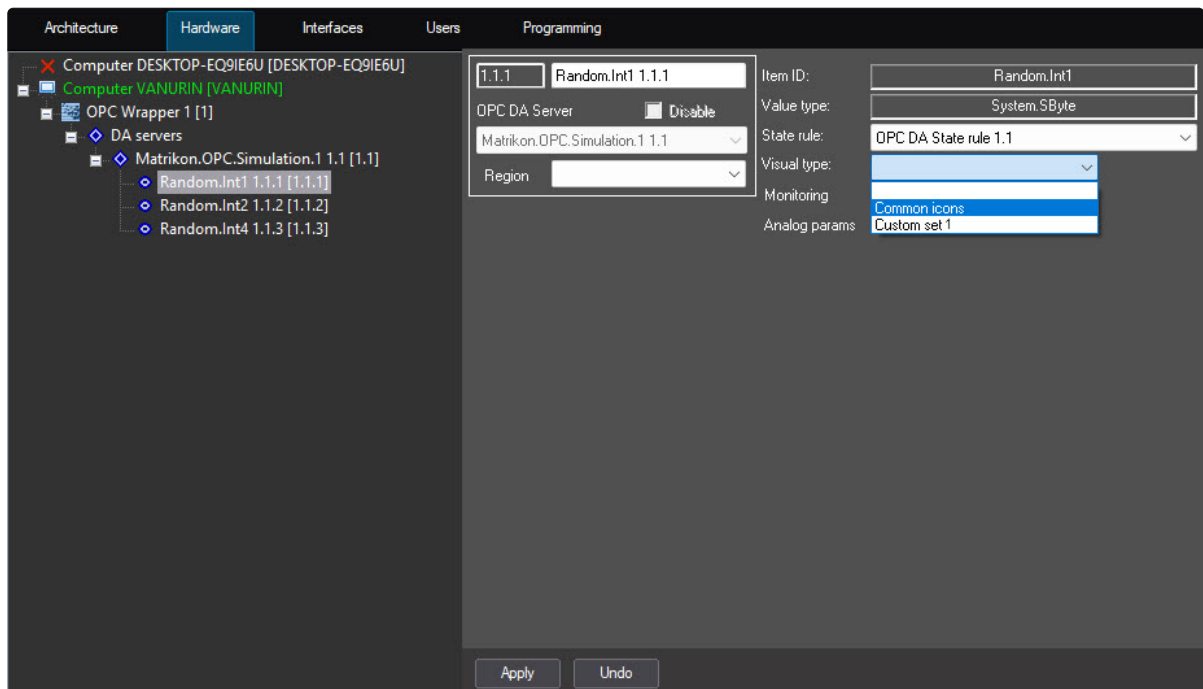
## 4.6.2 Creating custom icons

In *ACFA PSIM*, you can create your own icon sets. For this, do the following:

1. Run the `ddi.exe` utility (see [Using the ddi.exe Tool to Work with DBI files](#)).
2. Open the `psim.acfa.opc_wrapper.ddi` file located at `C:\Program Files (x86)\Axxon PSIM\Languages\ru\`.
3. Manually add a custom set of icons to the **Icons** tab of the **OPC DA ITEM** object in the utility, naming it by analogy with existing sets:



4. Update the database structure using the `idb.exe` utility (see [The idb.exe utility for converting databases, selecting database templates and making backup copies of databases](#)).
5. The created set of icons will appear in the **Visual type** drop-down list on the settings panel of the **OPC DA Item** object.



6. Create icons for the custom set. Icons must be in PNG format with a size of 32x32 pixels. The name of the icon file includes: set name\_state name, for example: da\_item\_cus\_1\_state1.png.
7. Add these icons to the folder located at C:\Program Files (x86)\Axxon PSIM\Bmp.

As a result, a custom set of icons is created that you can use when working with the Map.

## 5 Working with OPC Wrapper integration module

### 5.1 General information about working with the OPC Wrapper integration module

Events of the elements of OPC servers are sent to the *Event Viewer*.

Icon, state indicator, and the element value of the OPC server of the Data Access standard can be displayed on the map.

For the information on configuring the **Event Viewer** and **Map** interface objects, see *Axxon PSIM Administrator's Guide*.

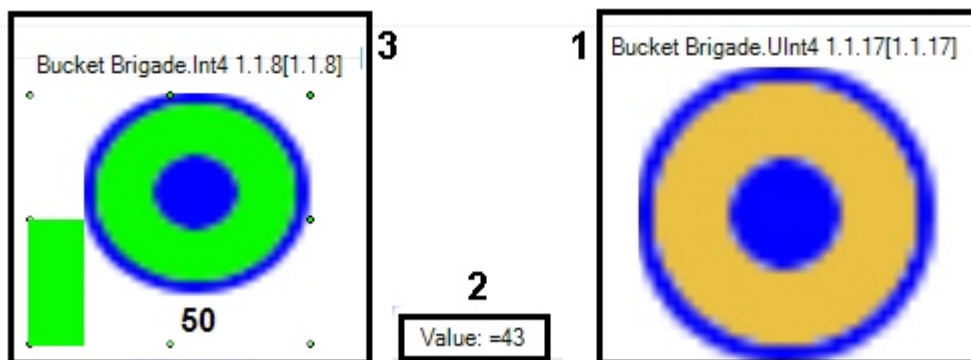
For the information on working with the **Event Viewer** and **Map** interface objects, see *Axxon PSIM Operator's Guide*.

You can configure reactions to any element values using scripts and macros. For the information on working with scripts and macros, see *Guide for creating scripts (programming)* and *The Script object. Programming using the JScript language*.

### 5.2 Working with the OPC server elements of the Data Access standard on the map

You can add the OPC server elements of the Data Access standard to the map in three ways (can be done at the same time):

- as an icon of state (**1**),
- as an icon of state and indicator (**3**),
- in the text form (value of an element, **2**).



#### **Note**

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

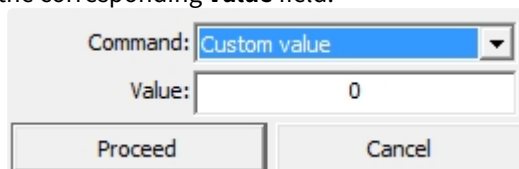
Using any object on the map, you can change the value of the corresponding element in one of the following methods:

Method 1

1. Right-click to open the menu and select the **Change value** item.



2. From the **Command** drop-down list, select one of the previously created commands (see [Configuring the command to set value to an element](#)) or the **Custom value** item that allows specifying any element value in the corresponding **Value** field.



3. To accept command of changing the element value, click the **Proceed** button.

#### Method 2

1. Right-click to open the menu and select the **Execute** item.  
A window for selecting from the list of the previously created commands will open (see [Configuring the command to set value to an element](#)).
2. Select the required command to execute.

The element indicator takes a value and a color according to the rule (see [Configuring the rule of changing the element state](#)). If a new value of an element doesn't fall under any rule for the indicator, it will disappear.

If the element value falls under more than one of its states (see [Configuring the rule of changing the element state](#)), then its state icon will change running through all states, and when you click it, smaller icons of all element states are displayed.

