EN CE UK CA

akytec



akYec Cloud

Cloud Service

User guide

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Contents

1. Concepts 3
1.1. General information 3
1.2. Terms and abbreviations 4
2. Quick start 5
3. Sign up 6
4. Legal entities 7
4.1. General information 7
4.2. Legal entity sign up 7
4.3. Offer agreement 8
5. Individuals 9
5.1. Individual sign up 9
5.2. Offer agreement 9
6. Rights and roles 10
7. Navigating the interface 12
8. Add and set up devices 13
8.1. Adding a device 13
8.2. Device replacement 14
8.3. Device setup 14
8.3.1. General device settings (basic settings) 15
8.3.2. Setting the device parameter types 17
8.3.3. Customizing the display of parameters in reports 18
8.3.4. Device parameter settings when operating via Modbus protocol 19
8.3.5. Setting the device map location 21
8.4. Device copy 22
9. Monitoring and analysis 24
9.1. Viewing the current device data (Parameters) 24
9.2. Viewing the device data in table form 26
9.3. Viewing the device data in graph form 27
9.4. Viewing the device map location 28
9.5. Facility visualization (mnemonic diagrams) 28
9.5.1. Creating a mnemonic diagram 29
9.5.2. Viewing the mnemonic diagram 34
9.6. Custom graphs 35
9.6.1. Adding a custom graph, trend or event diagram 35
9.6.2. Viewing a custom graph, trend, or event diagram 38
9.7. Desktop 40
9.7.1. Adding a desktop 40
9.7.2. Viewing desktops 43
9.8. Consolidated report 44
9.8.1. Adding a consolidated report 44
9.8.2. Viewing the consolidated report 48
10. Events and notifications 49
10.1. Device events 49
10.1.1. Setting the device events 49
10.1.2. Viewing the device event list 52

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10.2. Facility events 53
10.2.1. Setting the facility events (in device group) 53
10.2.2. Viewing custom facility events 54
10.3. Viewing the current alarms in devices and facilities of the account 54
10.4. Notifications 55
10.4.1. General information 55
10.4.2. Notification setup 55
10.4.3. Device notification setup 57
10.4.4. Telegram bot setup 57
11. Remote control 60
11.1. Recording the values of the controlled parameters into the device 60
11.2. Creating and recording parameters from a template into the devices 61
12. Adding and configuring user rights 63
13. User profile 65
13.1. Editing the user data 65
13.2. Enabling / disabling two-factor authentication 65
13.3. Viewing and terminating active sessions 67
14. Company profile and account owner 68
14.1. Viewing and editing the company information 68
14.2. Viewing information and transferring account owner rights 68
15. Company administration (system integrator status) 70
15.1. Adding a customer company 70
15.2. Configuring user access rights to customer companies 71
16. Integration 72
16.1. API 72
17. Connection of akYtec devices 73
17.1. Connection over RS485 (via gateway) 73
17.2. Connection over Ethernet 75
18. Connection of PLC210 and SPC210 with Codesys 3.5 78
18.1. Connection over RS485 (via gateway) 78
18.2. Connection over Ethernet 84
19. Programmable relay connection 90

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1 Concepts

1.1 General information

The akYtec Cloud service is designed for remote device monitoring, control and prompt notification of emergency situations at facilities.
To access akYtec Cloud, you need a web browser and an internet connection.
Features of akYtec Cloud:

– Graph and table updates (device polling period): at least every 60 seconds
– Instant control: command execution with no lag*
– Data storage: up to 90 days from the current date
– Mnemonic diagrams: up to 3
– Charts: up to 7
– Summary reports: up to 7
– Custom programs for the virtual PLC (up to 50)
– Unlimited objects on the map;
– Unlimited e-mail and Telegram bot alerts;
– Plug and play for akYtec devices with pre-made connection templates
– GDPR compliant (Tier III EU servers)
– Secure data transmission from the device to the cloud
– 99.6% server uptime.

NOTE
* The speed of real-world execution depends on the stability of your internet connection and hardware performance.

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1.2 Terms and abbreviations

API— a software interface that allows akYtec Cloud to be integrated with other information systems
Acceptance of the offer — agreeing to the terms and conditions of the offer by registering for the service
Categories — groups of devices
Mnemonic diagram — a visualization screen used to display parameter values and events
Facility — one or more devices
OS — operating system
Privileges — user access rights that determine their experience with akYtec Cloud
Gx24 – network gateways GG-24–, GE-24–, GW-24–Cloud

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2 Quick start

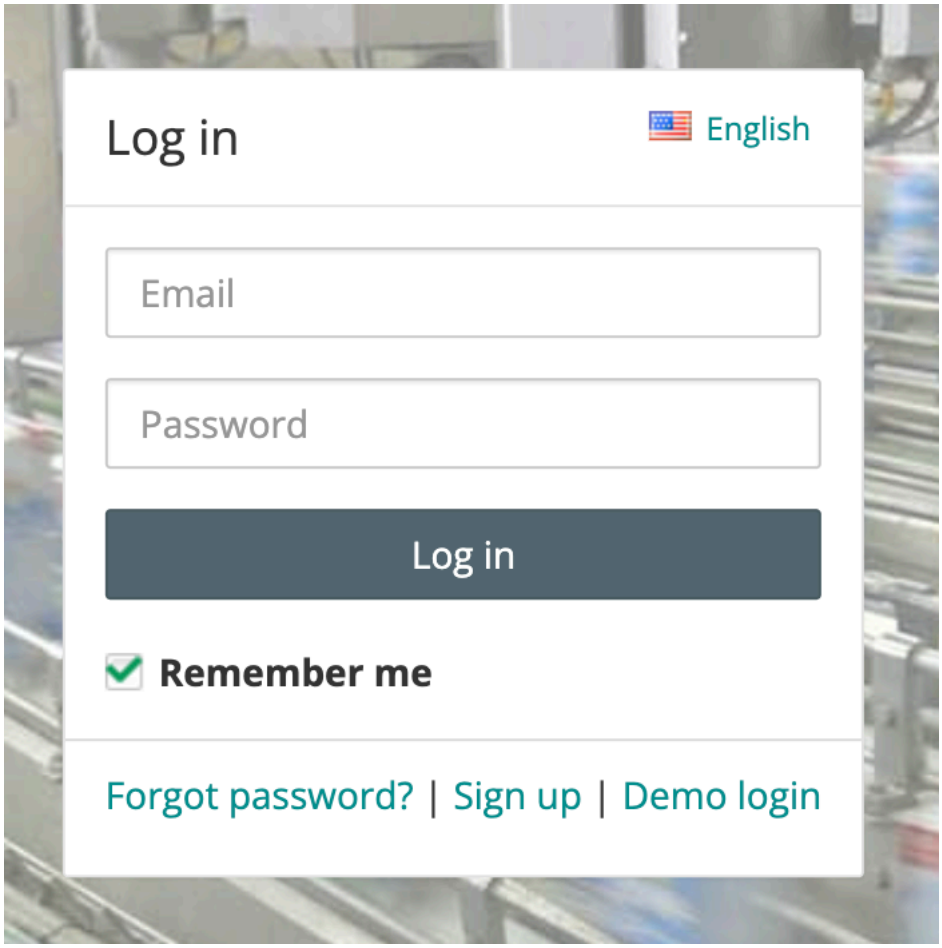
1. Sign up for the akYtec Cloud service as an *individual* or *legal entity*.
2. *Add a device*.
3. *Configure the device*.
4. *Customize the display of device parameters* (accuracy, dimension, multiplier, text description).
5. *Customize the display of device parameters in reports* (parameters, graphs, tables).
6. *Configure the device events and notification settings.*
7. If necessary, *customize the facility events*.
8. Add advanced features:
   - Visualization of facility operations using simple *mnemonic diagrams*
   - User-defined *custom graphs* for comparing data from different devices or similar parameters
   - *Consolidated report* for analyzing the operation of the facility over a period
   - *Programming automation logic in Pascal for controlling the facility.*
9. *Add new users and assign roles and access rights to facilities*.

akYtec Cloud team thanks you for choosing our service and hopes your experience will be easy and seamless.

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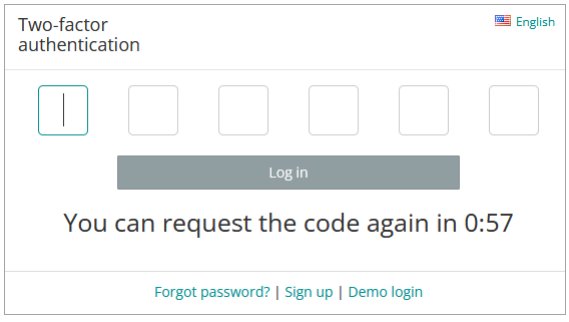
3 Sign up

Open your browser and type in https://cloud.akytec.de/. A window will appear:



Sign up in the service as a *legal entity* or as an *individual*.
Enter the **Email** and **Password** you used during sign-up. Click the **Log in** button. With two-factor authentication disabled, the main akYtec Cloud window will appear.
With two-factor authentication enabled:

– Check the email used when adding a user.
– In the window that appears, enter the one-time code from the email and click the **Log in** button.



– The main akYtec Cloud window will appear.

NOTICE
If you entered an incorrect code 3 times, you can re-entry after 1 hour. If you enter the code incorrectly one more time, your login/password will be temporarily frozen. In this case, please contact technical support at *info@akytec.de*.

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4 Legal entities

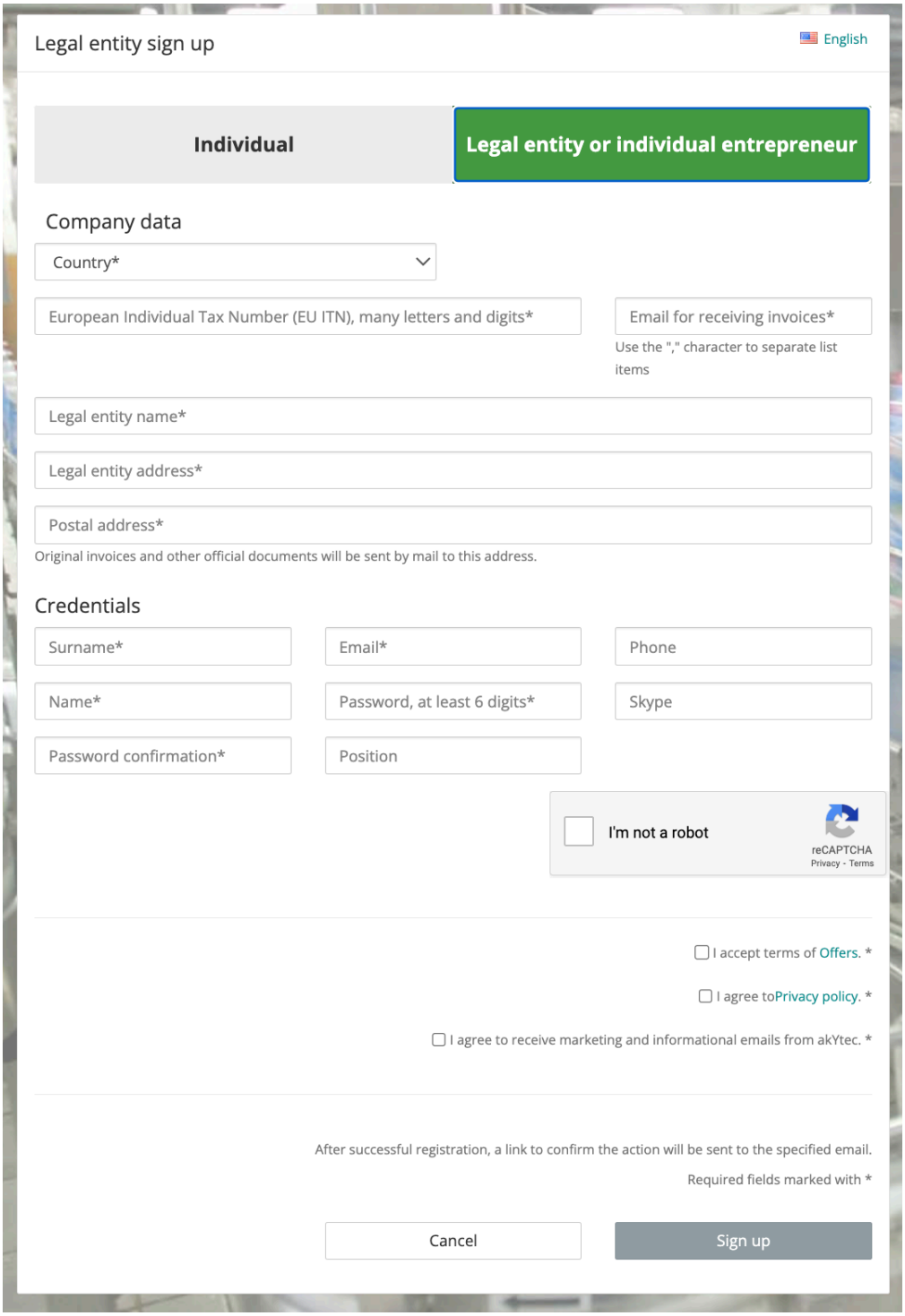
4.1 General information

You can obtain the legal entity status:

– *By signing up for the akYtec Cloud service*
– By converting an individual account to a legal entity account. To change your account type (Individual -> Legal entity), please contact our support team at *info@akytec.de*.

Services for legal entities are provided based on a unilateral *offer*.

4.2 Legal entity sign up



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1. Fill out the credentials.

   CAUTION
   Company credentials can only be changed by contacting technical support at ***info@akytec.de***.

2. Read the offer and privacy policy, and check the box to indicate your agreement.
3. Click the **Sign up** button. An email will be sent to the specified address to confirm your sign-up.
4. Open the email you received and click the confirmation link. The akYtec Cloud window will open, and you will see a message: **“Your sign-up has been confirmed.”**

   CAUTION
   If you have not received the confirmation email, please contact Technical Support at ***info@akytec.de.***

5. Log in to akYtec Cloud.

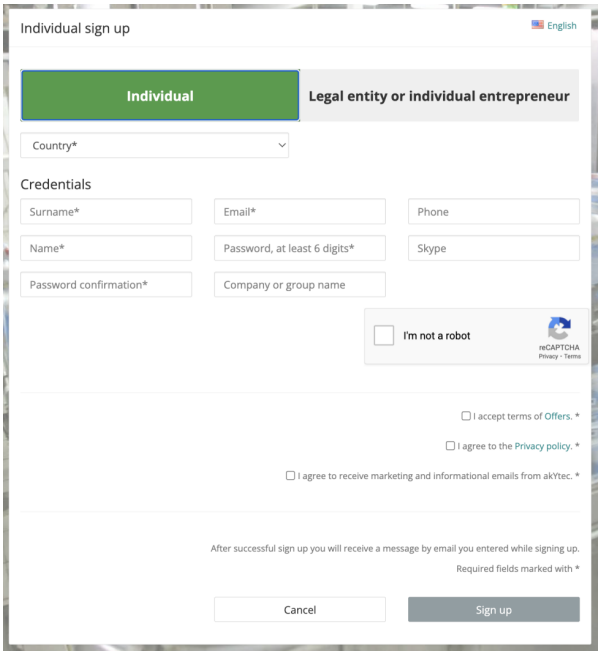
4.3 Offer agreement

The akYtec Cloud service is provided based on a unilateral *offer*.

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5 Individuals

5.1 Individual sign up



1. Fill out the credentials.
2. Read the offer and privacy policy and check the box to indicate your agreement.
3. Click the **Sign up** button. An email will be sent to the specified address to confirm your sign-up.
4. Open the email you received and click the confirmation link. The akYtec Cloud window will open, and you will see a message: **“Your sign-up has been confirmed.”**.
5. Log in to akYtec Cloud.

5.2 Offer agreement

The akYtec Cloud service is provided based on a unilateral *offer*.

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6 Rights and roles

There are two types of users in the akYtec Cloud service:
– Administrator: Can add users and has access to all the capabilities of other roles.
– User: Has restricted rights, including:
  – Access to a specific device group
  – Access to certain actions (roles)

Rights and roles are assigned when *adding or modifying a user account*.

Role	Role enabled (available options)	Role disabled (available options)
Administrator	– **Add users** – All the capabilities available to the other roles	Options according to the chosen roles
Profile Manager	Full access to your company profile: – View – Edit the company profile	Restricted access to company profile: – View the company profile
Category Manager	Full access to groups: – Create – Rename – Move groups and subgroups – Organize devices, mnemonic diagrams, templates, graphs, reports, programs, desktops into groups (if there is access to devices) – Delete	Restricted access to groups: – View groups – Distribute devices, mnemonic diagrams, templates, graphs, reports, programs, desktops to groups (if there is access to devices)
Device Manager	Full access to the company's devices: – *Add* – *Set up devices*	Restricted access to the company's devices: – View data and events in a device – Organize devices into groups
Mnemonic Diagram Manager	Full access to *mnemonic diagrams*: – *View* – *Add* – Edit – Delete mnemonic diagrams	Restricted access to mnemonic diagrams: – *View* – Start templates on mnemonic diagrams if the **Command Manager** role is enabled
Graph Manager	Full access to *custom graphs*: – View custom *graphs and trends* – *Add*, edit, delete custom graphs of the company	Restricted access to *custom graphs*: – View custom *graphs and trends*
Report Manager	Access to the *consolidated report*: – *View* – *Add* – Delete the consolidated report	Restricted access to the *consolidated report*: – *View*
Program Manager	Full access to *custom programs* : – *View* – *Create and compile* – *Start and stop* – Delete custom programs	No access

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Desktop Manager	Full access to *desktops*: – *View* – *Add* – Edit – Delete	Restricted access to *desktops*: – *View* – Start templates if the **Command Manager** role is enabled – View trends
Event Manager	Full access to *events*: – View the *device events* and *facility events* list – Set up *device events* or *facility events* – Edit – Delete	Restricted access to events: – View the *device events* and *facility events* list
Command Manager	Full access to templates: – *Create* – *Start templates* and start templates on mnemonic diagrams, run templates on desktops – Delete	No access
Configuration Manager	Access to device configurations: – Record a set of controlled parameters *(configurations)* to the device	No access
Own Settings Manager	Full access to your profile: – Change account data	Restricted access to your profile: – View account data

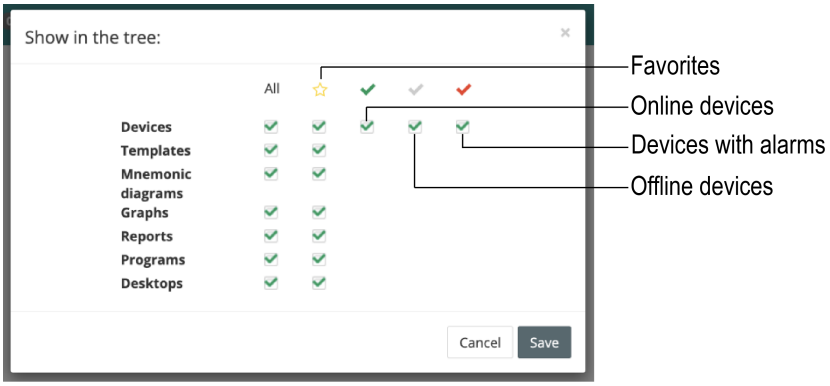
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7 Navigating the interface

The akYtec Cloud main window:



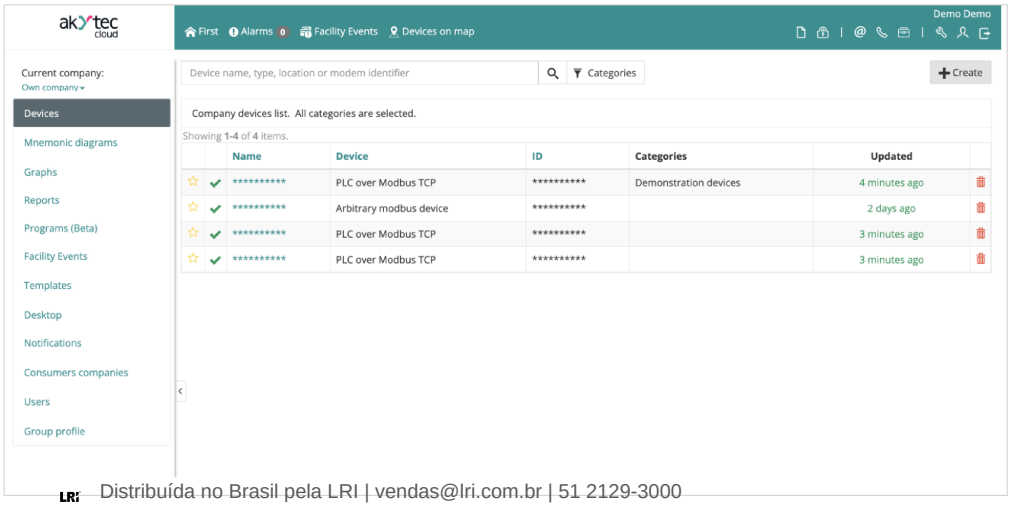
Setting up the tree display:



Navigating the **Administration** section:

Tabs with settings of:

- devices
- mnemonic diagrams
- custom graphs
- reports
- custom programs
- facility events
- templates
- desktops
- notifications
- user control
- change of group profile



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8 Add and set up devices

8.1 Adding a device

Devices are added to akYtec Cloud and set up based on:
– Device type
– Connection interface (RS485 or Ethernet).

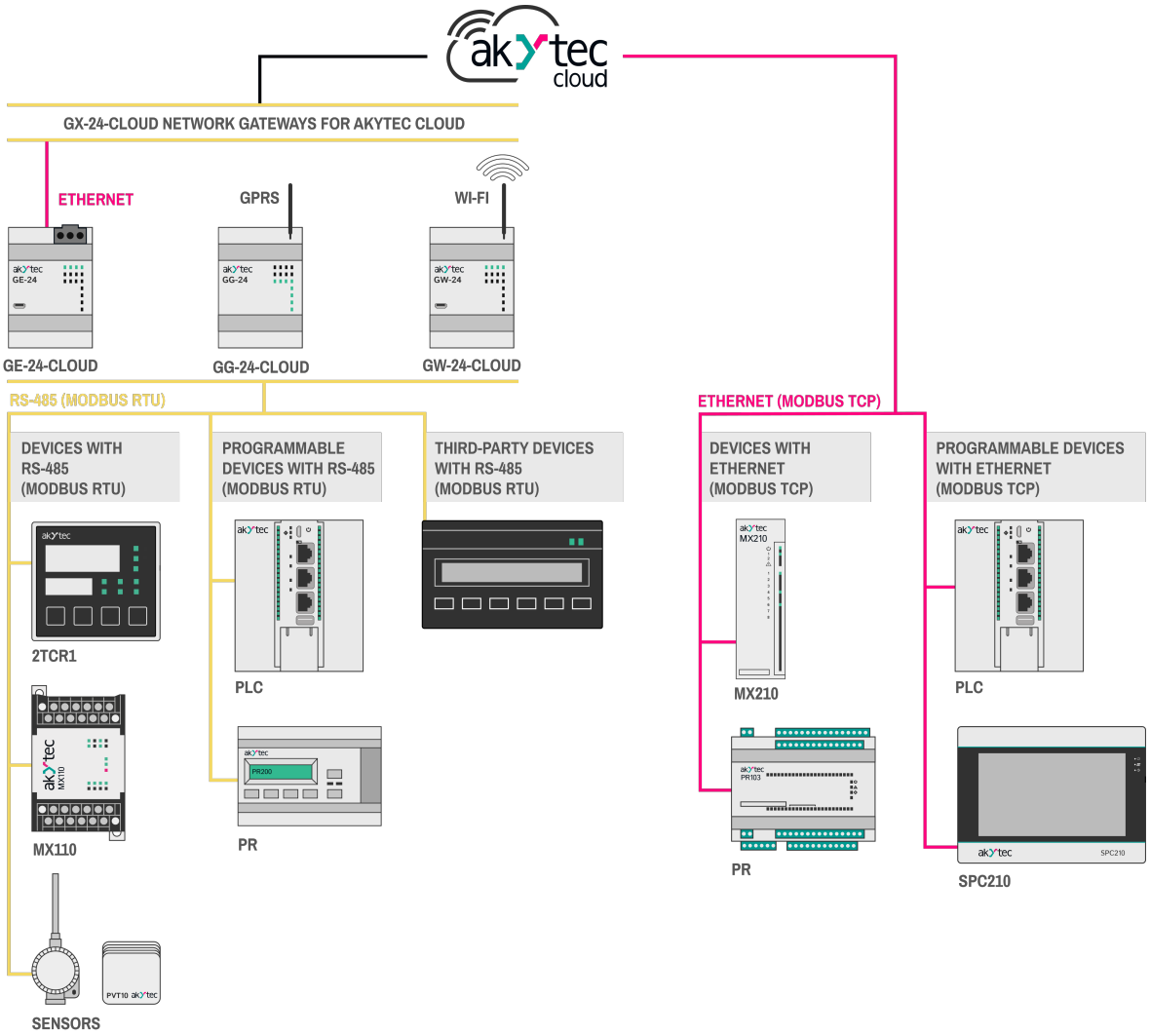


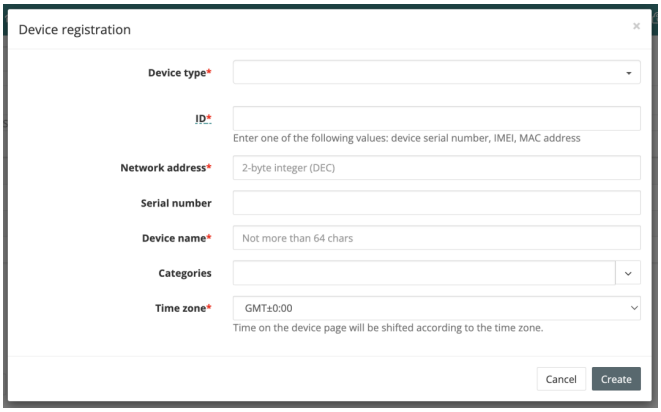
Table 8.1 Devices

Device	Connection and configuration
Programmable logic controllers (PLC, SPC)	
PLC210, SPC210	*Connection via Ethernet*
Programmable compact controller	
SMI200	*Connection via RS485 (via gateway)*
Programmable relays	
PR103, PR200, PR102, PR100	*Connection via RS485 (via gateway)*

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	Connection via Ethernet
	Programmable relay connection
Input and output modules (Mx)	
MV210, MU210, MK210, ME210	*Connection via Ethernet*
MV110, MU110, MK110, ME110	*Connection via RS485 (via gateway)*

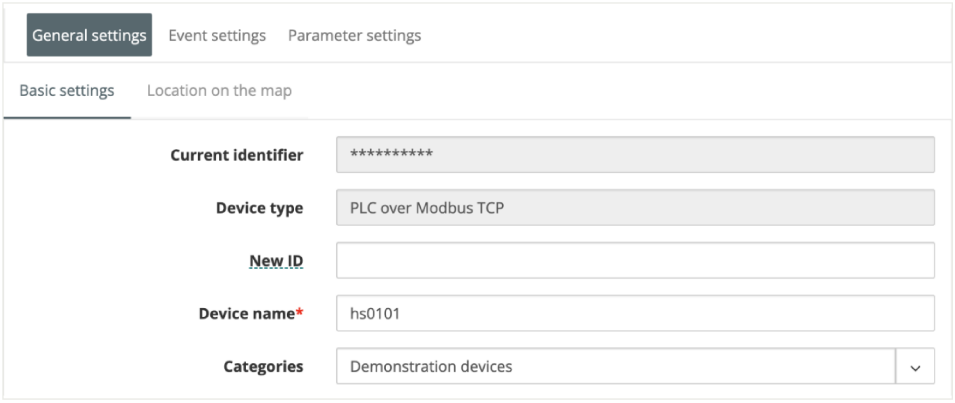
Open the **Devices** tab in the **Administration** section. Click the **Add device** button. A window will appear:



Device type – select the model of the akYtec device or a Modbus device.

8.2 Device replacement

Open the **Devices** tab in the **Administration** section. Select a device from the list and click on its name. A window with the device settings will appear:

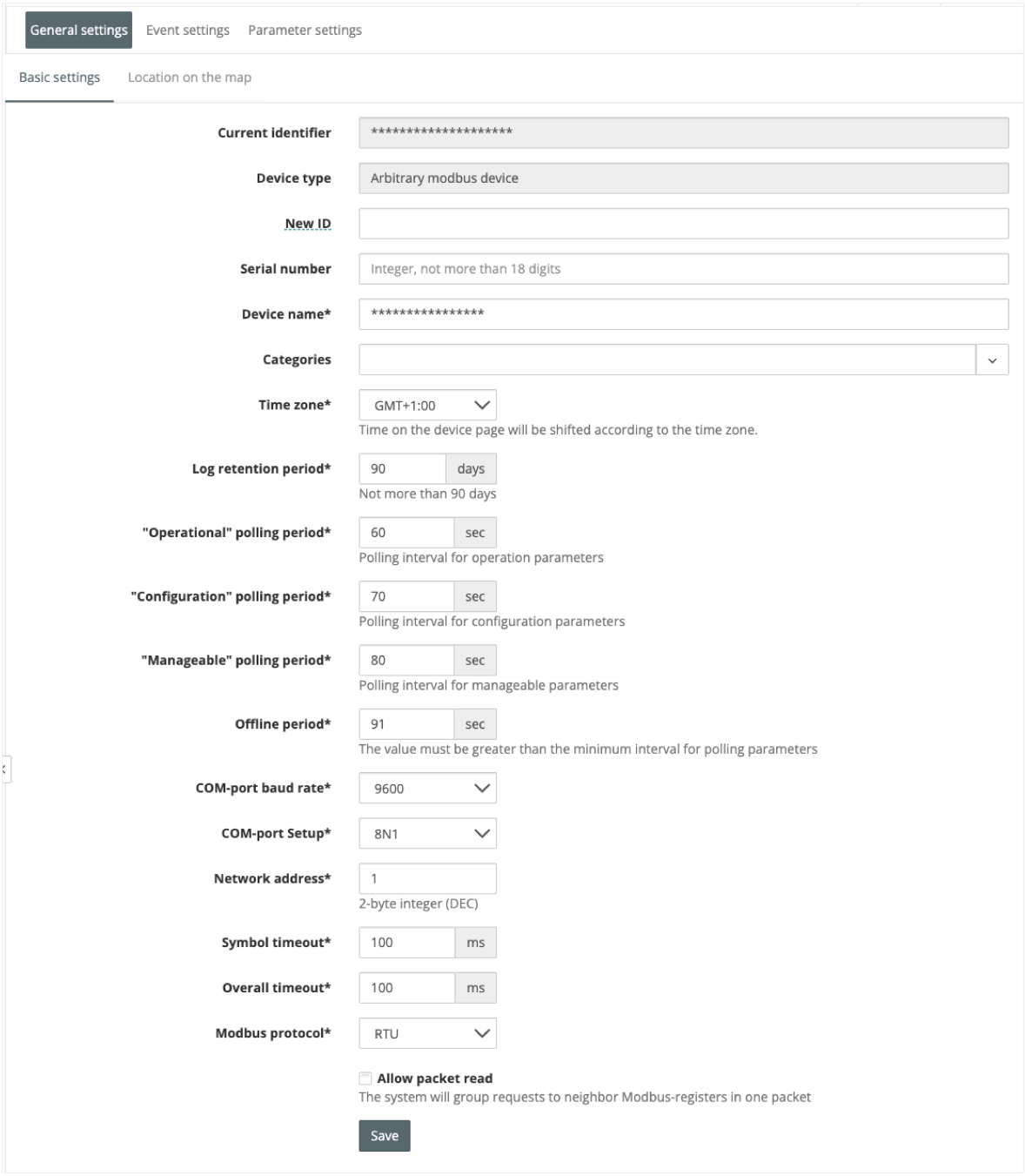


New ID – enter the ID of the new device.
Click the **Save** button. akYtec Cloud will replace the device.

8.3 Device setup

Open the **Devices** tab in the **Administration** section. Select a device from the list and click on its name. A window with the device settings will appear:

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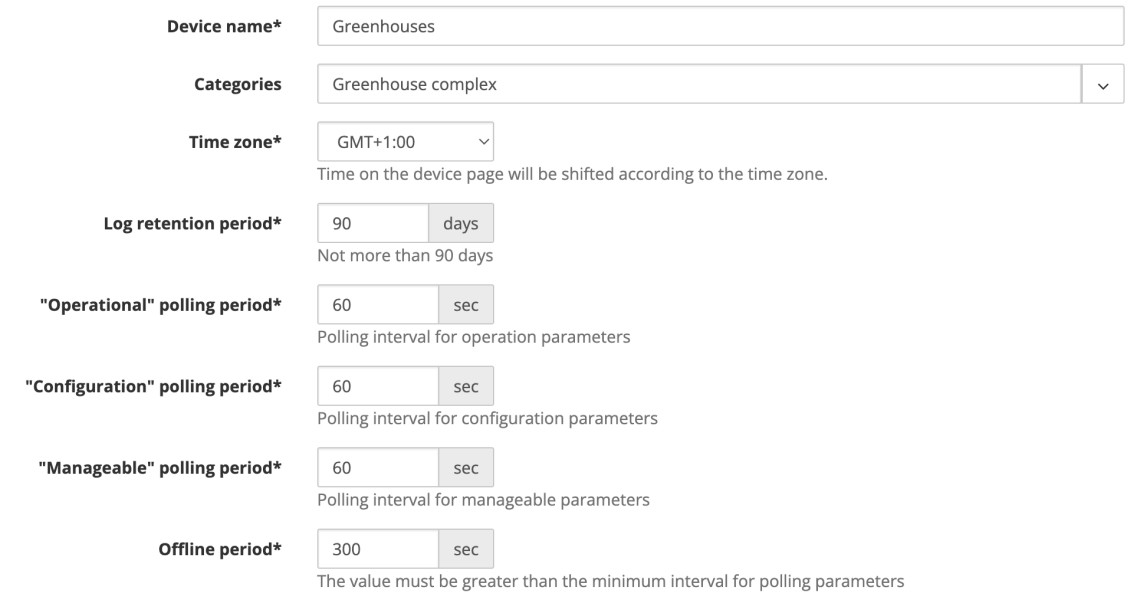


Current identifier is the number of the device connected to akYtec Cloud:
– Serial number of the GG-24–, GE-24–, GW-24– Cloud gateway
– Serial number of akYtec devices with Ethernet
– MAC address of the PLC / SPC connected via Ethernet

8.3.1 General device settings (basic settings)

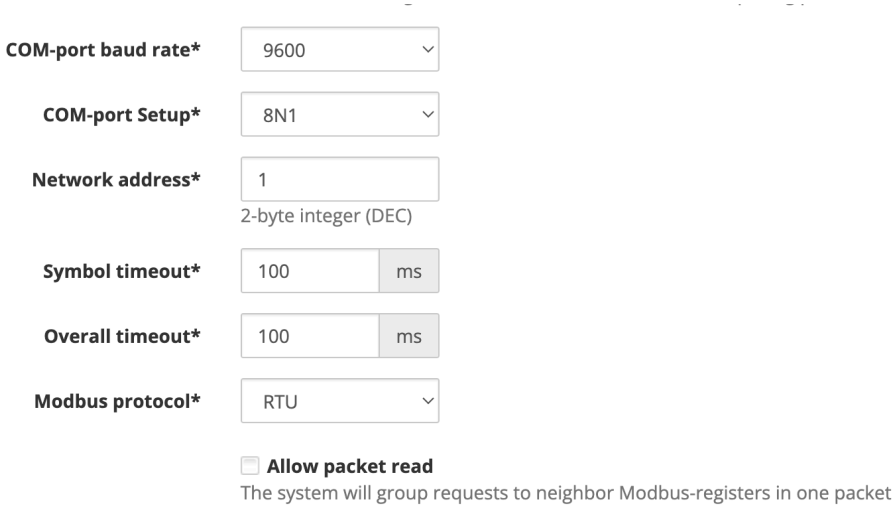
This section contains settings common to all devices.
Select **Basic settings / General settings** in the device settings. A window will appear:

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Device name – enter the name of the device to be displayed in akYtec Cloud.
Categories – select the groups to which the device belongs.
Time zone – select the time zone where the device is located. Reports based on this time zone will take the time parameters into account.
Log retention period – enter the retention time for data from the device. The maximum value is 90 days. This period defines how long each new record will be retained before being automatically deleted from the database. When a parameter value is changed, the new value applies only to the new events.
“Operational” polling period – set the polling period for operational parameters (see *Setting the device parameter types*).
“Configuration” polling period – set the polling period for configuration parameters (see *Setting the device parameter types*).
“Manageable” polling period – set the polling period for manageable parameters (see *Setting the device parameter types*).
Offline period – set the no response time from the device (gateway or Ethernet-connected devices), after which akYtec Cloud will register a "Device is offline" alarm. The value must be greater than the minimum of the three set polling periods.

8.3.1.1 Connection via gateway: RS485 interface and protocol settings



Network address – the address of the device connected to the Gx–24 gateway.
COM-port baud rate – set the COM port speed of the device connected to the Gx–24 network gateway.

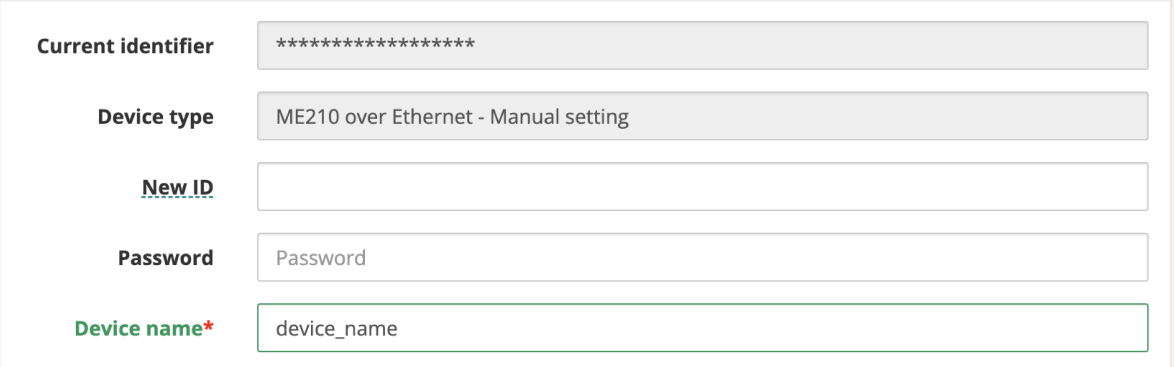
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COM-port Setup – select the COM port settings set for the device connected to the Gx–24 gateway:
– Number of information bits per byte of data. Possible options: 7, 8
– Parity mode. Possible options: N - none, E - even, O - odd
– Stop bits. Possible options: 1, 2.

Example:
8N1 - 8 data bits, no parity, 1 stop bit.

Symbol timeout – the waiting time for the next byte of data. The recommended value is 100 ms.
Overall timeout – the waiting time for the complete data packet to be received. The recommended value is 600 ms.
Modbus protocol – the protocol set for the device connected to the gateway. Possible options: RTU or ASCII.
Allow packet read – check the box to speed up data exchange (only if the connected device supports batch reading, as specified in the device user guide).

8.3.1.2 Direct connection via Ethernet

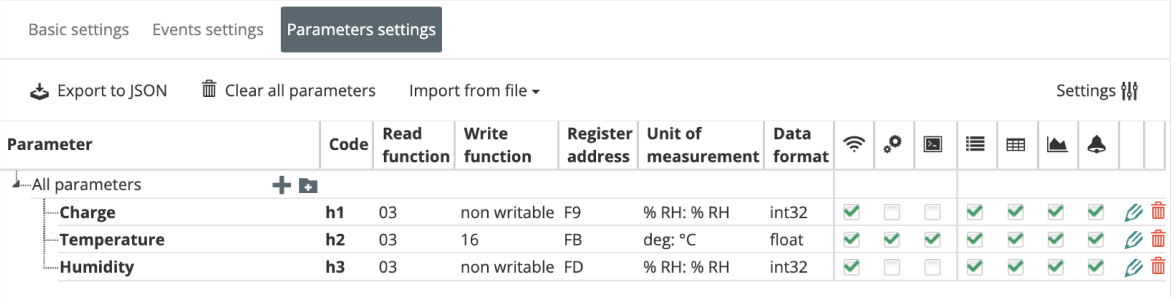


Authorization token – a key for authorization on the server for akYtec programmable devices in Codesys 3.5.
Password – the device access password set in akYtec Tool Pro.

8.3.2 Setting the device parameter types

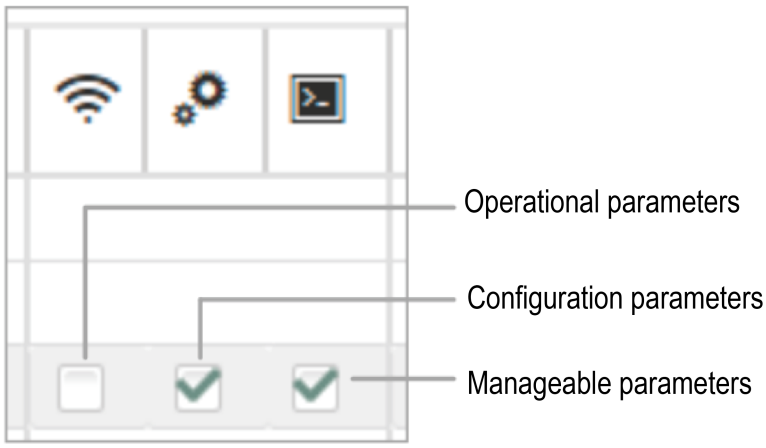
There are three types of parameters in akYtec Cloud:
– **Operational**: Parameters whose values change frequently and need to be monitored promptly.
– **Manageable**: Parameters that can be written to the device, such as parameter recording, template recording, configurations.
– **Configuration**: Parameters displayed on the ***Configuration*** tab. This is particularly useful, for example, for recipes when you want to change several parameters to predefined values at once.

Each parameter type has its own *polling period*.
Open the **Parameter settings** tab in the device settings. A window will appear:



Check the appropriate boxes for the device parameters:

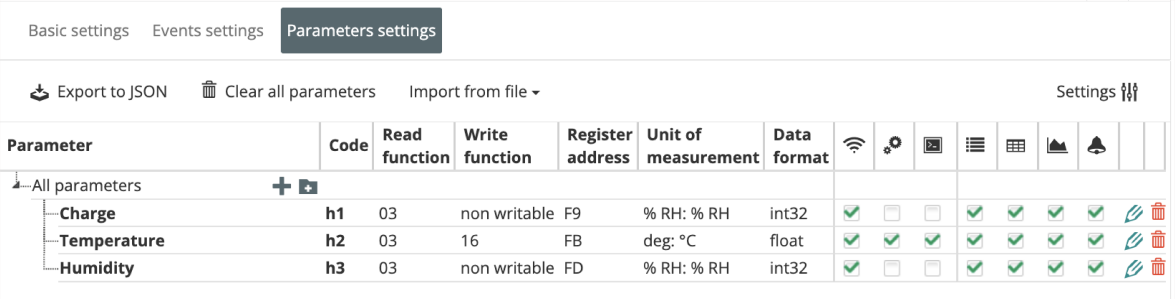
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8.3.3 Customizing the display of parameters in reports

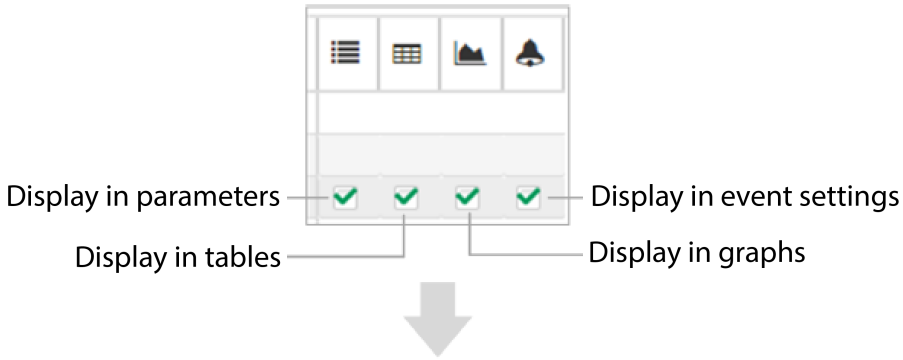
akYtec Cloud provides the following display settings:
– Enable or disable parameter display in reports.
– Change the order in which groups and parameters are displayed.

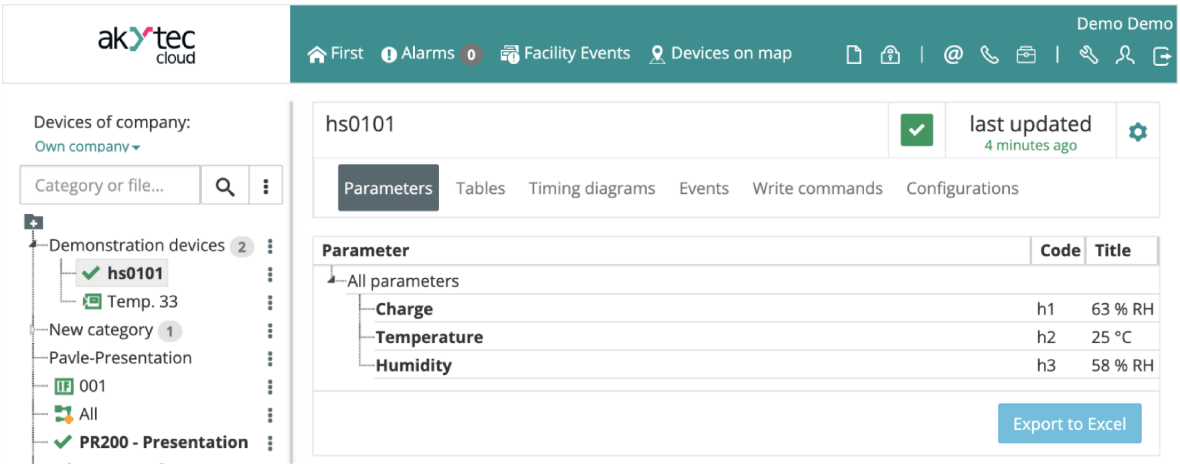
Enable/disable parameter display in reports
Open the **Parameter settings** tab in the device settings. A window will appear:



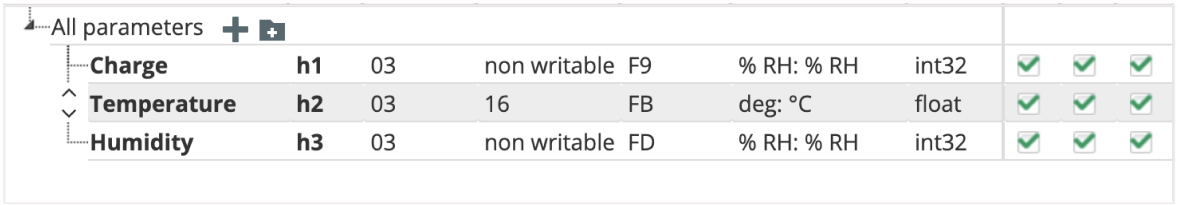
Check the appropriate boxes to display the device parameters in the reports:

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Change the order in which parameters are displayed
By default, the parameter list is sorted alphabetically. You can customize the order of parameters displayed in akYtec Cloud.
Open the **Parameter settings** tab in the device settings. Move the parameter using drag-and-drop or the arrows.

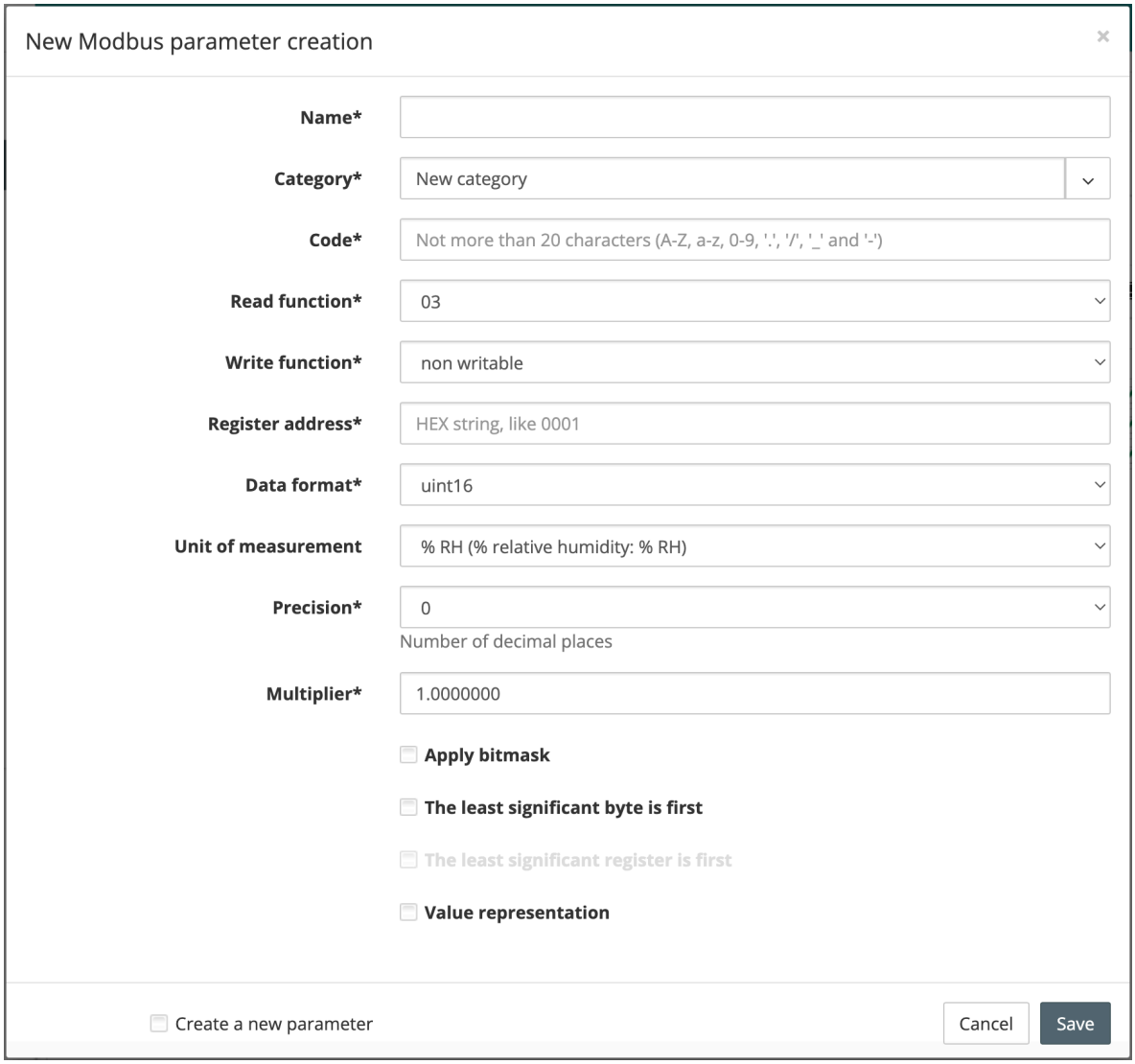


8.3.4 Device parameter settings when operating via Modbus protocol

Adding device parameters when operating via Modbus protocol.

Select **Parameter settings** in the device settings and click the **Create parameter** button. A window will appear:

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Name – enter the parameter name.
Category– select the group to which the parameter belongs.
Code– unique (in the device) designation of the parameter. The maximum size is 20 characters. Supported characters: "A"-"Z", "a"-"z", ".", "/", "-", and "_".
Read function – Modbus read function. Possible values:

- Non readable - The parameter is not read.
- 01 – Read Coil Status.
- 02 – Read Discrete Inputs.
- 03 – Read Holding Registers.
- 04 – Read Input Registers.

Write function– Modbus write function. Possible values:

- Non writable - The parameter is not written.
- 05 – Force Single Coil.
- 06 – Preset Single Register.
- 15 – Force Multiple Coils.
- 16 – Force Multiple Registers.

Register address – the address of the queried register in hexadecimal notation (HEX). For BOOL type variables, the bit address is specified.
Data format – storage format.

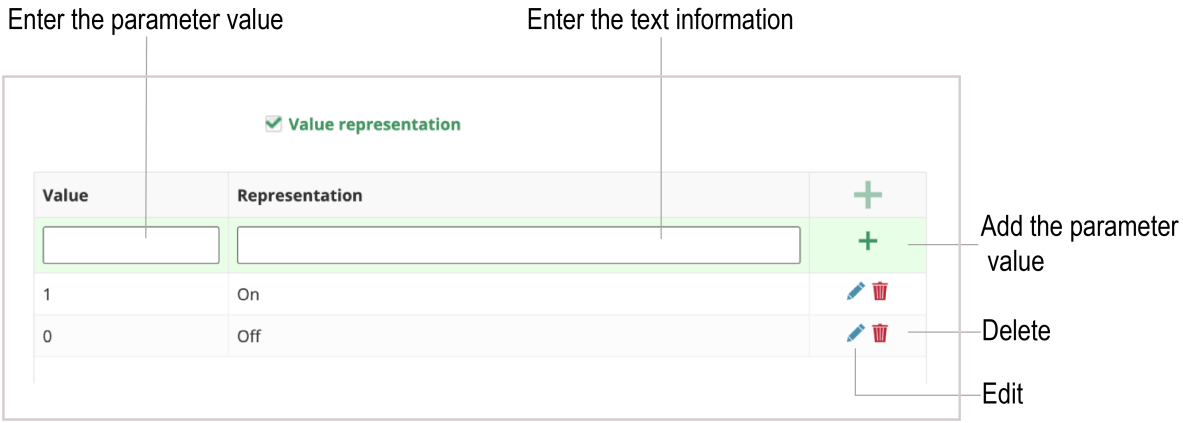
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Item No.	Data type in akYtec Cloud	Data type in Codesys
1	Bool	BOOL
2	Int16	INT
3	Int32	DINT
4	Int64	LINT (only in CODESYS V3.5)
5	Uint16	UINT/WORD
6	Uint32	UDINT/DWORD
7	Uint64	ULINT/LWORD (only in CODESYS V3.5)
8	Float	REAL
9	Double	LREAL (only in CODESYS V3.5)

Unit of measurement – the unit of measurement of the parameter displayed in reports.
Precision – number of decimal places (0...5).
Multiplier (for numeric data types only) – the scaling factor by which the parameter value is multiplied. Set in the following cases:

– Calculations in the process of checking the conditions of event registration.
– Displaying the parameter value in the service interface.
– Transferring the parameter value in an API method.

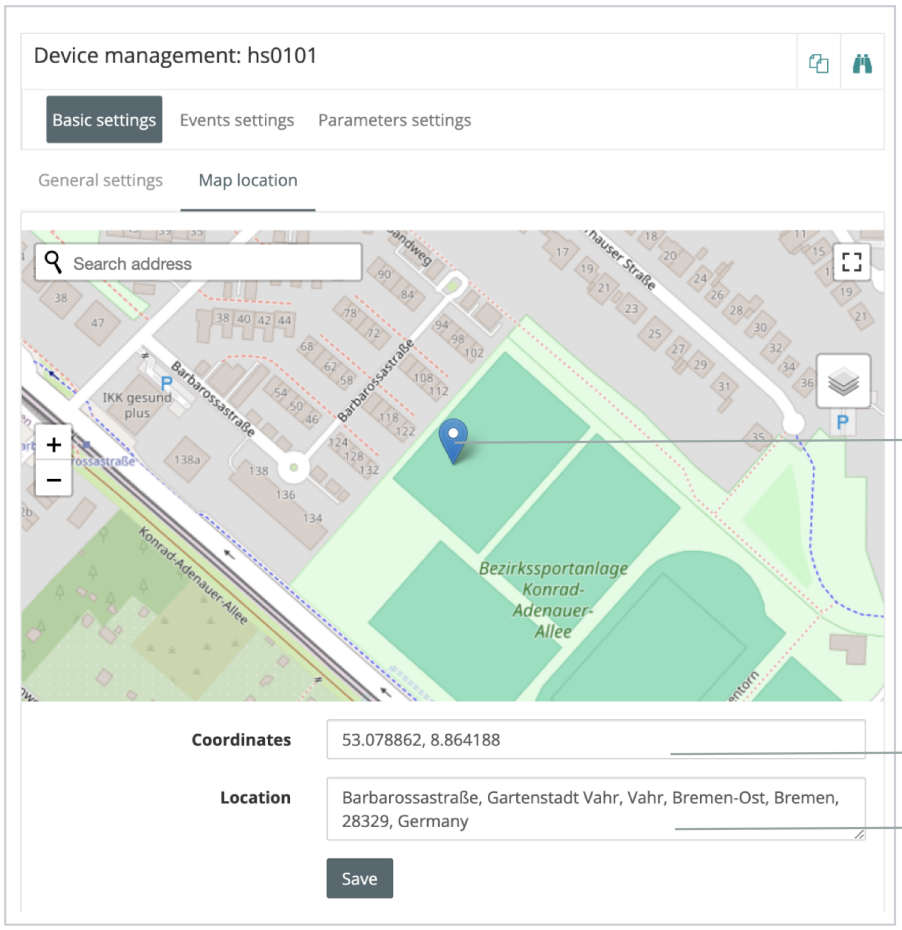
When writing a parameter with a multiplier, the value divided by the multiplier is transmitted to the device. Rounding with a given accuracy is performed after multiplication.
Apply bitmask (only for integer data types) – check the box to extract the selected bit from the specified parameter.
Byte and register order settings are applied to the parameter before the bit mask is applied.
Byte order: little endian – check the box to store the bytes in least significant byte first order.
Register order: little endian – check the box to read registers (occupying more than one) in the least significant register first order.
Value representation – check the box to assign text information to the different values of the parameter. In the reports, the parameter values will be replaced with the corresponding text information.



8.3.5 Setting the device map location

Select **Basic settings/ Map location** in the device settings. A window will appear:

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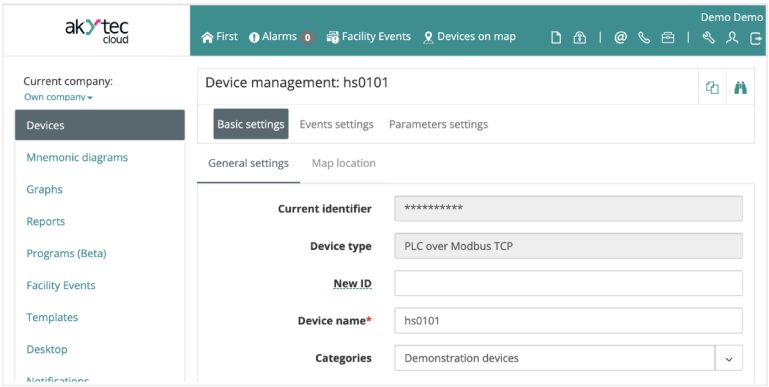
Specify the device's location on the map and click the **Save** button.

8.4 Device copy

The device copying is intended for quickly duplicating devices of the same type. The following settings are saved when copying:

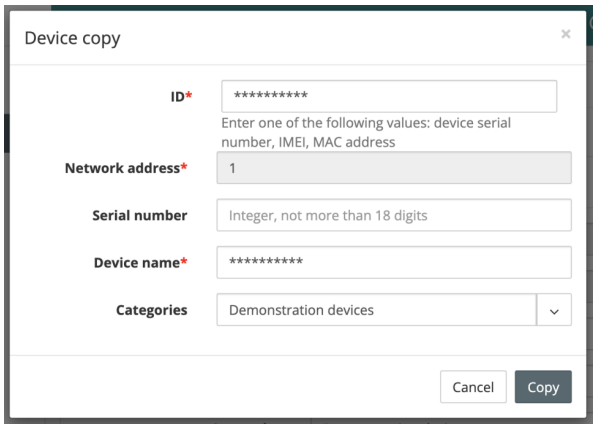
– Device characteristics
– Parameter settings (list, type, visibility in reports)
– Device events.

Open the **Devices** tab in the **Administration** section. Select the device whose settings you want to copy.



Press the device copy button. A window will appear:

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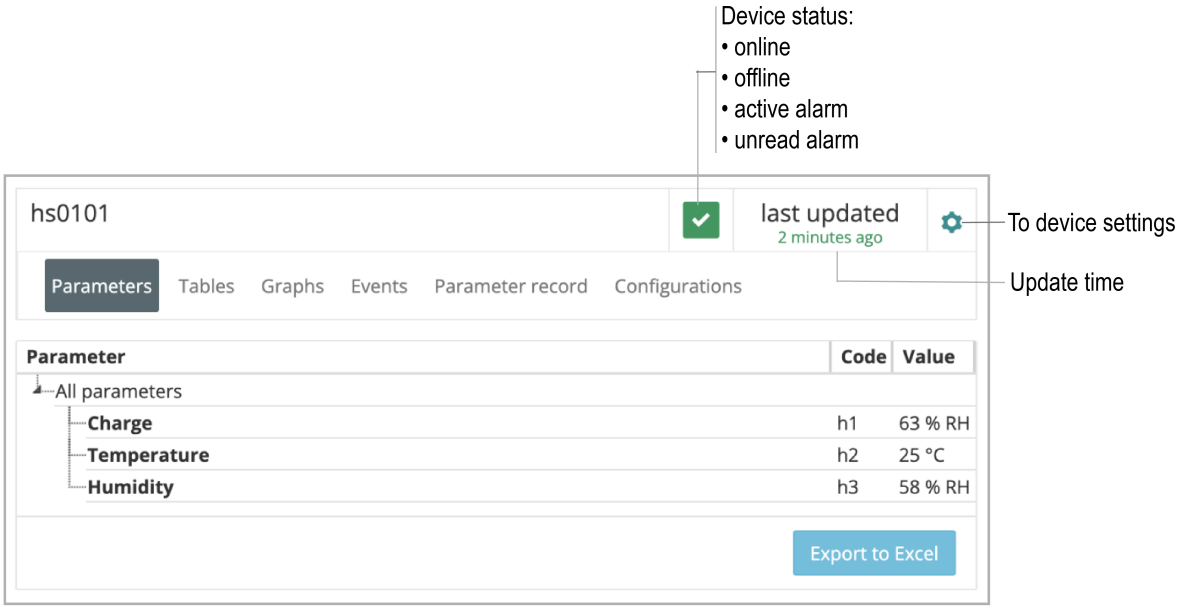
Fill in the device 's unique settings and click the **Copy** button.
A window with the device settings will open. Make the necessary changes and press the **Save** button.

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9 Monitoring and analysis

9.1 Viewing the current device data (Parameters)

The **Parameters** report allows you to view the current values of the updated device parameters. In the main akYtec Cloud window, select the device and open the **Parameters** tab. A window will appear:



Parameter values are updated automatically, the data update frequency depends on the type the type of parameter (operational, configuration, manageable) and the polling periods set for them (see *Section 8.3.1*).
The parameters displayed in the report are determined by the **Device Parameter Settings** under **Display in Parameters** (see *Section 8.3.3*).
You can enable or disable the display of parameter codes in your *user profile*.
If an error occurs while retrieving a parameter value, the corresponding error code will be shown Error code descriptions for the akYtec protocol are provided in the protocol documentation, while descriptions for the Modbus protocol are given in the table below.

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Table 9.1 Errors generated by akYtec Cloud service

Code	Error	Description
253	NOT-A-NUMBER (NaN)	Error in converting received data into float or double numbers. The main causes of a NaN error: – Any non-trivial mathematical operation with NaN as one of the operands – Division by zero – Taking the square root of a negative number – Calculating logarithm of a negative number – Raising zero to the zero power
255	TIMEOUT	No device response within the timeout period **Overall timeout** parameter). This code is not described in the Modbus protocol specification. Error code 255 occurs when there is no response from the device to a query from akYtec Cloud. If an error occurs for more than one parameter: – Modbus register addresses are set incorrectly for these parameters – The selected Modbus functions are not supported by the device – The timeout value set exceeds the response time of the device If an error occurs for all parameters: – The network settings (protocol, baud rate, parity) in the akYtec Cloud service are incorrect – The device address (Slave ID) is set incorrectly – Modbus register addresses are set incorrectly – The selected Modbus functions are not supported by the device – The set timeout value exceeds the response time of the device – Communication line problems (e.g., D+ and D- are mixed up, cable break, a cable other than twisted pair is used) – 120 Ω terminating resistors are not installed at the ends of the line

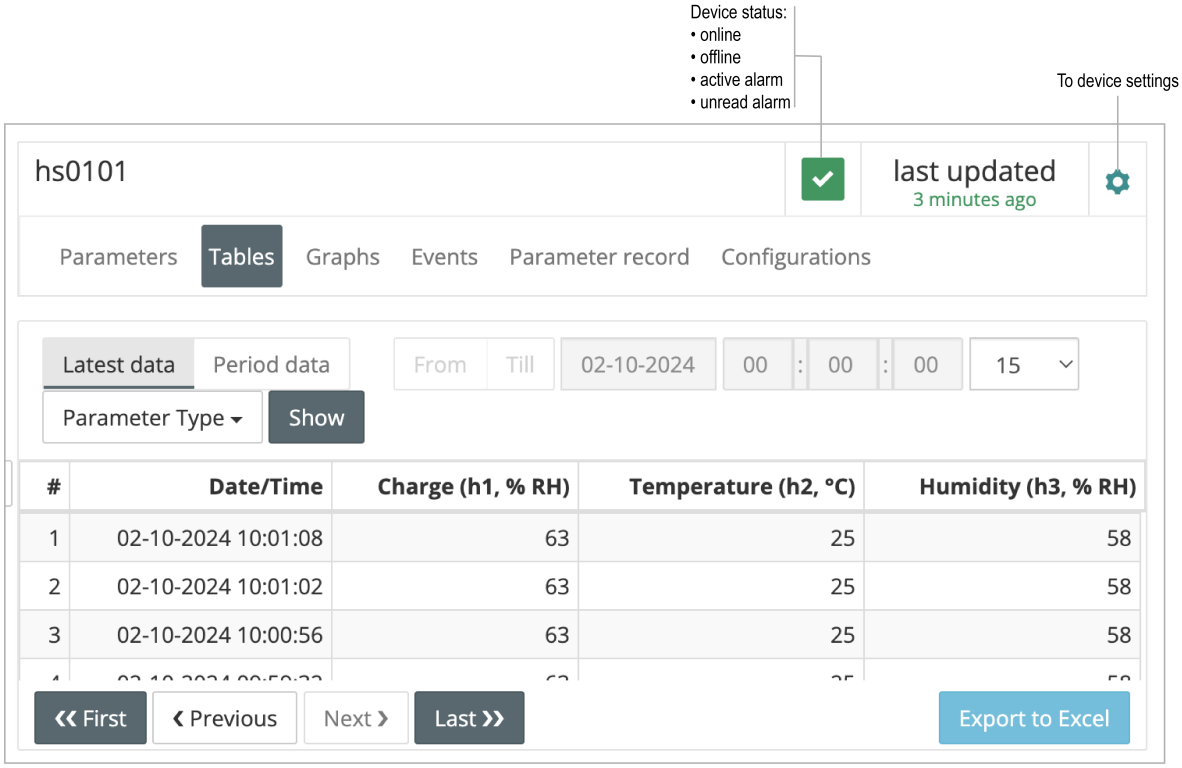
Table 9.2 Description of error codes for Modbus protocol

Code	Error	Description
1	ILLEGAL FUNCTION	The slave device does not support the Modbus function specified in the request.
2	ILLEGAL DATA ADDRESS	The slave device does not contain one or more registers specified in the request.
3	ILLEGAL DATA VALUE	The value in the data field does not conform to the Modbus protocol e.g., the values in the data field are different from 0x0000 or 0xFF00 when using the 05 Write Single Coil function.
4	SERVER DEVICE FAILURE	An internal error occurred in the slave device while executing the request.
5	ACKNOWLEDGE	The Slave device has accepted and is processing the request, but this will take some time. The response helps prevent the master device from generating a timeout error.
6	SERVER DEVICE BUSY	The Slave device is processing another command. The Master device should repeat the request later.

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9.2 Viewing the device data in table form

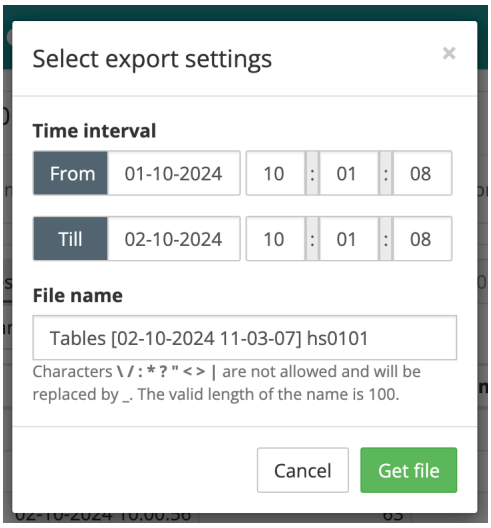
The device data in table format allows you to view detailed values of the device's parameters for the past 3 months, and also to export these values to Excel.
In the main akYtec Cloud window, select the device and open the **Tables** tab. A new window will appear:



To specify the time interval of data to display in the report, select **Latest data** or **Period data**, and set the appropriate values in the **From** and **Till** fields. Then click the **Show** button.
To set which parameters are displayed in the report, go to the **Device parameter settings / Display in tables** (see *Section 8.3.3*).
You can enable or disable the display of the parameter code in the *user profile*.
If you need to enable or disable the visibility of a group or specific parameters, use the **Parameter Type** filter. The filter settings are saved to the user account.
The time limitation for data available in the report is set in the **Basic device settings / Log retention period** (see *Section 8.3.1*).
To export the table to an Excel file:

1. Click the **Export to Excel** button.
2. In the window that opens, select the **Time interval** and specify the **File name**:

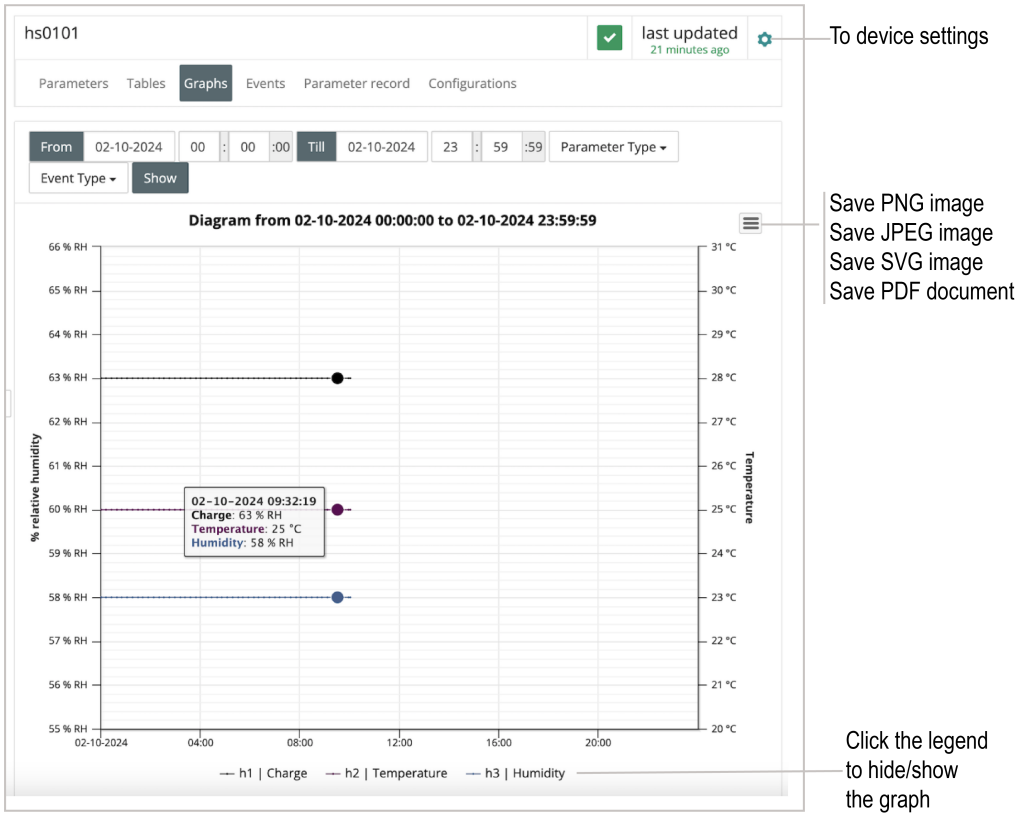
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3. Click the **Get File** button. The table will be saved in Excel format.

9.3 Viewing the device data in graph form

Graphs allow you to visualize changes in parameter values and device events in graphical form. In the main akYtec Cloud window, open the **Graphs** tab. A new window will appear:



Color explanation:

– Grey vertical line: No data from the device
– Blue vertical line: Event start and end
– Red vertical line: Alarm start.

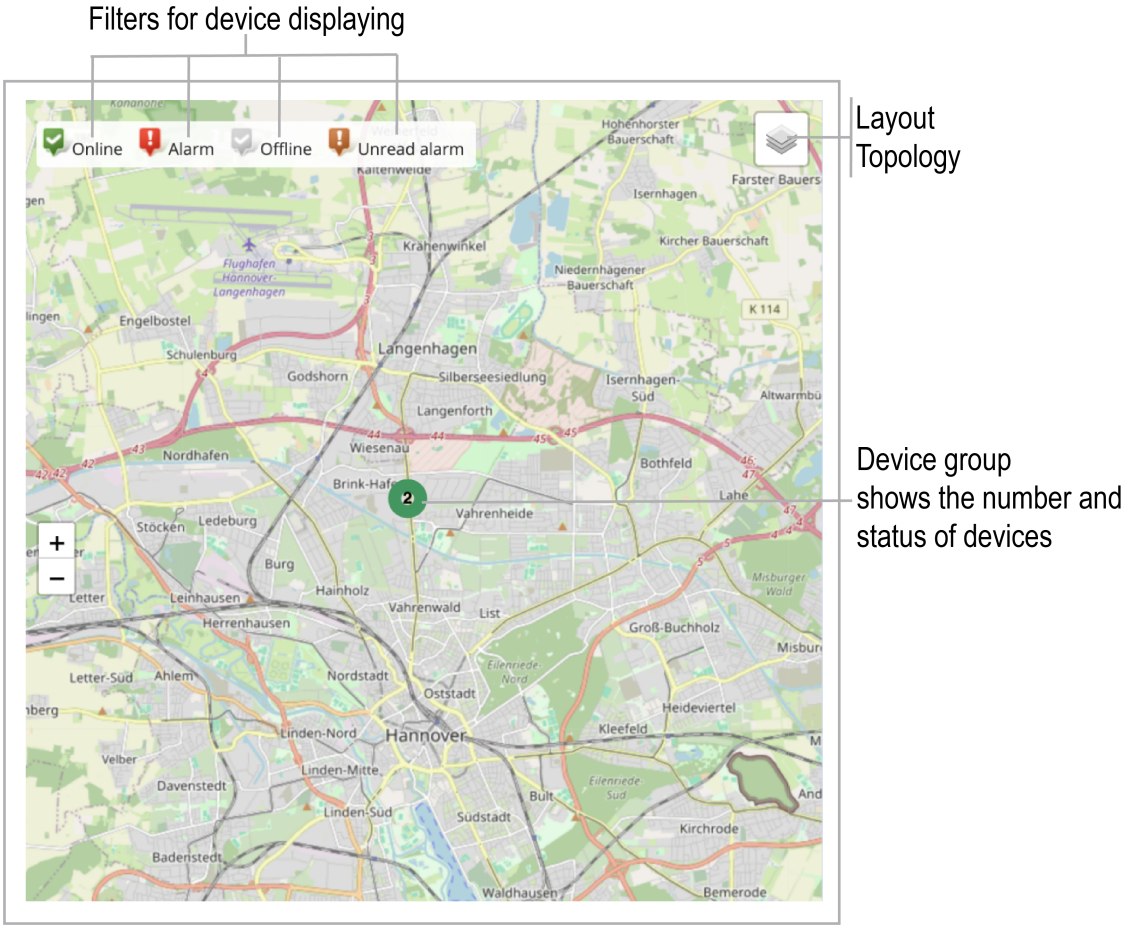
To specify the time interval of data to be displayed in the graph, set the appropriate values in the **From** and **Till** fields, then click the **Show** button.
If necessary, you can zoom in on the graph. To do this, highlight the part of the graph you want to zoom in on by holding down the left mouse button.

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To set the parameters to be displayed in the graph, go to **Device parameter settings/Display on graphs** (see *Section 8.3.3*).
You can enable or disable the display of parameter codes in the *user profile*.
If you want to enable or disable the visibility of parameters and events, use the **Parameter type** and **Event type** filters. These filter settings are saved for the user account.

9.4 Viewing the device map location

The map displays the location and status of devices directly connected to akYtec Cloud. For devices connected via the Gx–24 gateway, only the gateway status will be shown.
In the main akYtec Cloud window, click the **Devices on map** link. A new window will appear:



The location of devices on the map is set during device setup (see *Section 8.3.3*).

9.5 Facility visualization (mnemonic diagrams)

Facility visualization allows you to display a process map using a library of pre-made animated mnemonic symbols.
When visualizing a facility, you can display:

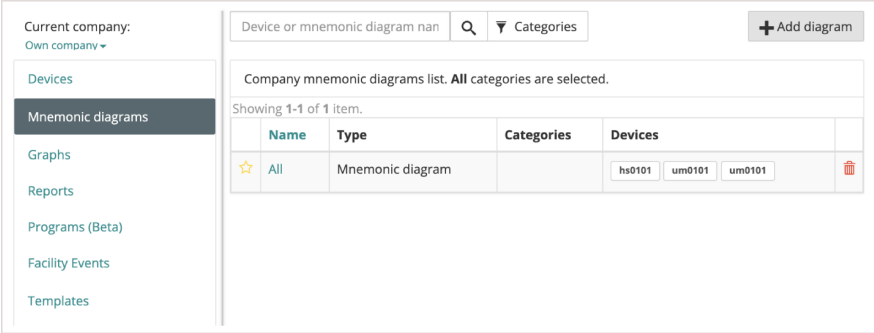
– A static or animated image e.g., a photo or screenshot from any editor
– Text
– Parameter values
– Facility control (writing parameters to the device)
– Alarm events using signaling elements (circle, square, data element)
– Elements of technological process visualization.

Access to and the number of mnemonic diagrams depend on user privileges (see *Section 12*).
To display mnemonic diagrams, the user must have access to the devices and templates used in the diagram.

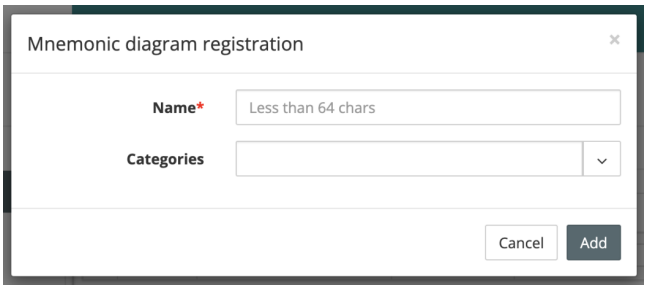
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9.5.1 Creating a mnemonic diagram

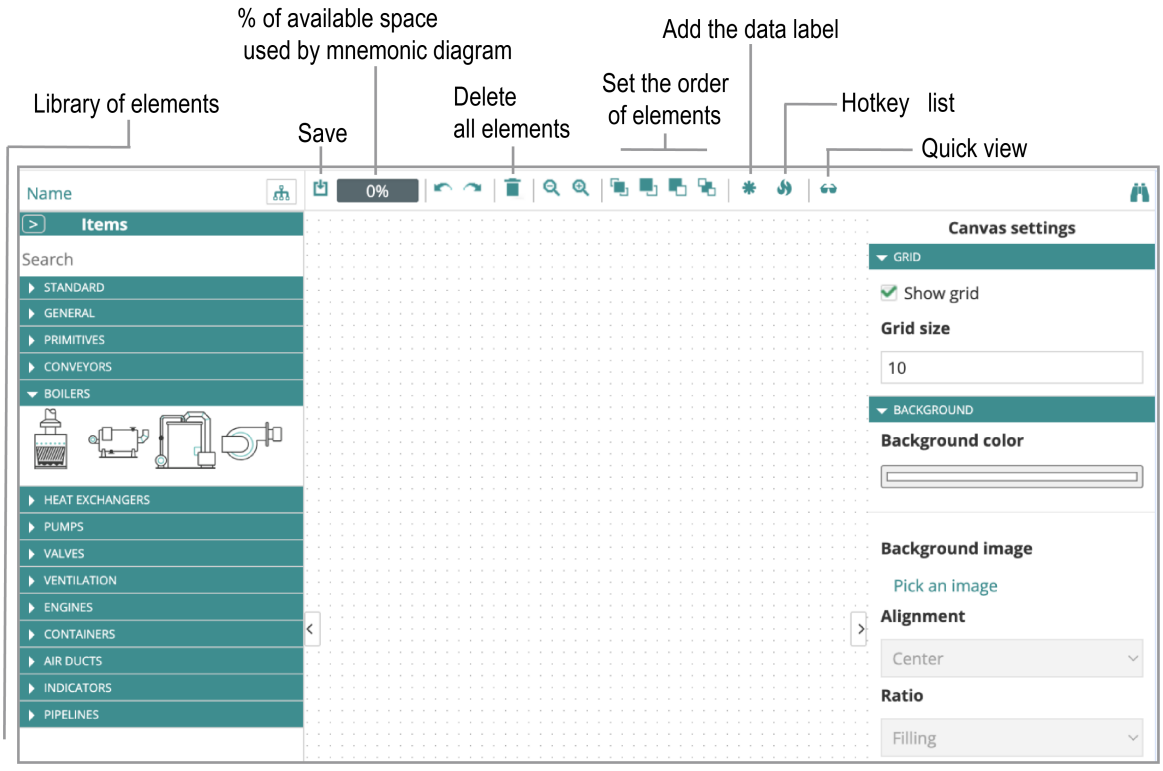
Open the **Mnemonic diagrams** tab in the **Administration** section. A new window will appear:



Click the **Add diagram** button. Another window will appear:



Name – enter / change the mnemonic diagram's name.
Categories – select the groups to which the mnemonic diagram will belong.
Click the **Add** button. The visualization editor window will appear:



Select an item from the library and drag it onto the canvas while holding down the left mouse button.

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9.5.1.1 Canvas settings

If necessary, set the following canvas characteristics:

– Under **Canvas settings / Grid**:

  Show grid: Check the box to display the grid

  Grid size: Set the grid step value.

– Under **Canvas settings / Background**:

  Background color: Select the background color for the canvas or set a background image

  Background image: If needed, add an image by clicking the **Pick an image** link. The maximum file size is 1 MB. Supported formats: png, jpg, .svg, .gif and .svg. Set the following parameters for the image:

  – **Alignment**: Choose the alignment of the image relative to the canvas. Possible options: left, center, right

  – **Ratio**: Select the type of fill

  – **Opacity**: Set the image transparency

  – **Canvas size**: Set the size of the canvas in pixels.

9.5.1.2 Static or animated image (Image)

To display an image or animated picture, select the **Image** item in the **Standard** group.
If necessary, set the following image characteristics:

– **Dimensions** : Set the width, height, rotation angle and position on the canvas;

– **Pick an image** — the maximum file size is 1 MB. The following formats are supported: png, .jpg, .svg, .gif and .svg. Set the following parameters for the image:

  – **Alignment**: Choose the alignment of the image relative to the canvas. Possible options: left, center, right

  – **Ratio**: Select the type of fill

  – **Opacity**: Set the image transparency

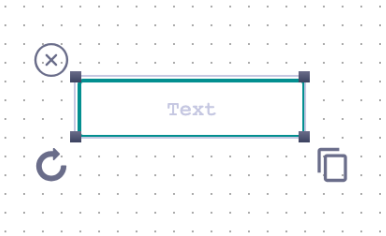
  – **Save ratio**: Check the box to preserve the image's aspect ratio. If unchecked, the image will stretch to fit the size of the item without maintaining the aspect ratio.

9.5.1.3 Text

If necessary, set the following item characteristics:

– **Representation:** Set the contour, fill, contour thickness, and contour type.

– **Text:** Set the color, size, thickness, and text content.



9.5.1.4 Displaying the parameter value (Data)

Select **General / Data** to display the value of the parameter. If necessary, set the following item characteristics:

– **Dimensions:** Set the width, height, rotation angle, and position on the canvas.

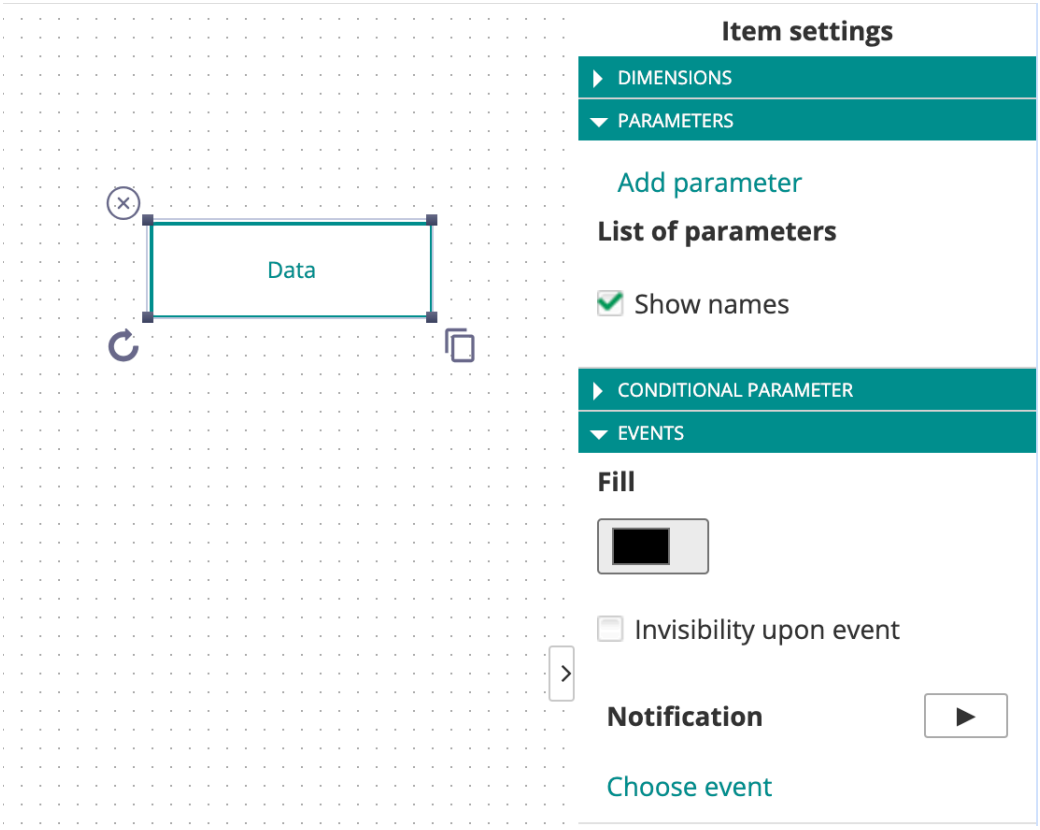
– **Parameters:** Select the parameter and check the box to **Show names**.

– **Events:** When an event is triggered, the Data object turns red.

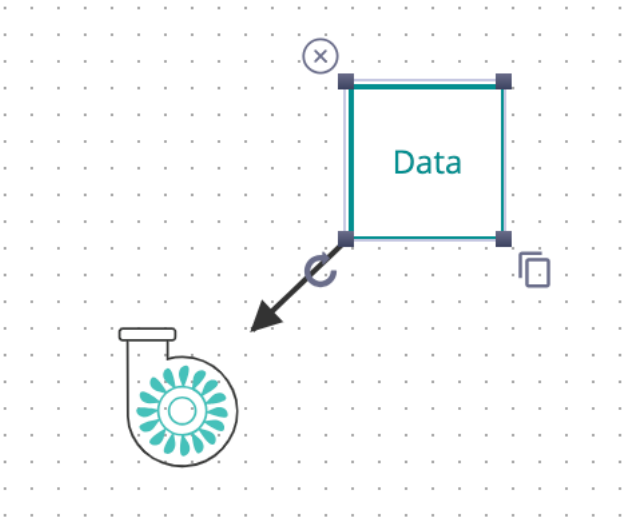
– **Representation:** Set the contour, fill, contour thickness, and contour type.

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– **Text:** Set the color, size, thickness, and text content.



To add a data label, select the item and click the **Add label** button. Click on the **Data** item and select **Events** in the item's settings to display on the label:

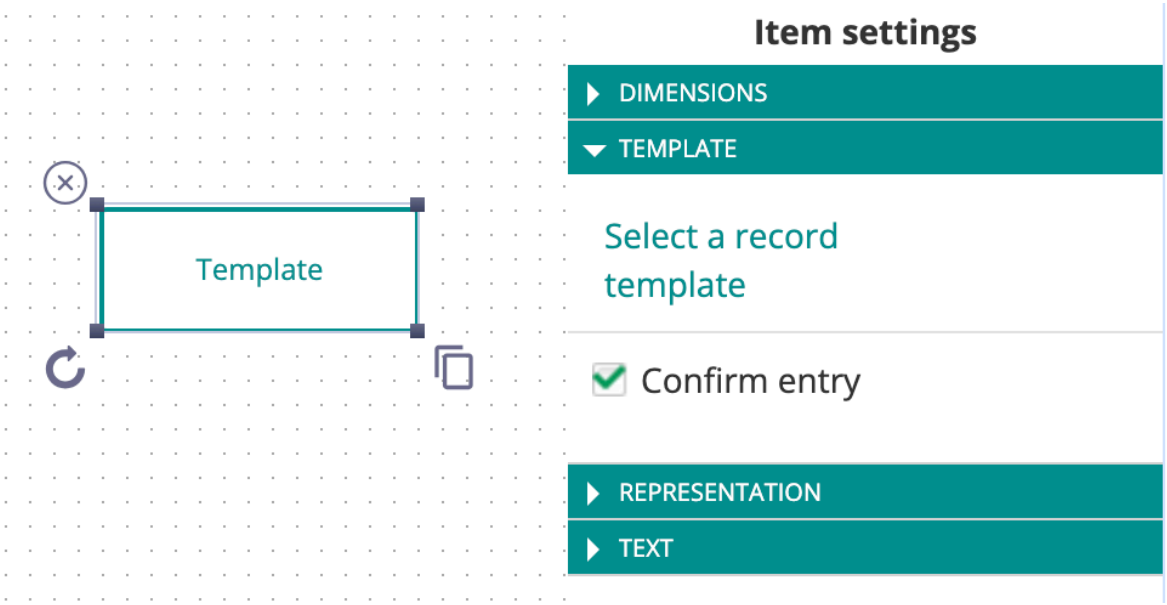


9.5.1.5 Facility control, parameter writing (Write template)

To create a control item, select **General / Template**. If necessary, set the following item characteristics:

– **Dimensions:** Set the width, height, rotation angle, and position on the canvas.
– **Write template:** Select the template to write, and check the box to **Confirm entry**.
– **Representation:** Set the contour, fill, contour thickness, and contour type.
– **Text:** Set the color, size, thickness, and text content.

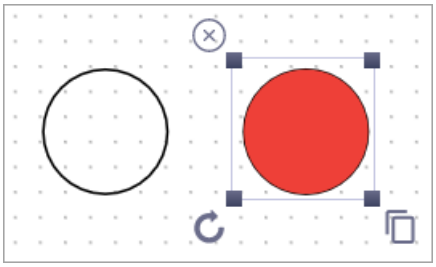
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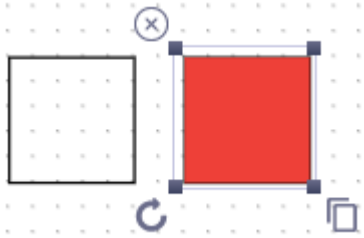


9.5.1.6 Alarm items: signal circle / signal square

To display an item that shows an alarm, select **General / Signal circle** or **Signal square**. If necessary, set the following item characteristics:

- **Dimensions:** Set the width, height, rotation angle, and position on the canvas.
- **Events:** Select an event to display by clicking the **Choose event link**. The fill color depends on the event status (transparent or red).



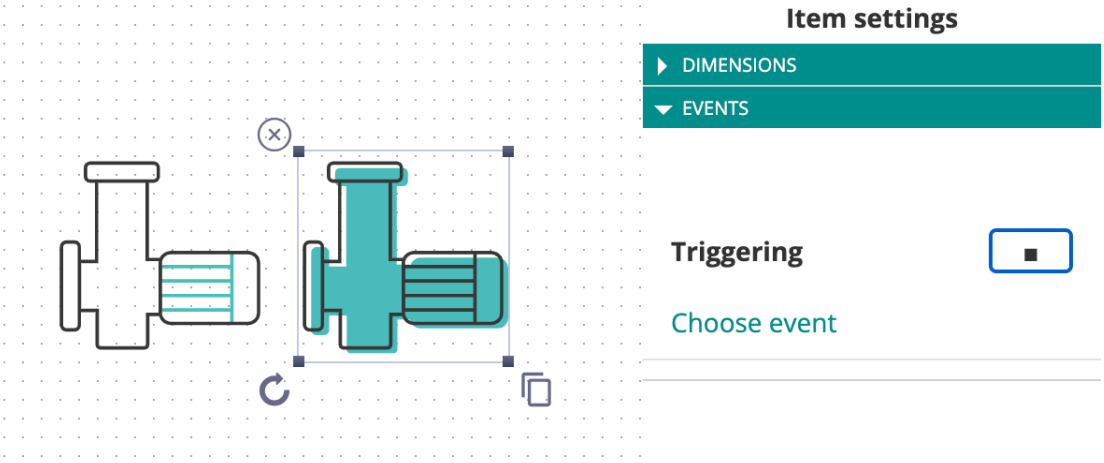


9.5.1.7 Process visualization items

If necessary, set the following item characteristics:

- **Dimensions:** Set the width, height, rotation angle, and position on the canvas.
- **Events:** Select the event corresponding to the technological process (enabled / disabled):
  - Event = 0: No triggering; the item has a transparent fill.
  - Event = 1: Triggering detected; the item has a transparent green fill, and some items are animated (they rotate when the event is triggered).

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General view of the process items library:

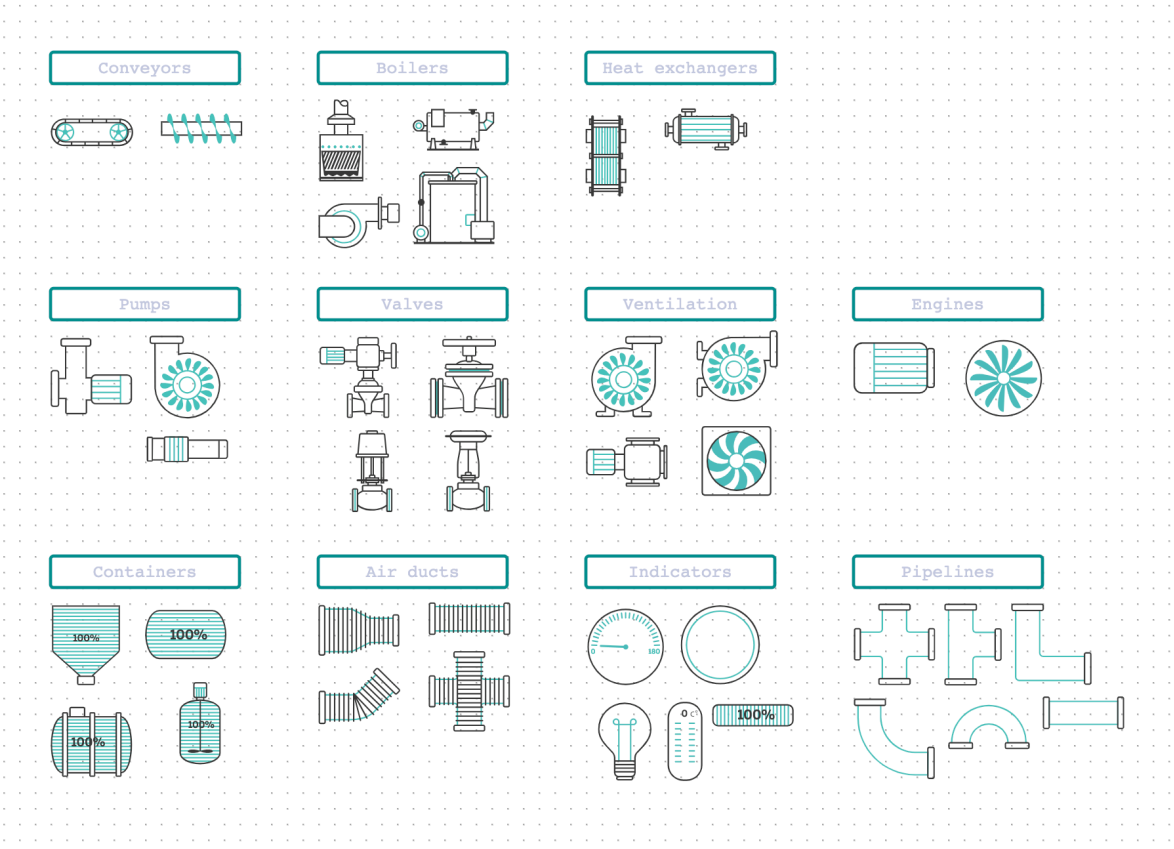


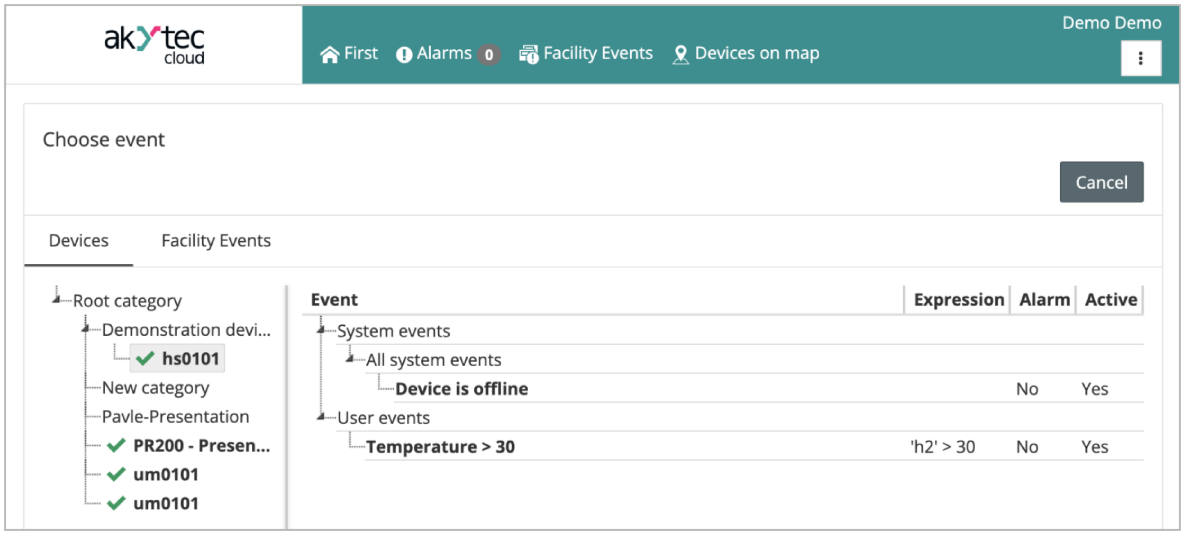
Table 9.3 Hotkeys used with mnemonic diagrams

Item No.	Key combination	Description
1	Hold Shift and circle a group of items with the left mouse button	Select a group of items.
2	Ctrl + C	Copy the selected item to the clipboard.
3	Ctrl + V	Paste the selected item from the clipboard.
4	Ctrl + X or Shift + Delete	Cut the selected item to the clipboard.
5	Delete or Backspace	Delete the selected item.
6	Ctrl + Z	Undo the last action.

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Item No.	Key combination	Description
7	Ctrl + Y	Redo the last canceled action.
8	Ctrl + S	Save the mnemonic diagram.
9	Ctrl + Plus	Zoom in on the mnemonic diagram.
10	Ctrl + Minus	Zoom out of the mnemonic diagram.
11	Hold Shift and scale the item	Resize the item while maintaining its proportions.
12	Ctrl + up, down, left, right arrows	Resize the element's width/height.
13	Shift + up, down, left, right arrows	Change the position of the item relative to the canvas.

In the **Item settings/ Event** section, click the **Choose event** link. A new window will appear:

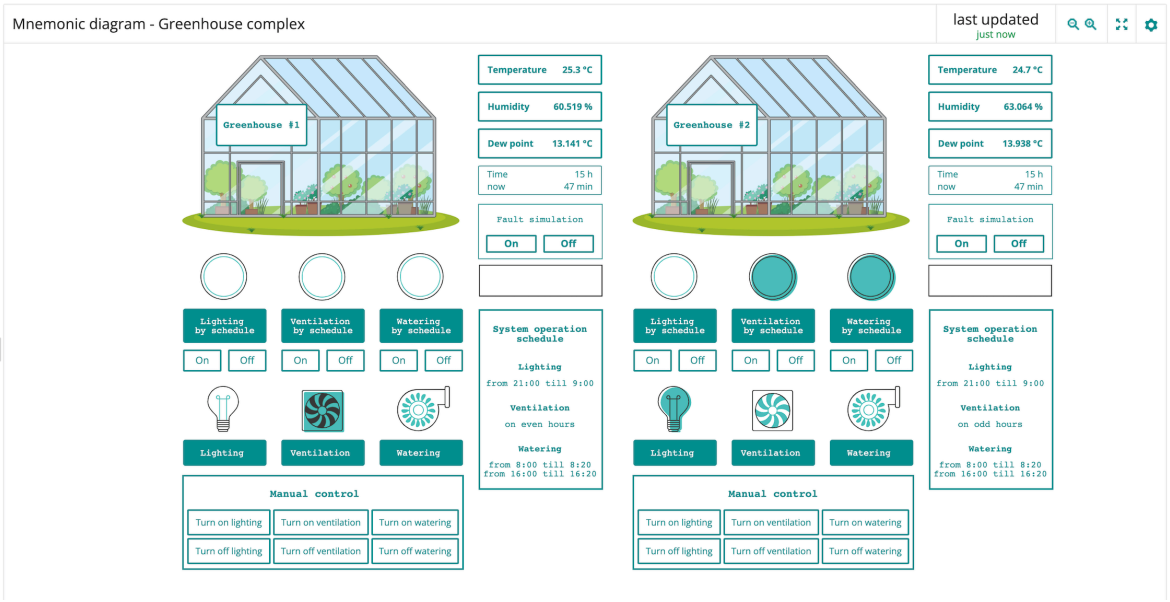


In the **Devices or Facility events** tab, select the device and corresponding device/facility event to assign to the item.

9.5.2 Viewing the mnemonic diagram

Select a mnemonic diagram in the main akYtec Cloud window. A new window will appear:

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While viewing the mnemonic diagram, the visualization items display the values of the bound parameters and events, as well as control elements.

9.6 Custom graphs

Two types of graphs are available to the user for analyzing data from one or more devices:

– **Custom graph:** Allows you to monitor parameters and events for up to 90 days (see *View a custom graph, trend, or event diagram*).
– **Trend:** Provides real-time monitoring of parameter interactions from **different devices** on an **auto-updating** for a period of up to 60 minutes (see *View a custom graph, trend, or event diagram*).
– **Event diagram:** Displays information on device or facility events in the form of a Gantt chart for a specified period. The event diagram lets you visually compare the registration time and duration of events (see *View a custom graph, trend, or event diagram*).

Custom graphs provide:

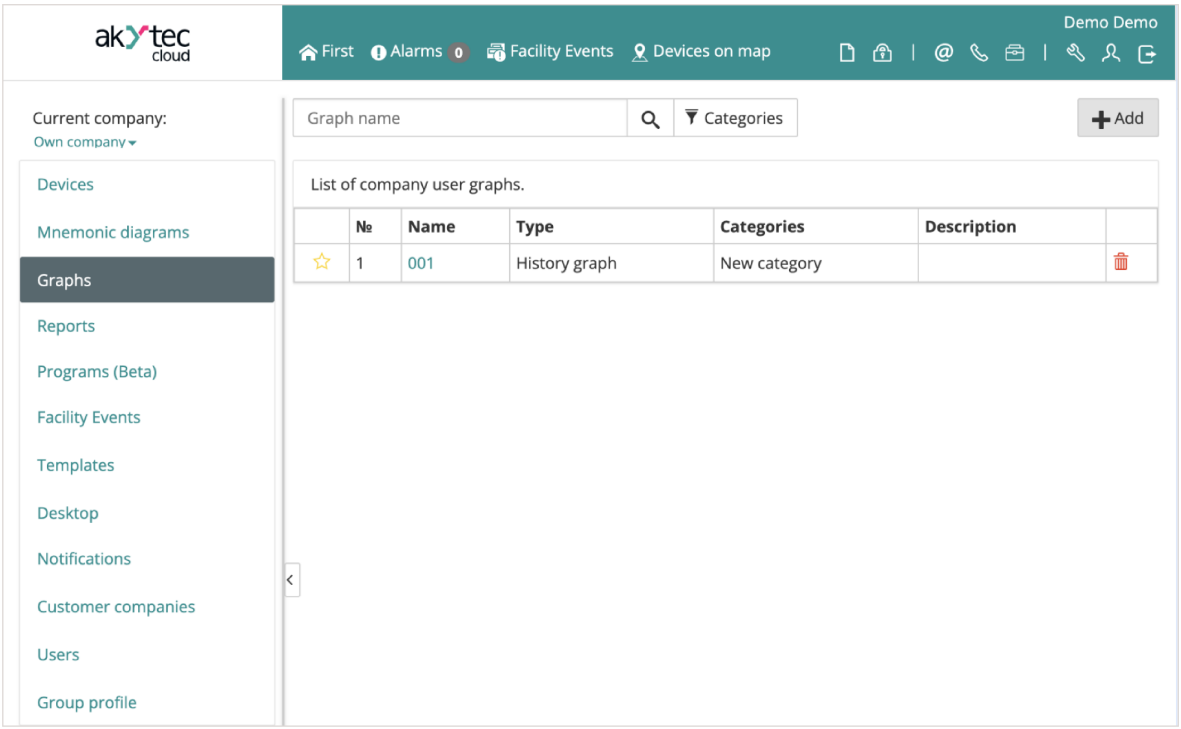
– Quick visual comparison of the operation of the same type of equipment.
– Monitoring and comparison of important event triggers.
– The ability to create personalized reports for each user (installer, dispatcher).

The number of custom graphs available to the user is determined by *user rights*.

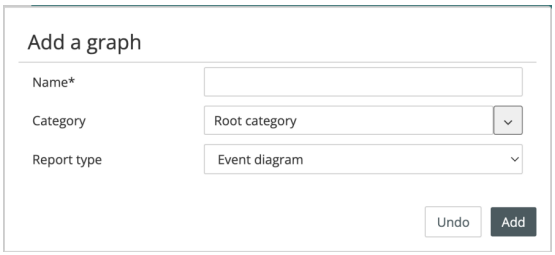
9.6.1 Adding a custom graph, trend or event diagram

Open the **Graphs** tab in the **Administration** section. A new window will appear:

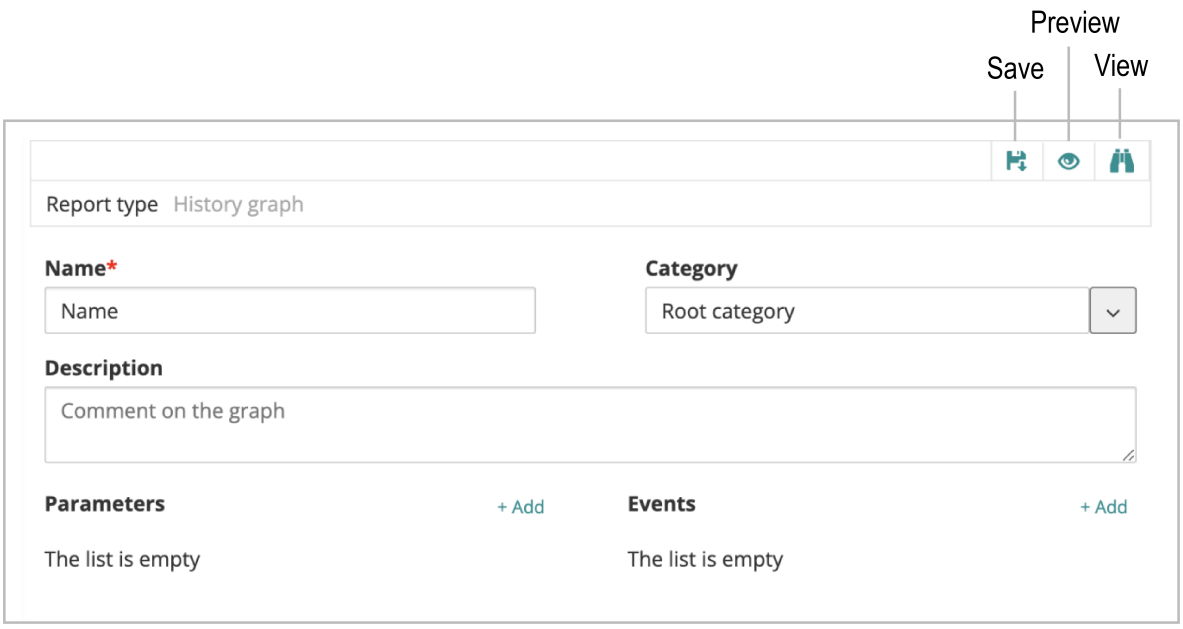
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Click the **Add** button. Another window will appear:

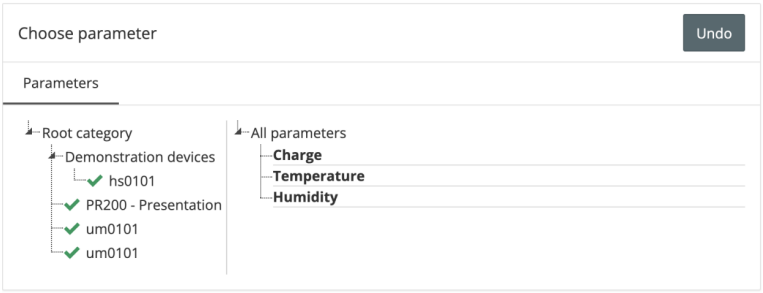


Name – enter a name for the custom report.
Category – select the group to which the custom graph will belong.
Report type — choose the type of report (graph, trend, or event diagram).
Click the **Add** button. A list of the company's custom graphs will open. Click on the name of the added report. A window will appear:

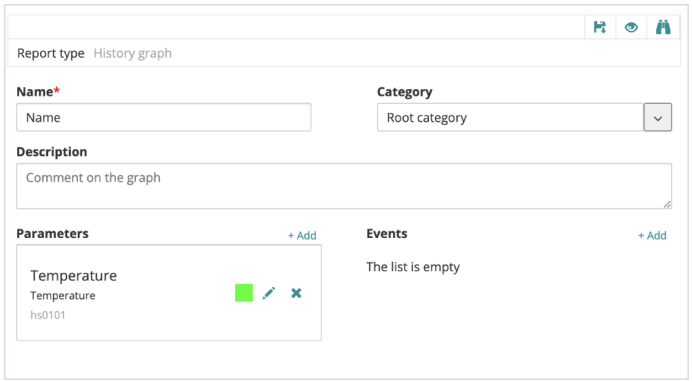


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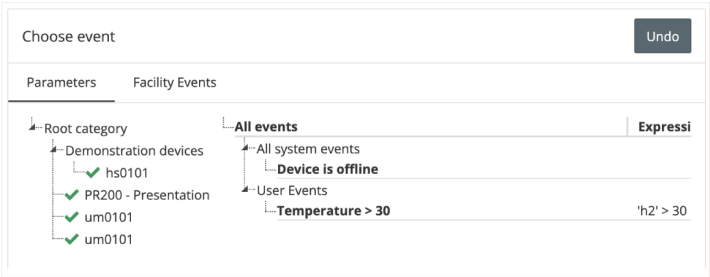
The **Parameters** field is displayed only for the Graph or Trend report types.
Parameters – select the parameters to plot on the graph. Click the **Add** link. A window will appear:



Select the device and the device parameter. A window will appear:

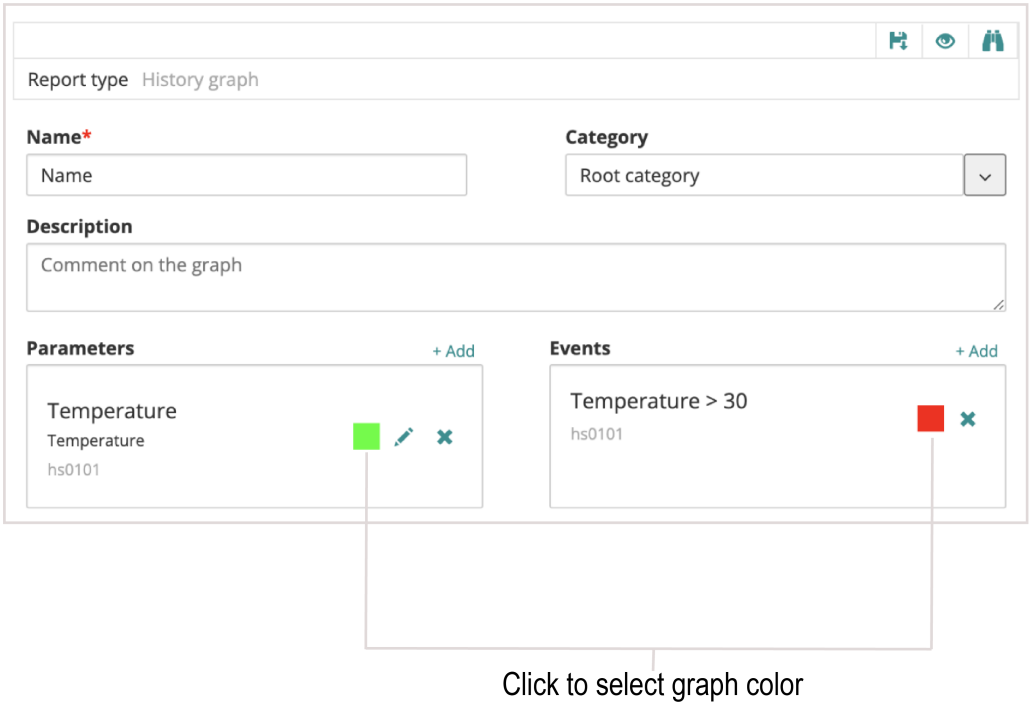


Events – select the events to plot. Click the **Add** link. A window will appear:



Open the **Devices** or **Facility events** tab and select the events to include in the report. A window will appear:

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Click the save report button.

9.6.2 Viewing a custom graph, trend, or event diagram

Select a graph, trend, or event diagram in the main akYtec Cloud window.

– When you select a graph, a new window will appear:

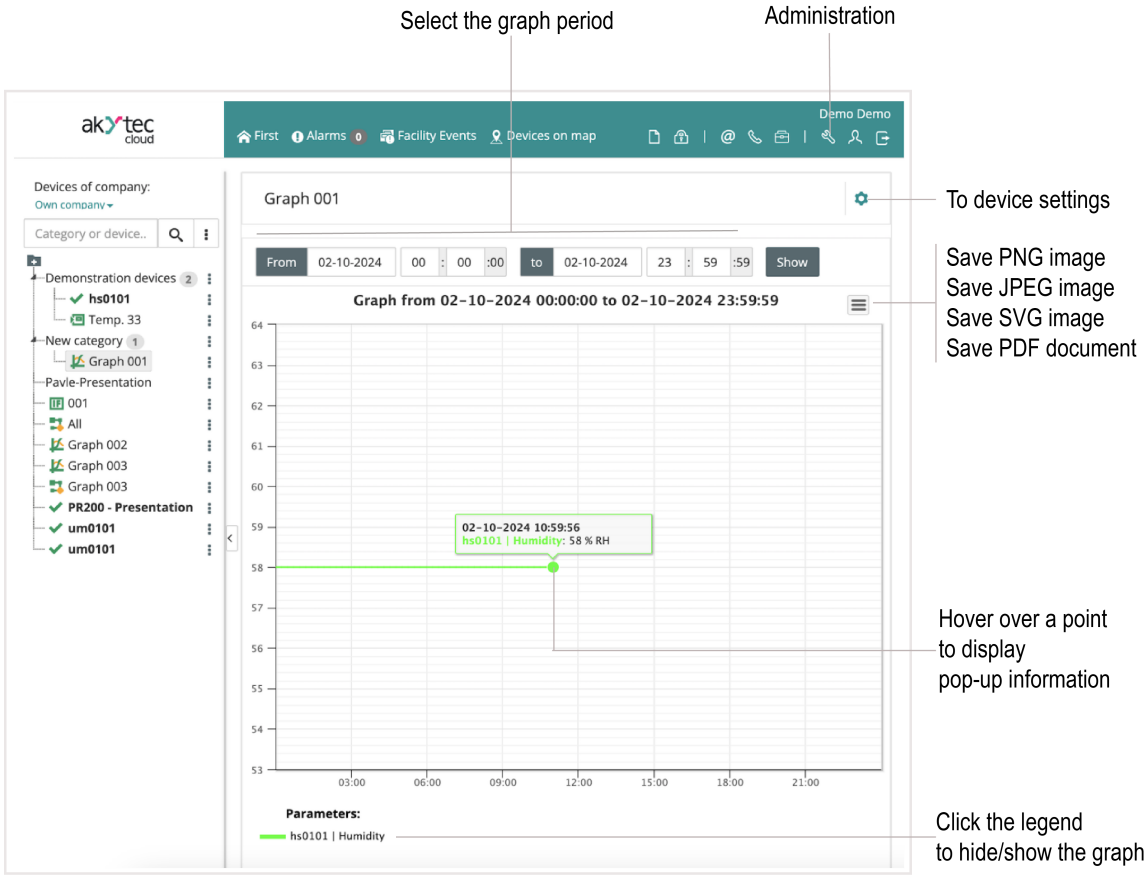


Fig. 9.1 Custom graph

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NOTE
If the custom graph includes data from devices in different time zones, the time in the report is displayed in GMT±0.

– When you select a trend, another window will appear:

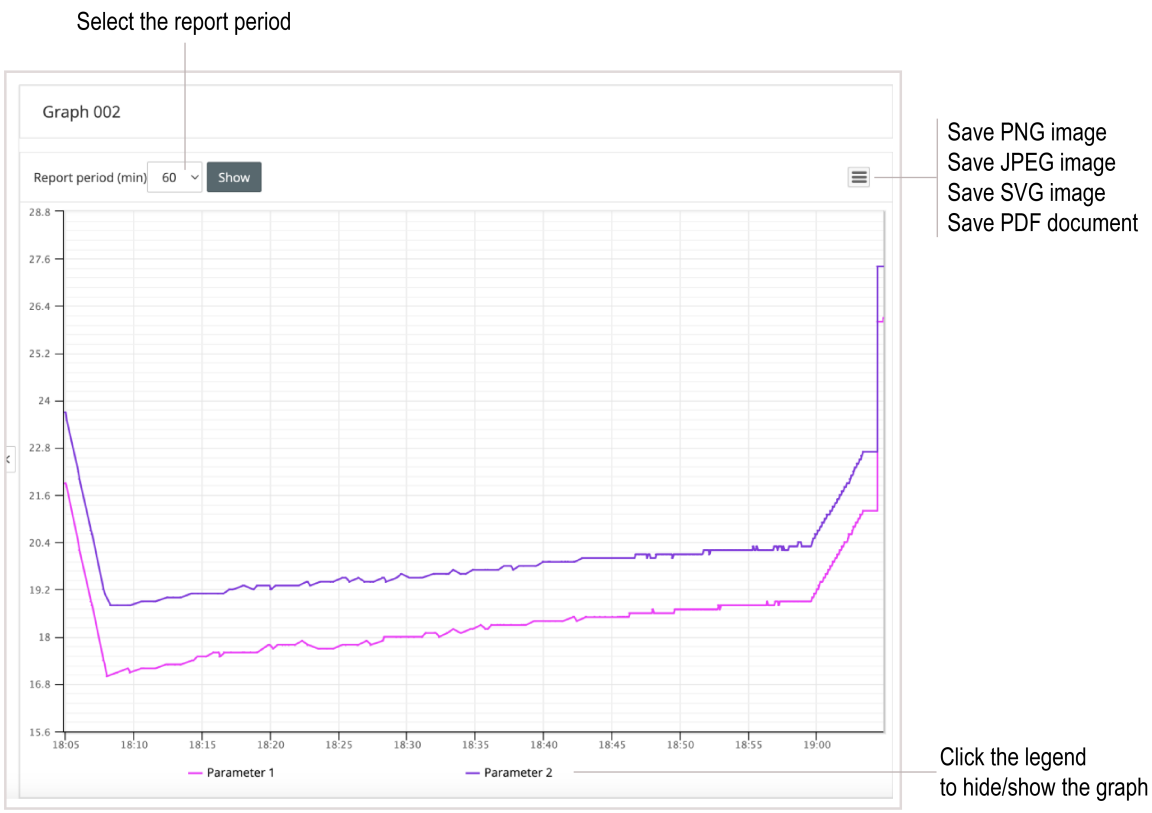


Fig. 9.2 Trend

– When you select an event diagram, a window will appear:

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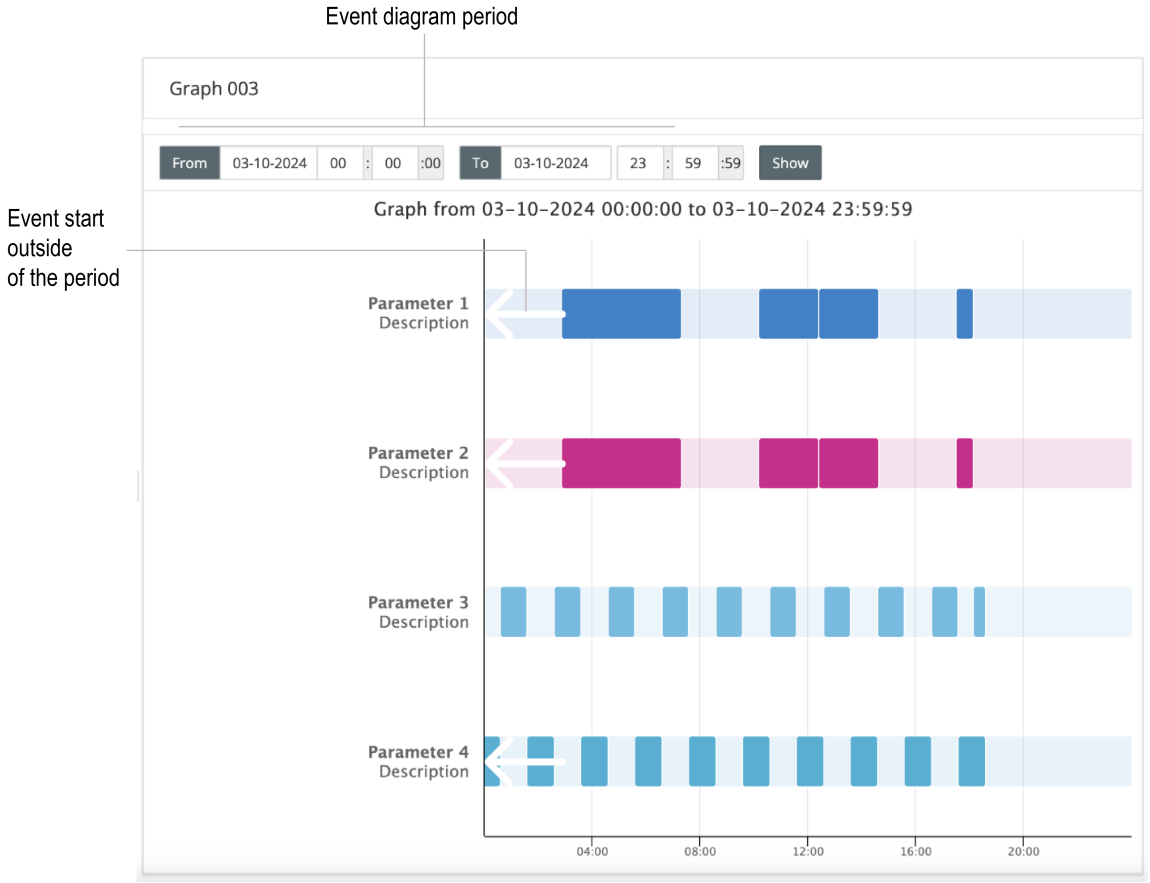


Fig. 9.3 Event diagram

NOTE
The active event will not end if the device is offline.

9.7 Desktop

Desktop is a set of reports with current parameter values, events, templates and trends displayed in one window.
If the reports include data from devices in different time zones, the time in the report is displayed in GMT±0.
The desktop provides monitoring and control of a small facility (a collection of one or more devices) from a single screen where the following can be displayed:

– Current values of parameters, with the option to select the color of values depending on specified conditions
– Events
– Templates for writing from different devices
– *An auto-renewable trend* with a period of up to 60 min.

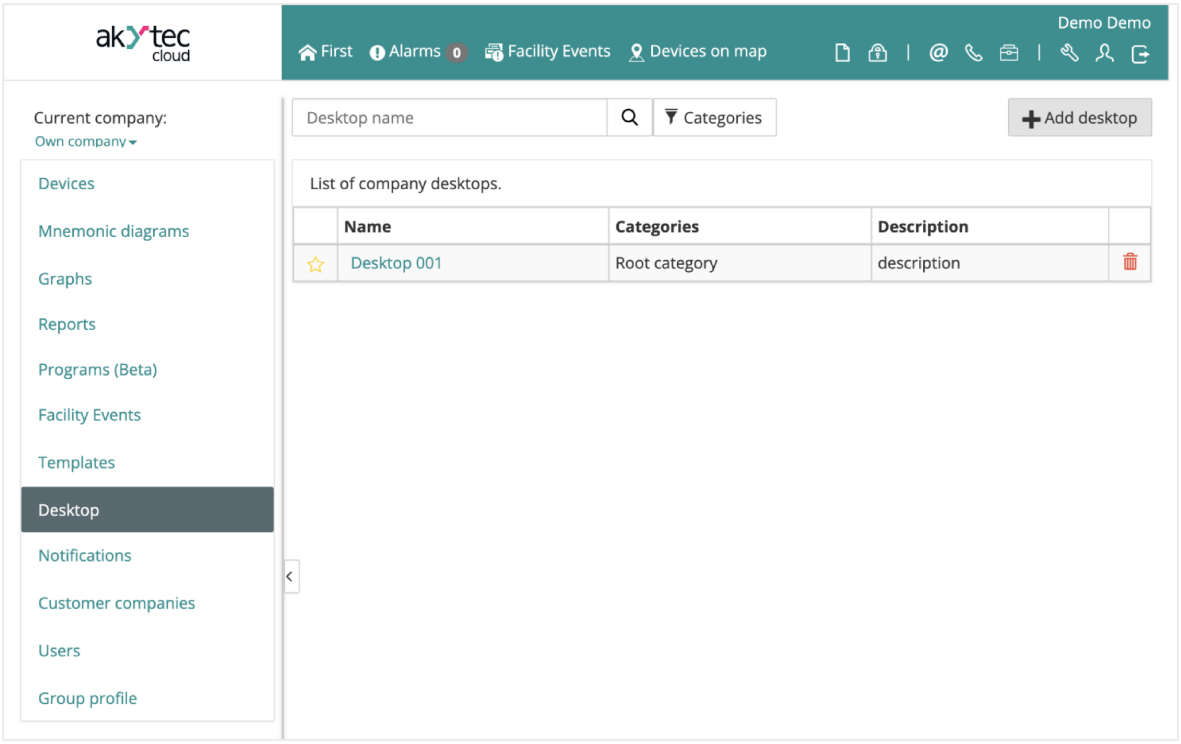
The user can:

– *Create*, edit, delete the desktop, if the user has appropriate *rights*
– *View the desktop*.

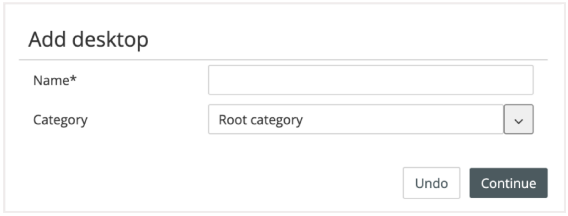
9.7.1 Adding a desktop

Open the **Desktop** tab in the **Administration** section. A new window will appear:

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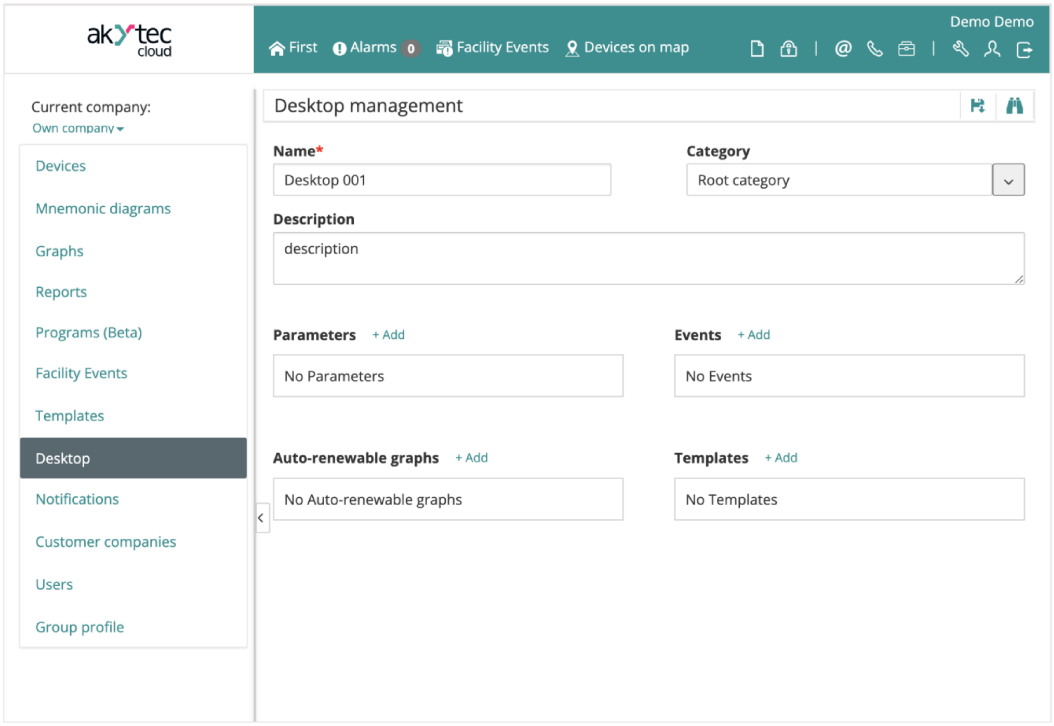


To create a desktop, click the **Add desktop** button. Another window will appear:

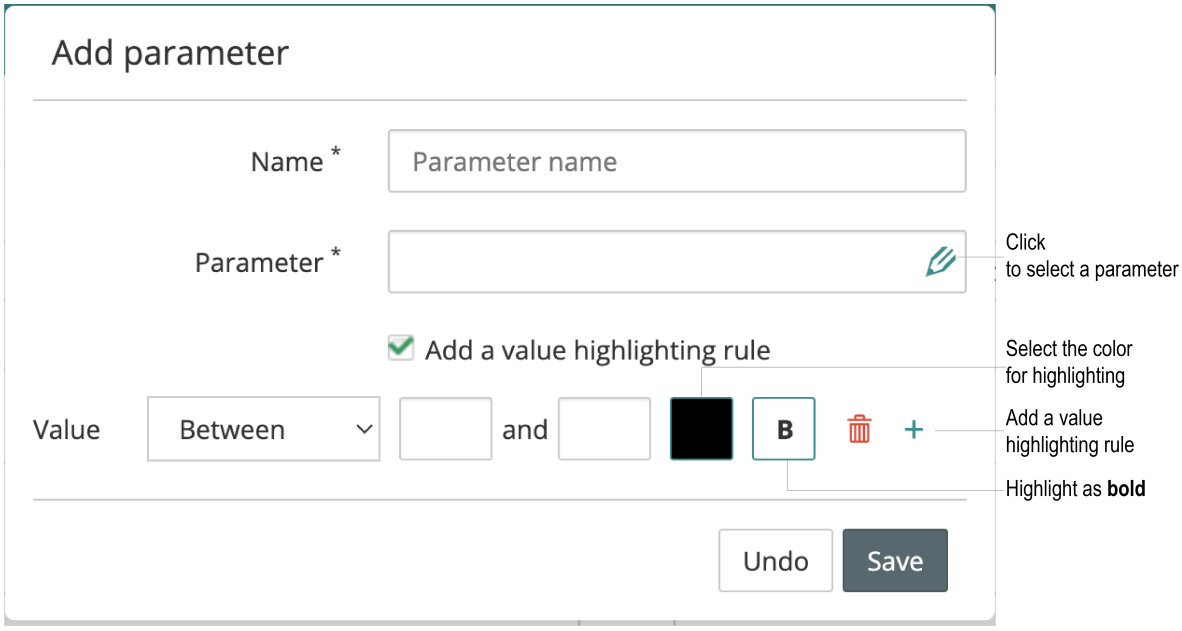


Name – enter a name for the desktop.
Category – select the directory in which the desktop will be placed.
Click the **Continue** button. A window will appear:

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Description – add a description of the desktop, if necessary.
Add the parameters you want to display on the desktop. Click the **Add** button in the **Parameters** section. A window will appear:

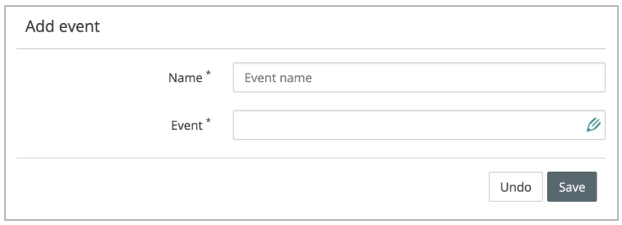


Name – enter the name of the parameter.
Parameter – select a parameter from the list.
Add a value highlighting rule – check the box to enable condition checking and value highlighting.
If you enable **Add a value highlighting rule**, specify the checking rules:

– Choose a condition. Possible values: between, outside, more, less, equals, not equal, greater than or equal to, less than or equal to.
– Set the values for the condition.
– Specify the color you want to highlight the value with when the condition is met.

Click the **Save** button.
Add device events or *facility events* to be displayed on the desktop. The maximum number of events is 15. Click the **Add** button in the **Events** section. A window will appear:

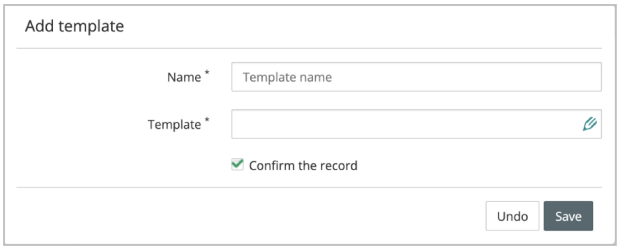
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Name – enter the name of the event.
Event – select device events and facility events:



Add templates you want to display on your desktop. The maximum number of templates is 5. Click the **Add** button in the **Templates** section. A window will appear:



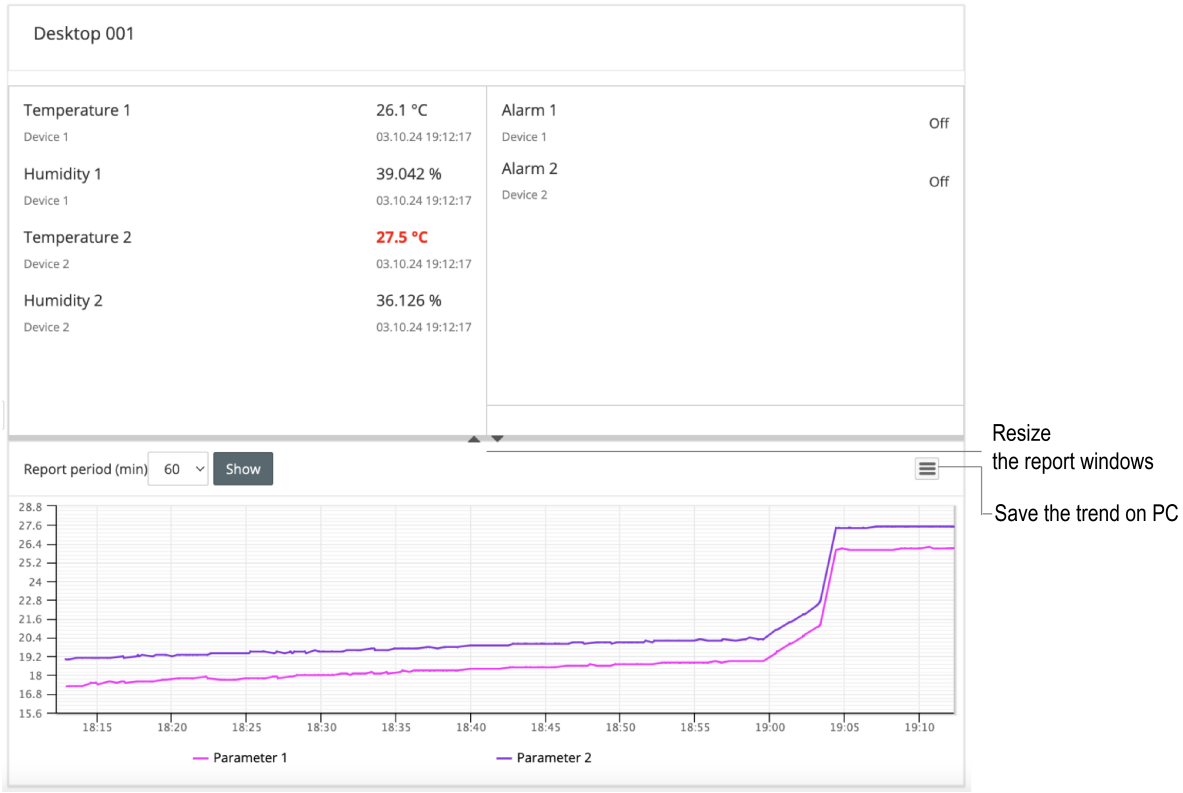
Name – enter a name for the template.
Template – select a pre-made template.
Confirm the record – check this box if you want to confirm the template start.
Add trend - select to add a trend (auto-renewable graphs with a period of up to 60 minutes) to be displayed on the desktop. Before doing this, you need to *create a trend*. The maximum number of trends is 1. Click the **Add** button in the **Trends** section. A window will appear where you can select a trend:



9.7.2 Viewing desktops

Select a desktop in the main akYtec Cloud window. A window will appear:

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9.8 Consolidated report

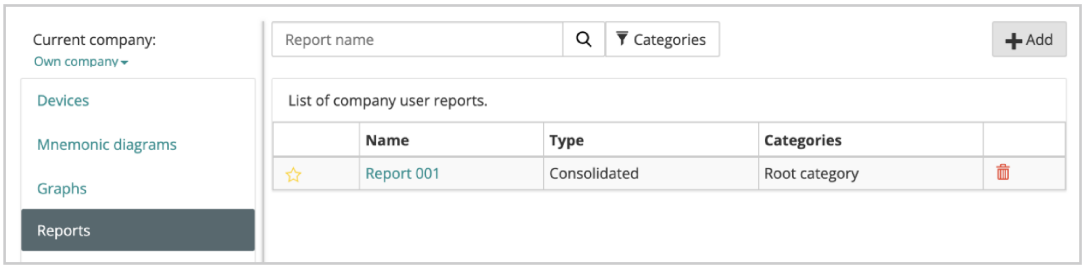
The consolidated report allows you to display the key features of the facility operation (features from different devices) for a certain period of time, taking into account the specified conditions for calculation and conditions for selection of features.
Features can be:

– Operating time under certain conditions
– Average values
– Minimum and maximum values
– Features at the beginning and end of the period, etc.

The number of consolidated reports available to the user is determined by user privileges (see *Section 12*).

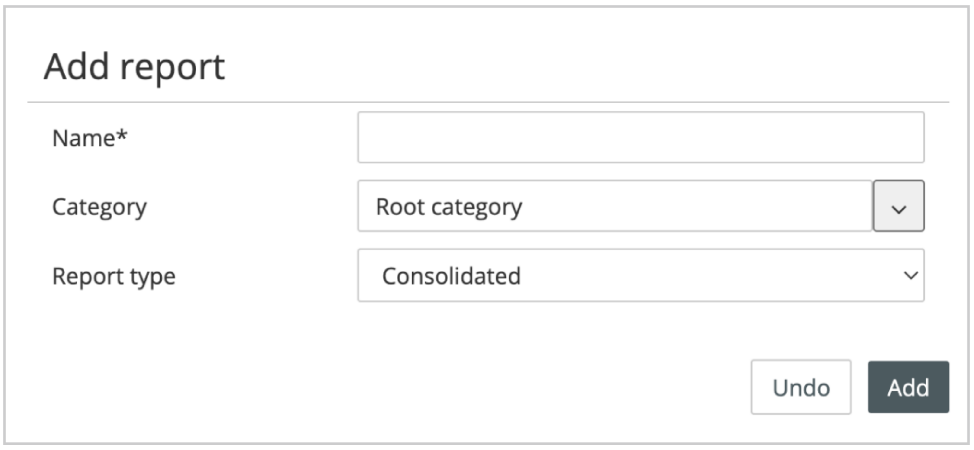
9.8.1 Adding a consolidated report

Click the **Reports** tab in the **Administration** section. A new window will appear:

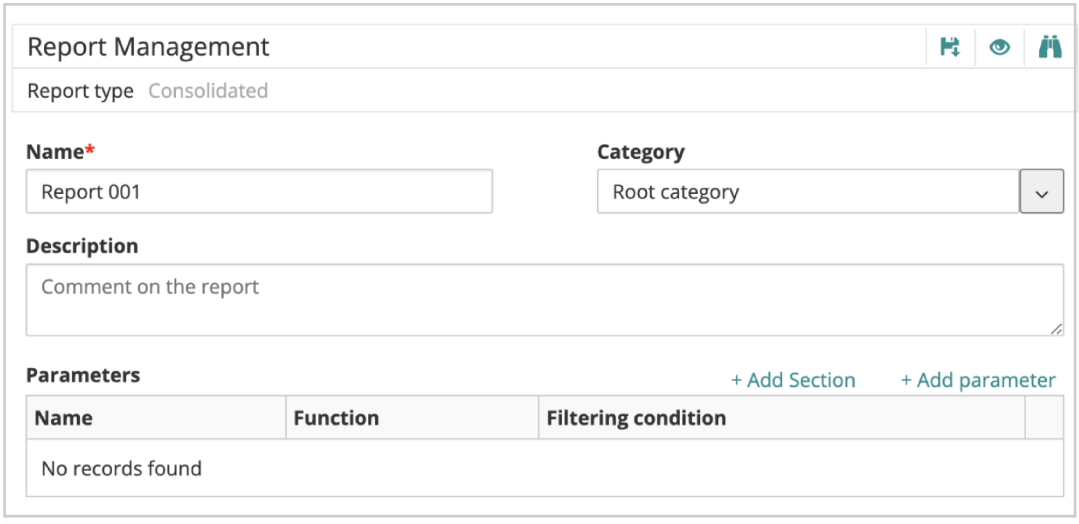


Click the **Add** button. Another window will appear:

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Name – enter a name for the consolidated report
Category – select the groups to which the consolidated report will apply
Report type – choose consolidated.
Click the **Add** button. A window will appear:



To create a report:
– Add report sections
– Add report parameters.

Adding sections

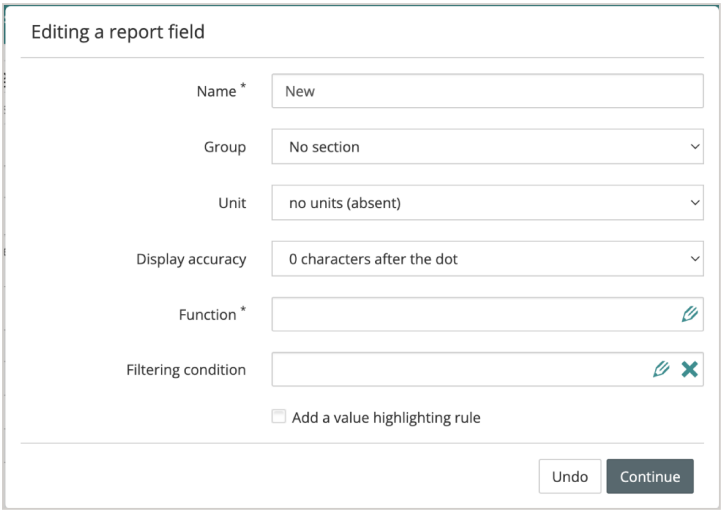
Click **Add section** and add the required number of report sections by naming them.



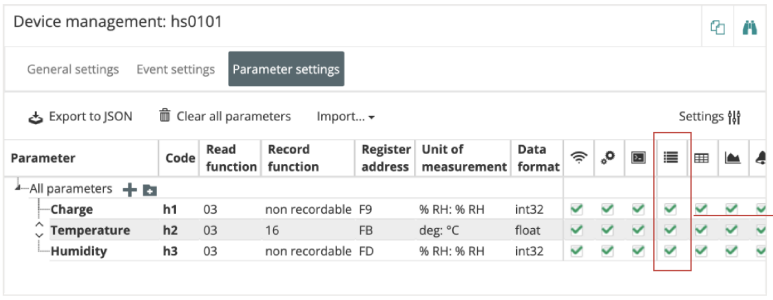
Adding parameters

Click **Add parameter**. The window to create a parameter will appear:

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Name – enter the name of the user parameter.
Group – select the section of the report where the parameter will be located.
Unit – if necessary, select a unit of measure from the list.
Display accuracy – select the number of decimal places (0-5).
Function – select the function that will calculate this parameter.





The list of available device parameters is defined in the device settings (see *Section 8.3.3*).

Table 9.4 Description of functions

CounterTime ()	Total time
Avg()	Arithmetic mean Sum of values divided by their number of values
First()	First value
Last()	Last value
Min()	Minimum value for the period
Max()	Maximum value for the period
Count()	Number of values
Sum()	Displays the sum of all values
SumDistinct()	Displays the sum of all unique (non-repeating) values
CountDistinct()	Displays the number of unique (non-repeating) values

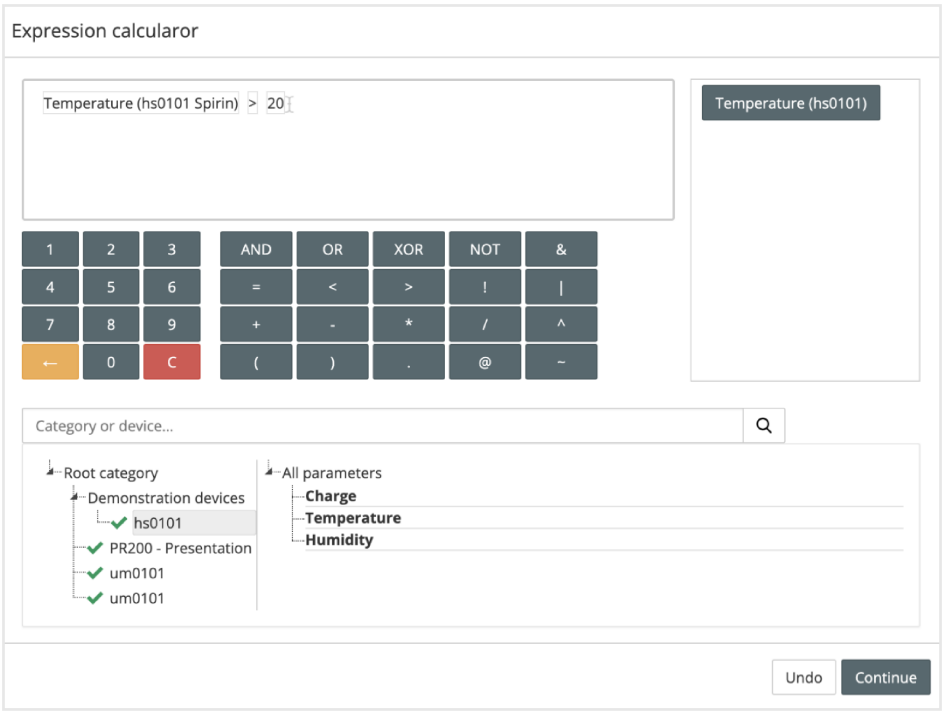
Table 9.5 Restrictions when working with functions

It is not allowed to use parameters without a function:	
<function (“parameter_1”)> +<function (“parameter_2”) >	valid

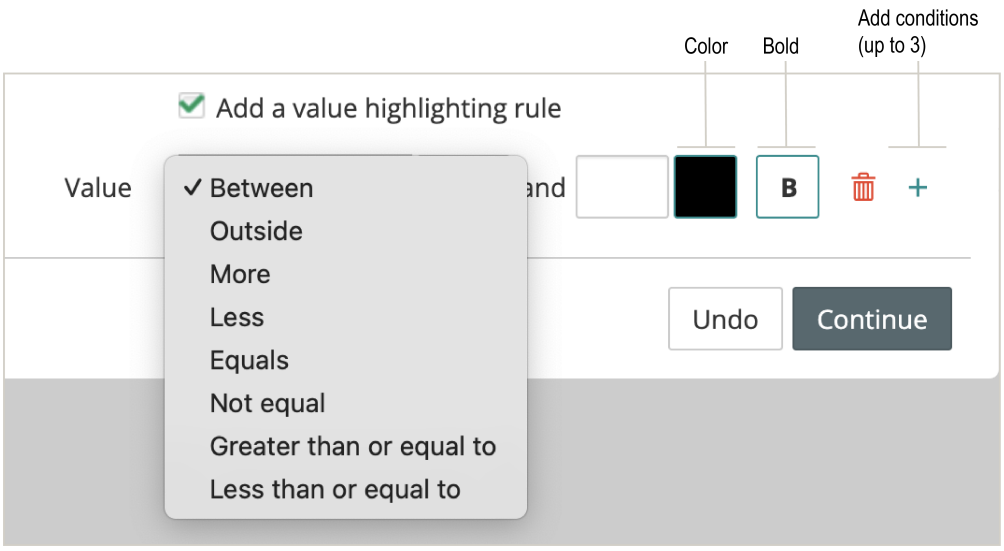
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“parameter_1” + “parameter_2”,	invalid
<function (“parameter_1”)> + (“parameter_2”)	invalid
Only one argument is allowed per function:	
<function (“parameter_1”)> + <function (“parameter_2”)>	valid
<function (“parameter_1”+“parameter_2”) >	invalid
<function (“parameter_1”- 50) >	invalid
It is not allowed to use a function as an argument of another function	
<function (<function (“parameter_1”)>)>	invalid

Filtering conditions – specify the condition under which the function will be calculated (if necessary).



Highlighting rule– specify the rule by which the value of the calculated parameter will be selected (if necessary).

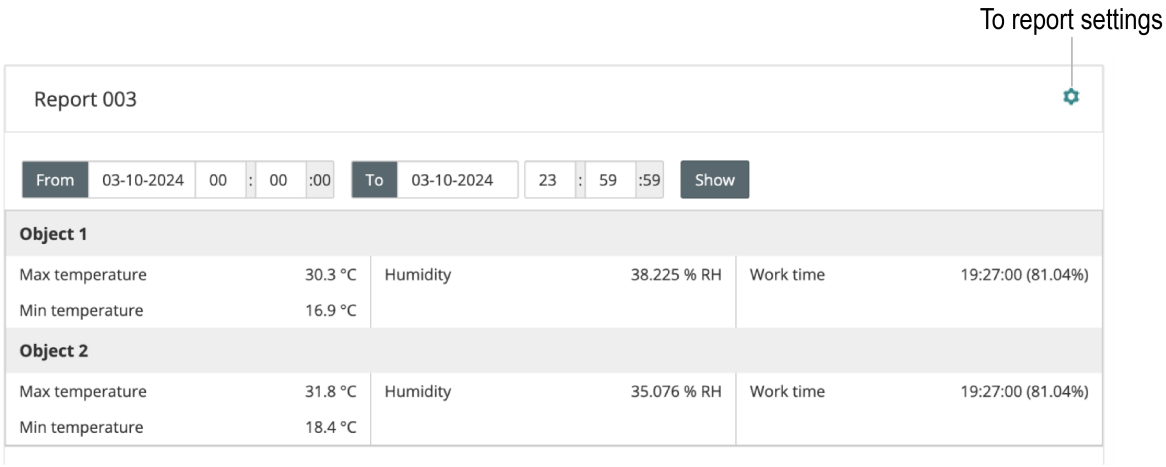


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Click the save report button.

9.8.2 Viewing the consolidated report

In the main akYtec Cloud window, click . A new window will appear:



If the consolidated report includes data from devices in different time zones, the time in the report is displayed in GMT±0.

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10 Events and notifications

The service allows you to configure and control events for individual devices as well as for facilities (groups of devices):

– **Device events**: Triggering conditions are set in the device event settings and are displayed in the **Events** report generated by the selected device (see *Section 10.1*).
– **Facility events**: Events are set by facility, based on parameters for a single device or a group of devices. These settings are found in **Administration / Facility events**. All generated events are displayed in the **Facility events** account report (see *Section 10.2*).

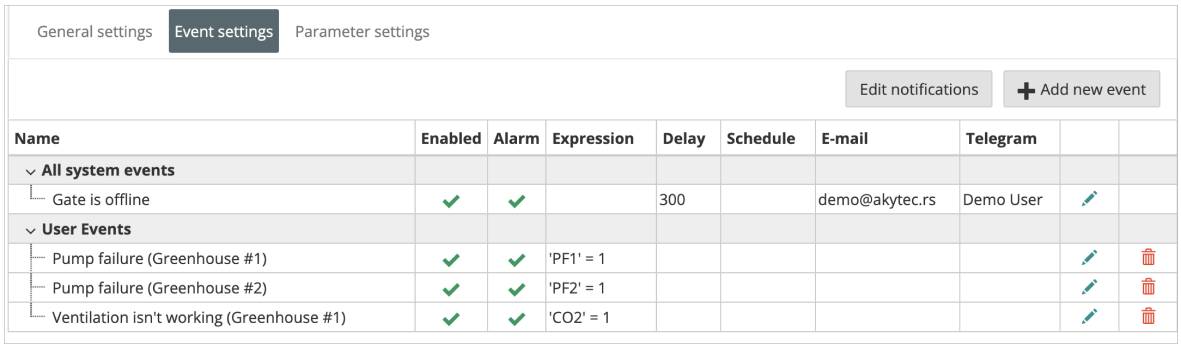
The following options are available for both device and facility events:

– Set the type of event: **simple** (informational) or **alarm**.
– Set the **schedule** for checking the event triggering condition.
– Track information: see who read the event and when it was read.
– Set up recipients and services for sending notifications.

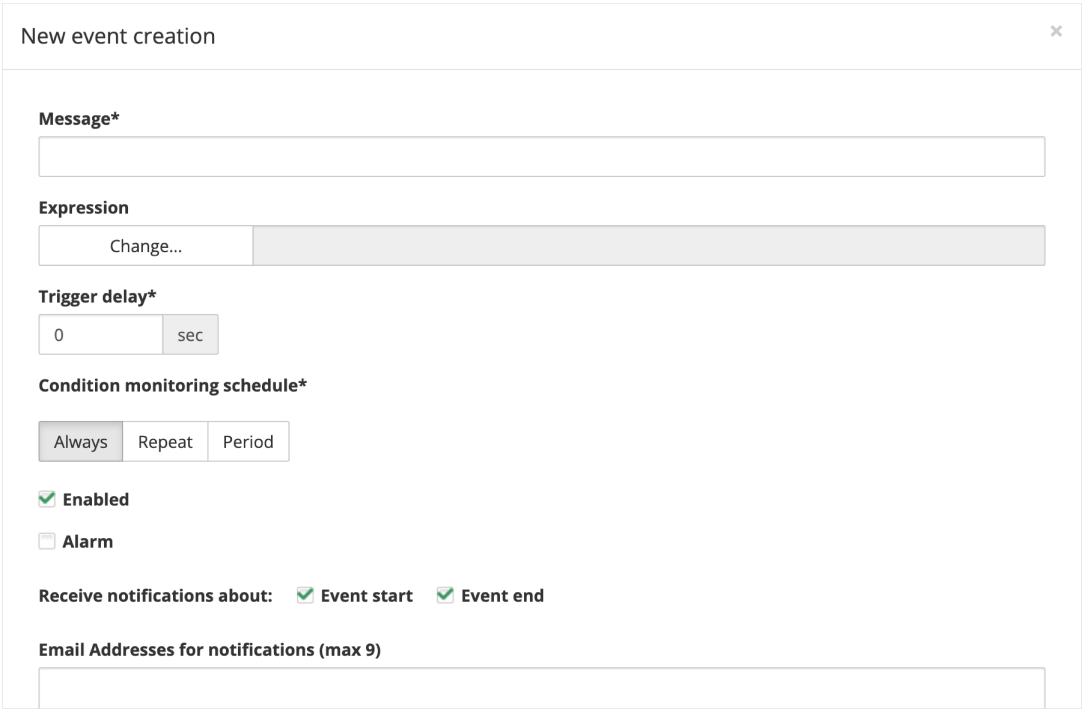
10.1 Device events

10.1.1 Setting the device events

Open the **Devices** tab in the **Administration** section. Select a device by clicking on its name. A window with the device settings will open.
Open the **Event settings** tab. A new window will appear:

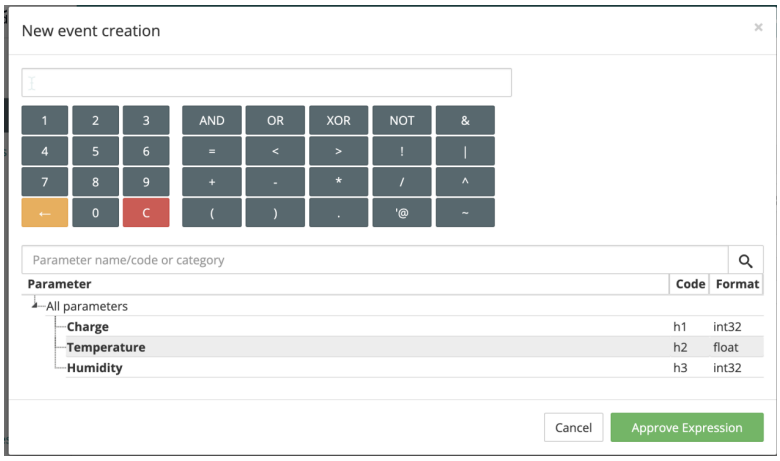


Click the **Add new event** button. Another window will appear:



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Message – the name of the event.
Expression – enter a logical expression that defines the condition for the event to occur. A list of supported operators and example expressions is provided in *Table 10.1*. The available parameters for generating event conditions are defined in the device settings (see *Customizing the display of parameters in reports*).
Click the **Edit** button to generate the expression for the event. A window will appear:



Enter a logical expression based on the following conditions:
– The "."(period) character is used as the floating point separator.
– Operators are processed from left to right.
– Operators enclosed in brackets are processed first.
– Bits are numbered starting from zero.

Table 10.1 Event Operators

No.	Operator	Description
Arithmetic operators		
1	+	Addition
2	-	Subtraction
3	*	Multiplication
4	/	Division
Logical operators		
5	AND	Logical AND
6	OR	Logical OR
7	XOR	Exclusive OR
8	NOT	Negation
Bit operators		
9	&	Bitwise AND
10	|	Bitwise OR
11	^	Bitwise exclusive OR
12	~	Bitwise inversion
Comparison operators		
13	=	Equality check
14	!=	Inequality check

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No.	Operator	Description
15	<	Less than
16	>	More than
17	<=	Less than or equal to
18	>=	Greater than or equal to
Additional operators		
15	(…)	Priority setting operator
16	@	Parameter error code retrieval operator (see example 3 below)

Examples of expressions:

– wInput1 < 10

The alarm will be enabled as long as the value of the wInput1 parameter is less than 10.

– (xInput1=1) AND (xInput2=1)

The alarm will be enabled as long as both xInput1 and xInput2 are TRUE (1).

– @wInput1=255

The alarm will be enabled as long as the polling error code of the wInput1 parameter is 255 (no response from the device).

– (wInput1 & 4) = 4

The alarm will remain enabled as long as the second bit of the wInput1 variable is set to TRUE (1).

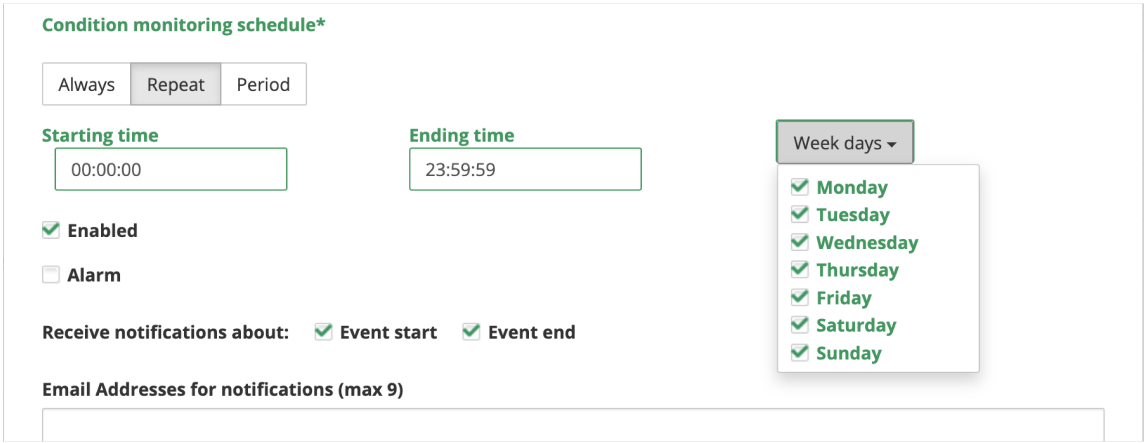
Click the **Approve Expression** button.

Trigger delay – enter the duration for which the event condition must be met before the event is triggered.

Condition monitoring schedule – select the schedule for checking the event triggering condition. Possible options:

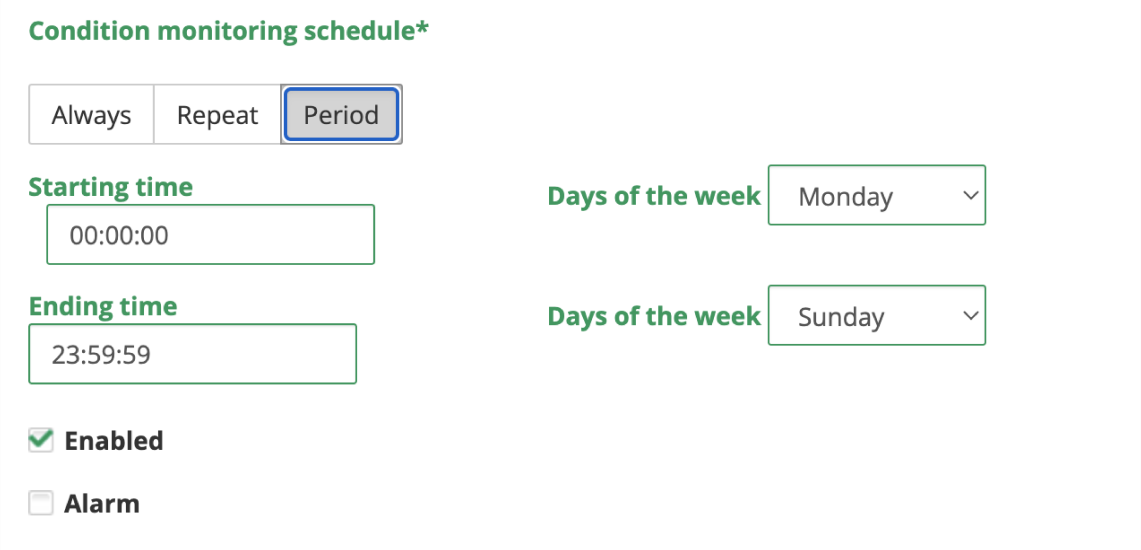
– **Always:** The event condition is checked 24/7, every day.

– **Repeat:** The event condition is checked on specific days of the week and only during the designated time interval. Specify the "Starting time" and "Ending time" times, and select the days of the week on which the event condition should be checked.



– **Period:** The event condition is checked within the specified time period. Specify the "Starting time" and the day of the week, as well as the "Ending time" and day of the week, during which the event condition should be checked.

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NOTE
Events are displayed based on the following conditions:

– If the event's start and end times are fixed outside the schedule, the event will not be displayed. For example, if a repeat is set from 08:00 to 18:00, but the event occurs from 21:00 to 22:00, the event will not be displayed.
– If the event start time is fixed outside the schedule but the event continues during the schedule's validity period, the event will be displayed starting at the beginning of the schedule's validity period. For example, if a repeat is set from 08:00 to 18:00, and the event occurs at 07:00, the event's start will be displayed at 08:00.

Enabled – check the box if you want the event to be marked as enabled.
Alarm – check the box if you want this event to be classified as an alarm. Viewing alarms in akYtec Cloud:

– Account alarms (see *Viewing alarms in devices and facilities of account*)
– Device alarms (see *Viewing user facility events*).

Receive notifications about — check the boxes if you want to receive notifications when an event starts and/or ends.

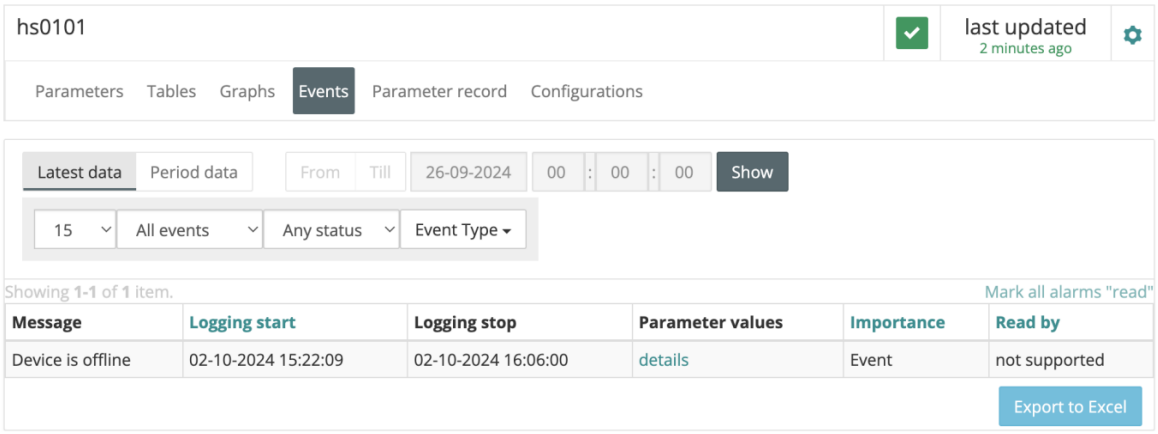
NOTE
The setting only affects receiving notifications via telegram_bot and email; it does not affect the display of events in reports.

E-mail notification list – a list of email addresses (separated by commas and semicolons) to receive notifications. The maximum number of recipients allowed is 9.
List of Telegram notification recipients – add recipients by clicking the **Add** link. Ensure there is a token for the Telegram bot (see *Telegram bot setup*).
The maximum number of events for the device is 50.

10.1.2 Viewing the device event list

Select the device and open the **Events** tab in the main akYtec Cloud window. A window will appear:

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The report uses the following color indication:
– **Pink:** An unread and incomplete alarm
– **Yellow:** A read and incomplete alarm
– **Green:** A read and complete alarm
– **White:** An unread and complete alarm
– **Grey:** A complete event
– **Blue:** An incomplete event.

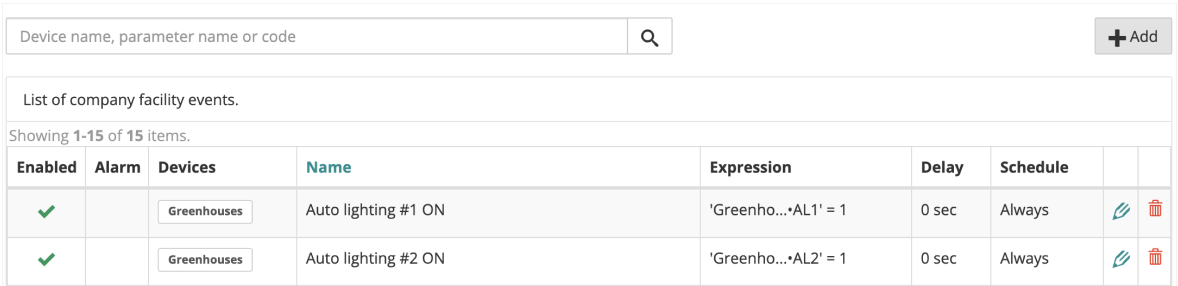
The report contains the following information about each event:
– **Message:** The text of the notification
– **Logging start:** The time the event started
– **Logging stop:** The time the event ended
– **Parameter value:** Conditions of event logging
– **Criticality:** The criticality of the event. Possible values: simple event or alarm
– **Read by:** The name of the user who read the event notification.

If necessary, mark all events as read by clicking the **Mark all alarms as read** link.
Use filters if necessary:
– **Criticality:** Alarms or simple events
– **Event status:** Pending or past
– **Event type:** All system events and user events.

10.2 Facility events

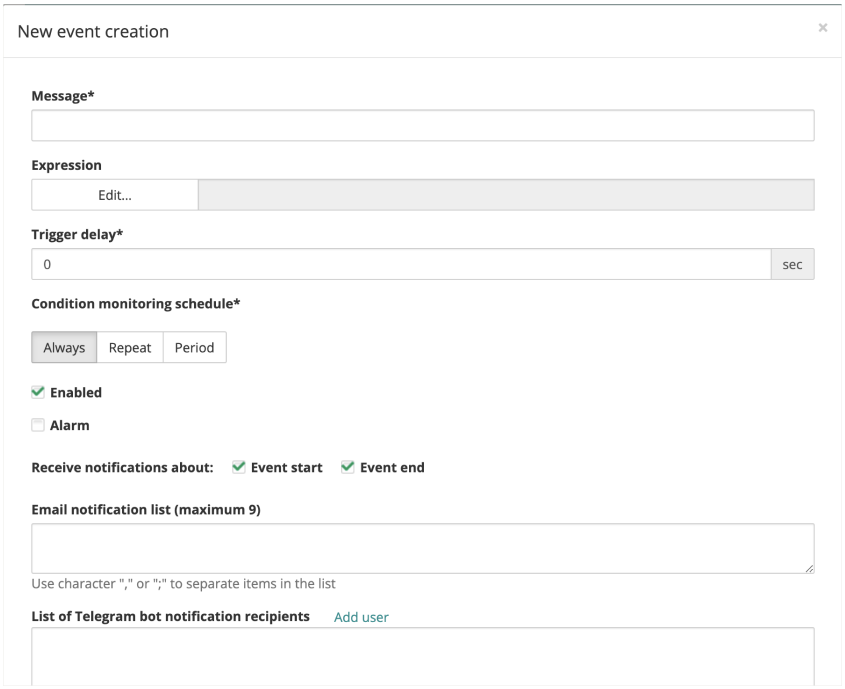
10.2.1 Setting the facility events (in device group)

Open the **Facility events** tab in the **Administration** section. A new window will appear:



To add an event, click the **Add** button. Another window will appear:

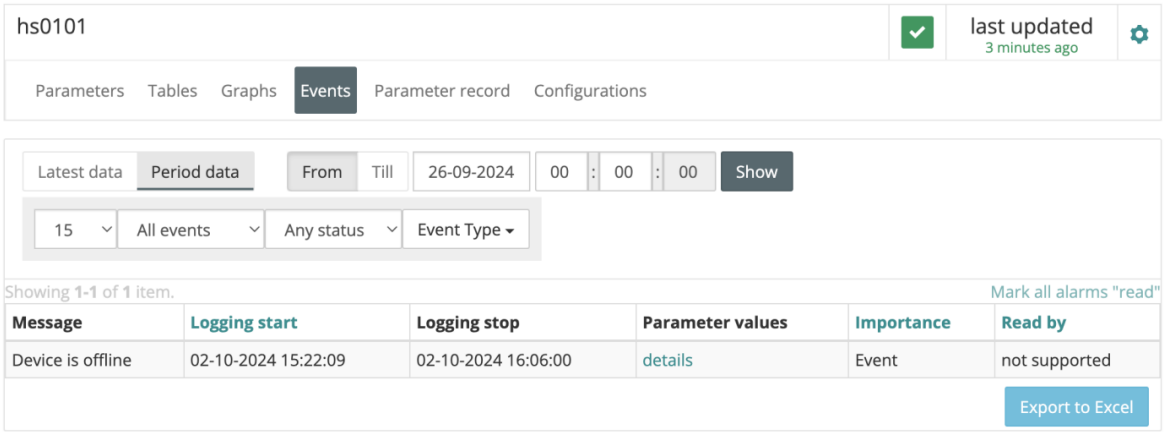
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Fill in the fields to add an event similar to a device event (see *Section 10.1.1*). In the **Expression** field, specify the conditions under which the event occurs for multiple devices (facility).

10.2.2 Viewing custom facility events

Click the **Facility events** link in the main akYtec Cloud window. A window will appear:



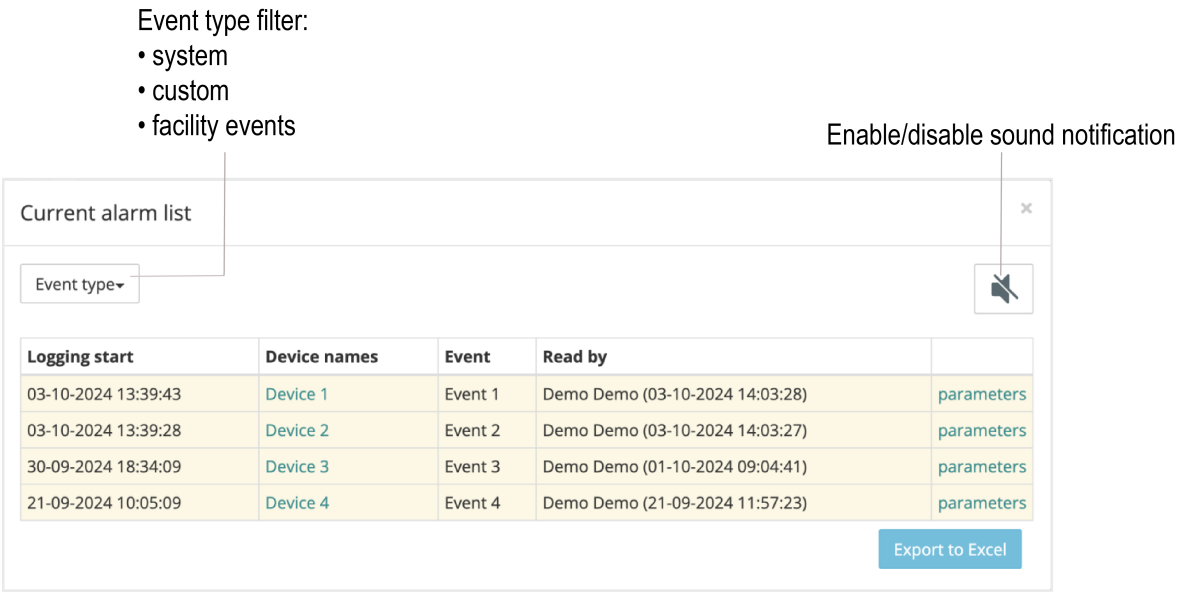
Use filters if necessary:

– **Criticality:** Alarms or simple events
– **Event status:** Pending or past
– **Event type**

10.3 Viewing the current alarms in devices and facilities of the account

The **Alarms** section allows you to view all current alarm events from account devices and facilities in one window.
Click the **Alarms** link in the main akYtec Cloud window. A window will appear:

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The report uses the following color indication:
– **Pink:** An unread and incomplete alarm
– **Yellow:** A read and incomplete alarm
– **Green:** A read and complete alarm
– **White:** An unread and complete alarm.

10.4 Notifications

10.4.1 General information

akYtec Cloud provides the following types of notifications:

1. **Email**
2. **Telegram bot**

Notification recipients are configured when creating a device event, facility events and in the **Administration / Notifications** section for each notification channel (e-mail or Telegram bot).
An integrator can receive Telegram bot notifications for device events and facility events from the integrator's customers' companies (see *Notification setup*).

10.4.2 Notification setup

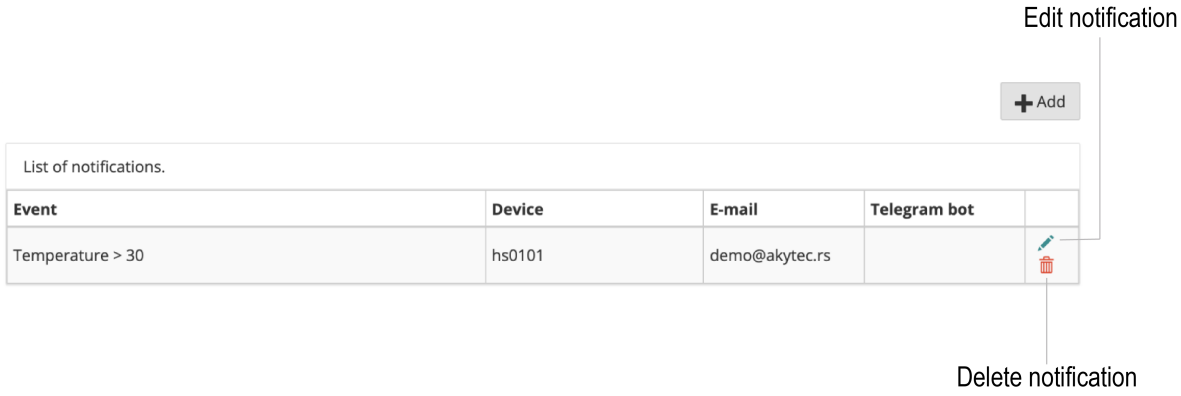
This section describes all the rules for notifications configured for device events or facility events.
Notifications are configured:
– When setting up the device events
– When setting up the facility events
– In the Administration / Notifications section

Notification setup in the **Administration** section is available to users with the following privileges:
– Event Manager

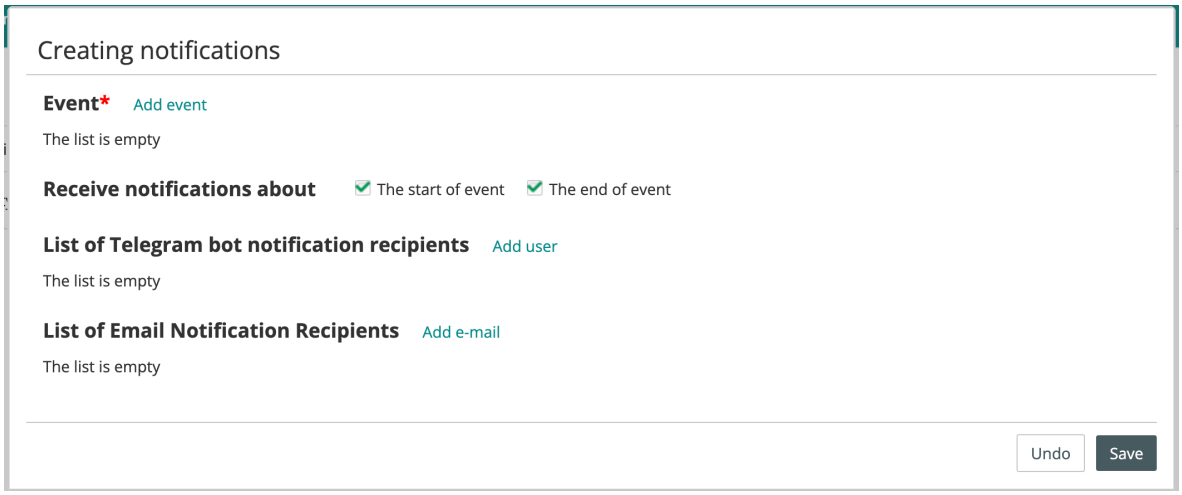
For accounts with system integrator status, event notifications can be configured in the integrator's customer account by:
– Customer Manager
– Customer Viewer

To set up notifications, go to the **Administration** section and open the **Notifications** tab. A window will appear:

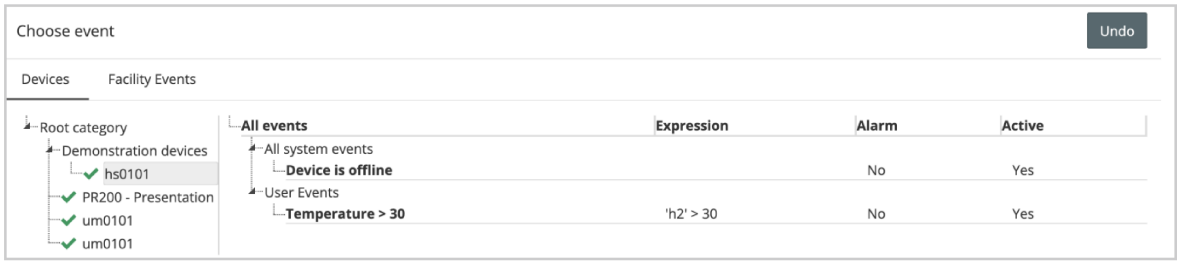
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The notification list displays event notifications for the devices available to the user, provided the corresponding privilege is granted (see *Section 15.2*).
Create a rule to send notifications by clicking the **Add** button. A window will appear:



Add a device or facility event to send a notification by clicking the **Add event** link. A window will appear:



Select a device or facility events.

NOTE
It is not allowed to create multiple notification rules with the same events for a device or facility.

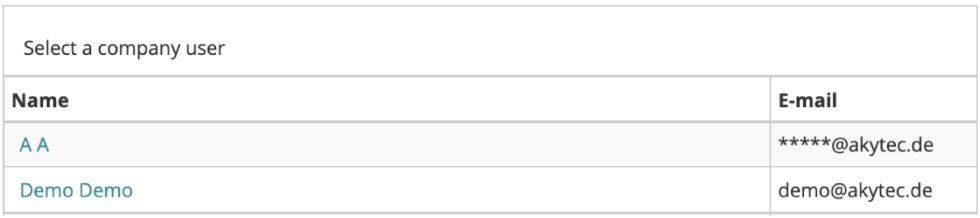
Receive notifications about — check the boxes if you want to receive notifications when an event starts and/or ends.

NOTE
This setting only affects receiving notifications via Telegram bot and email; it does not affect the display of events in reports.

Specify the services and notification recipients:

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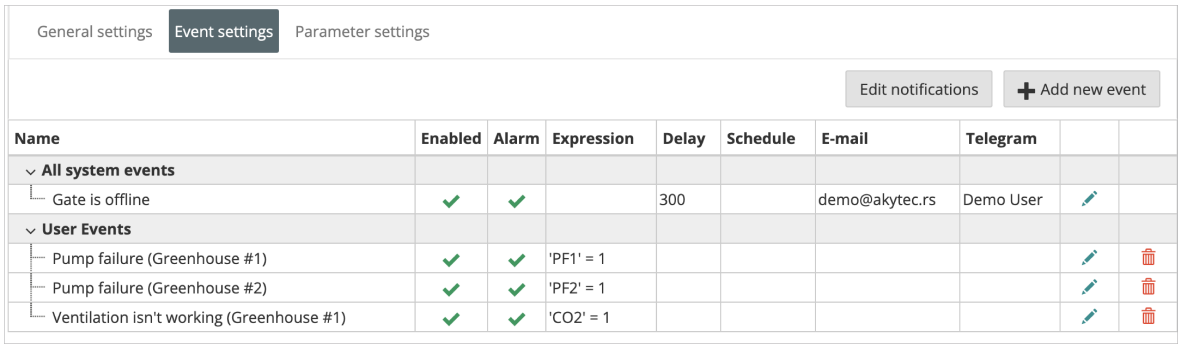
– Recipients via Telegram bot. Verify token settings for selected users (see *Section 10.4.4*). When configuring notifications by the integrator in the customer company, users are selected as recipients of notifications from both the customer company and the integrator company.



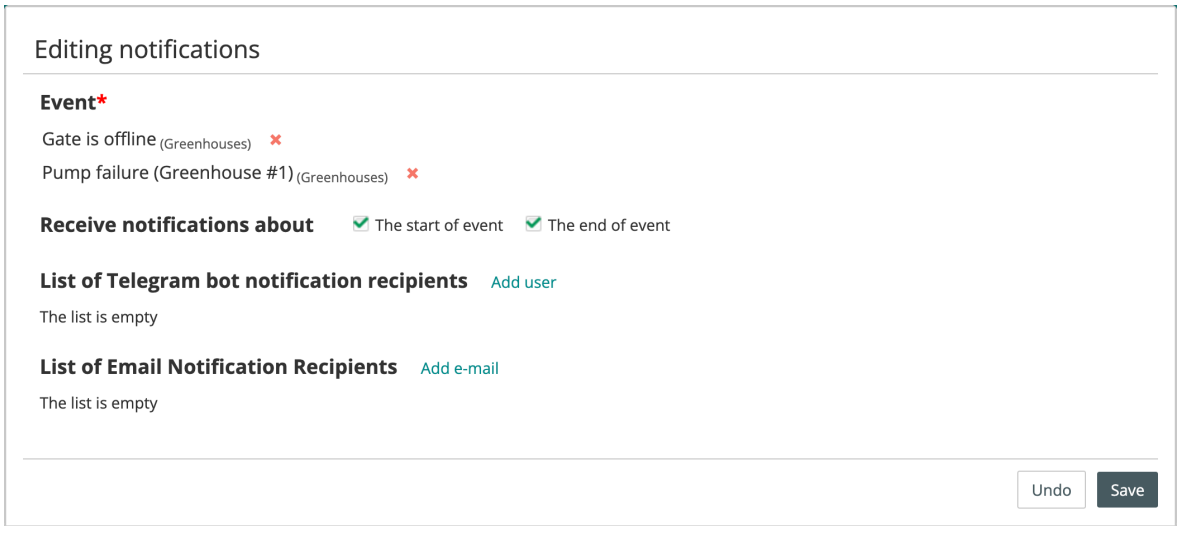
– Add notification recipients by email by clicking the **Add email** link. A window will appear where you can enter the email addresses of users to receive notifications. The maximum number of emails is 9.

10.4.3 Device notification setup

Open the **Devices** tab in the **Administration** section. Select a device by clicking its name. The device settings window will appear.
Open the **Event settings** tab. A window will appear:



Click the **Edit notifications** button. A window will appear:



Select the device events by deleting the others, and specify the notification recipient lists for each communication channel by clicking the corresponding links.

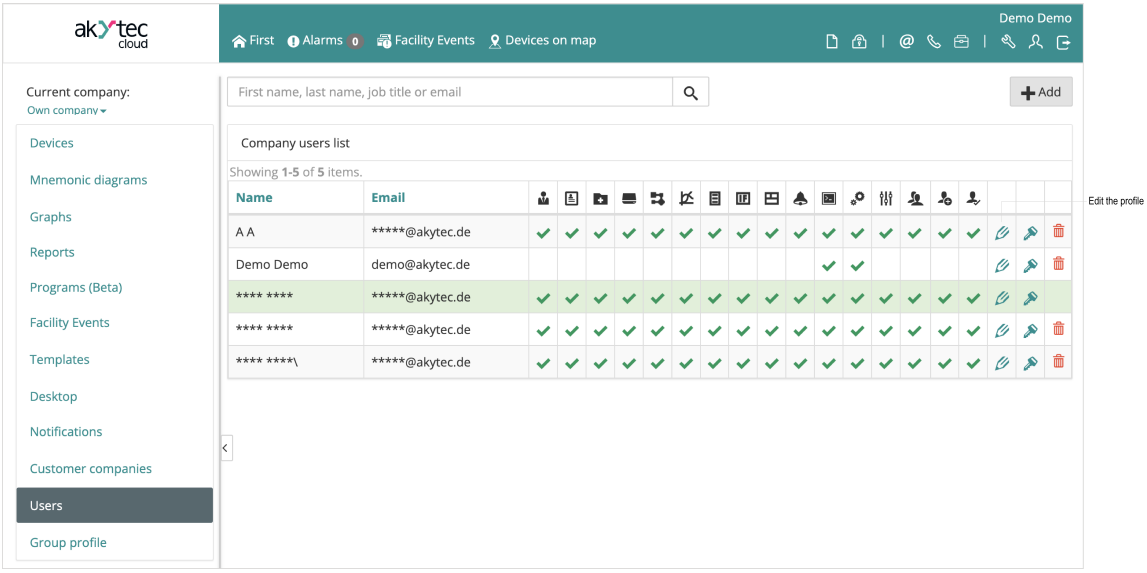
10.4.4 Telegram bot setup

To receive notifications via the Telegram messenger, go to the device event settings or in the facility event settings (device group) and select users who will receive notifications through the akYtec Cloud Bot.

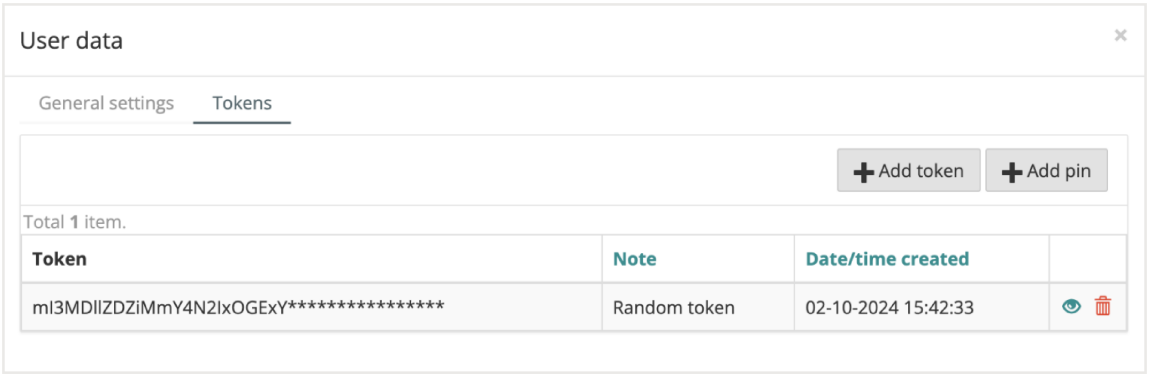
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To work with akYtec Cloud Bot:

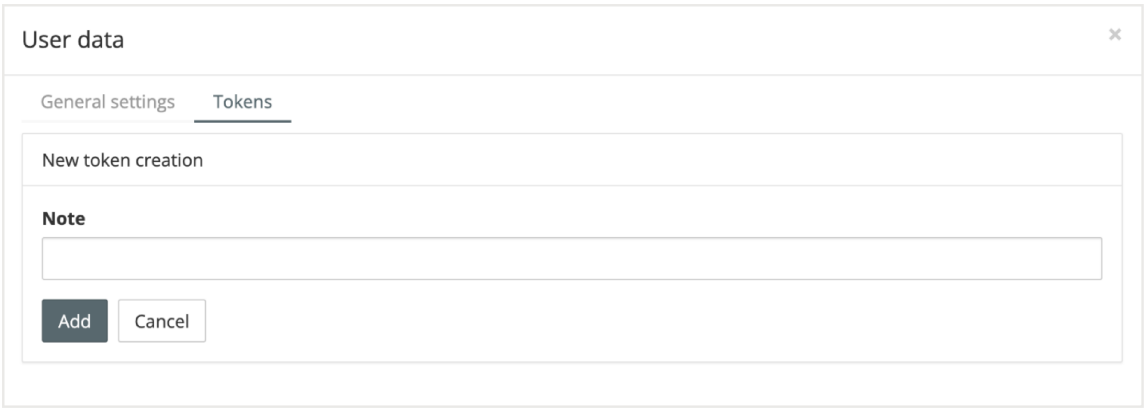
– In the Telegram messenger, add a bot by going to https://t.me/akYtec_Cloud_Bot
– In akYtec Cloud, go to **Administration / Users** and click the **Edit** button.



– Click the **Tokens** tab in the opened window:

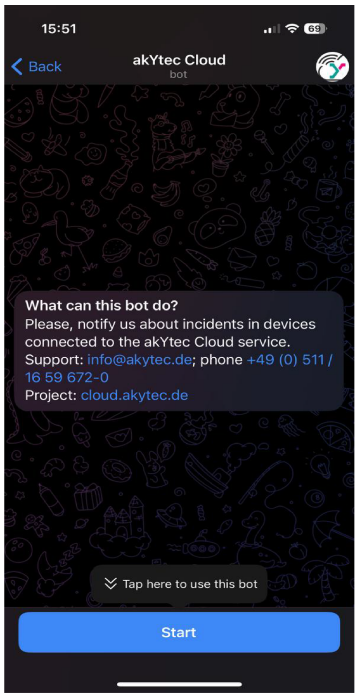


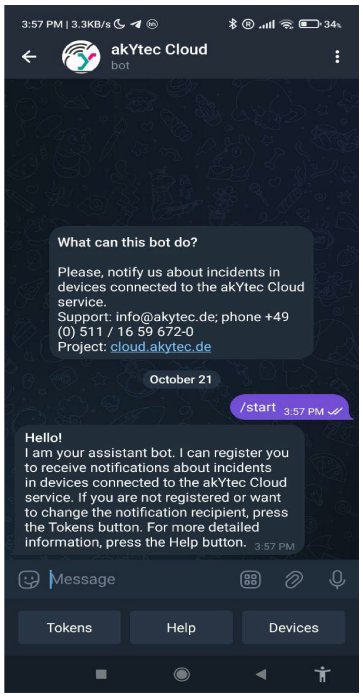
– Click the **Add token** button. A window will appear:

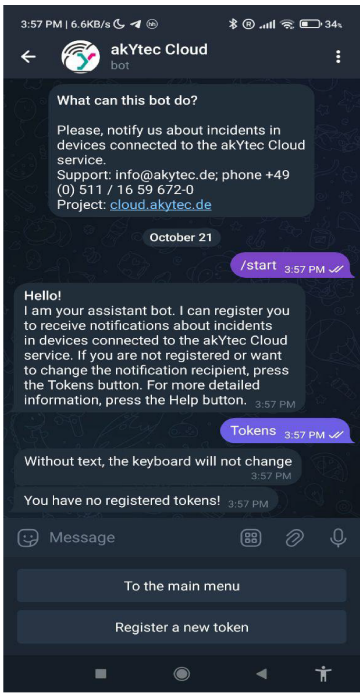


– Click **Start** in the Telegram messenger:

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– Click the **Tokens** button. Then, click the **Register a new token** button.
– Enter the token or upload an image of the QR code.

When simple or alarm events are registered in akYtec Cloud, the event information will be displayed in Telegram.

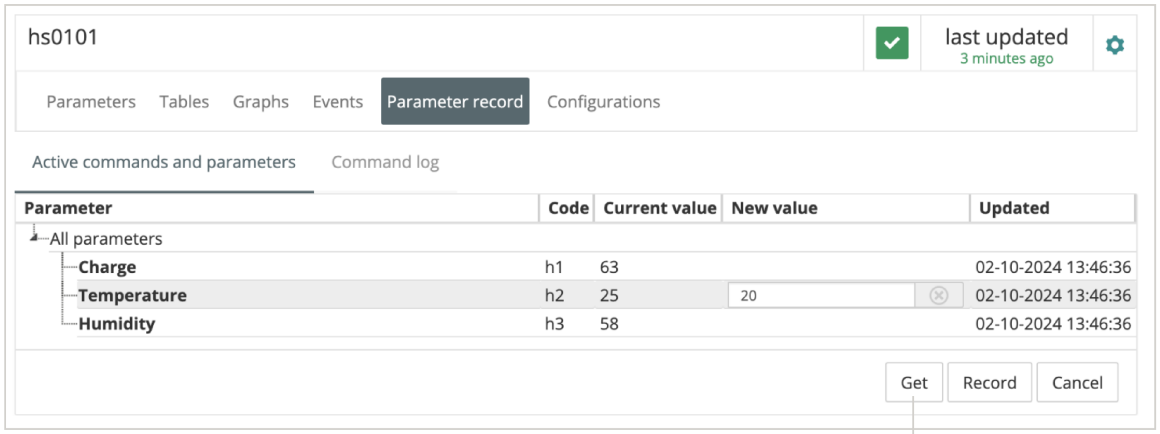
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11 Remote control

There are three types of setting records when controlling the device and facility:
Recording parameter values into the device is used in the following cases:
– To verify that the parameters are correctly recorded into the device at the time of installation.
– To change a parameter value in a single device, if the user has sufficient qualification.
Recording parameter template into the devices is used in the following cases:
– For simultaneous execution of the same type of device actions.
– For recording set points into multichannel devices.
– For simultaneous recording into multiple devices.

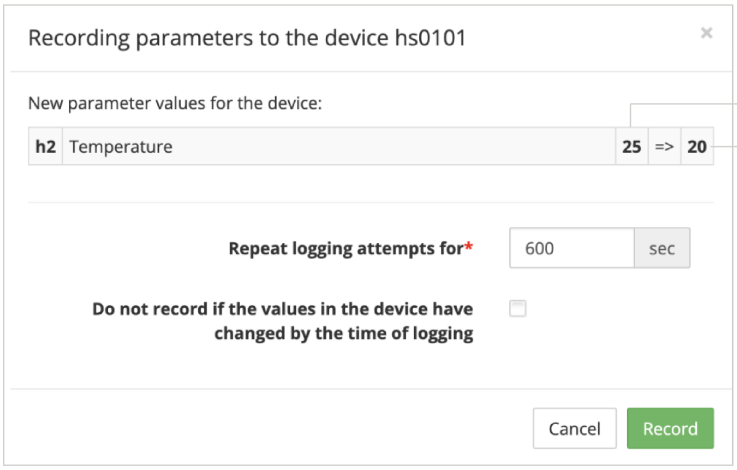
11.1 Recording the values of the controlled parameters into the device

In the main akYtec Cloud window, select the device and open the **Parameter record / Active commands and parameters** tab. A window will appear:



Get the values of manageable parameters out of the queue

In the **New value** column, enter the values for only the parameters you want to change. Click the **Record** button. A window will appear:

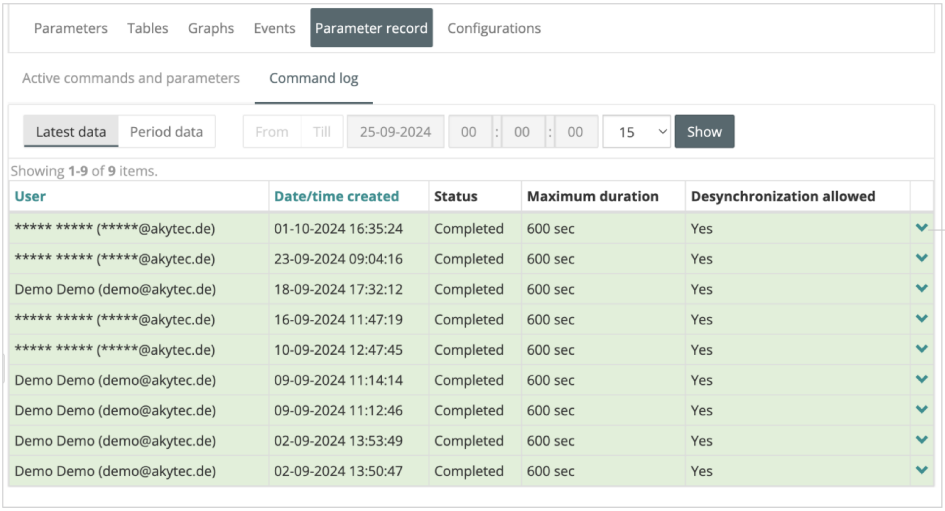


«Old» value

Recorded value

Repeat logging attempts for – specify the time interval for retrying recording attempts if the first attempt is unsuccessful.
Do not record if values in the device have changed by the time of logging – check the box to prevent recording new parameter value if the old value has changed.
Click the **Record** button.
To view the command log, open the **Parameter record / Command log** tab. A window will appear:

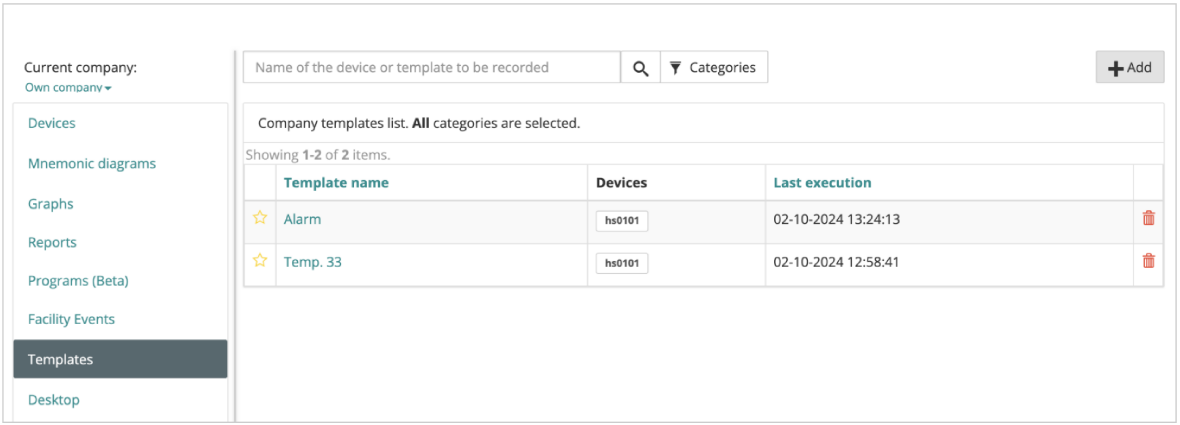
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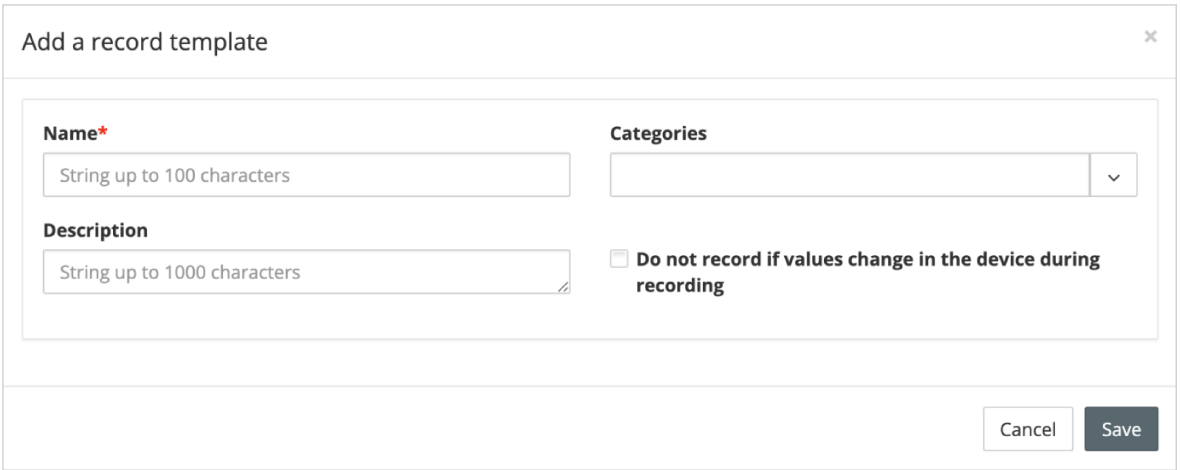
Specify the time interval of data to be displayed in the report by selecting **Latest data** or **Period data**, and set the appropriate values in the **From** and **Till** fields. Click the **Show** button.

11.2 Creating and recording parameters from a template into the devices

Open the **Templates** tab in the **Administration** section. A window will appear:



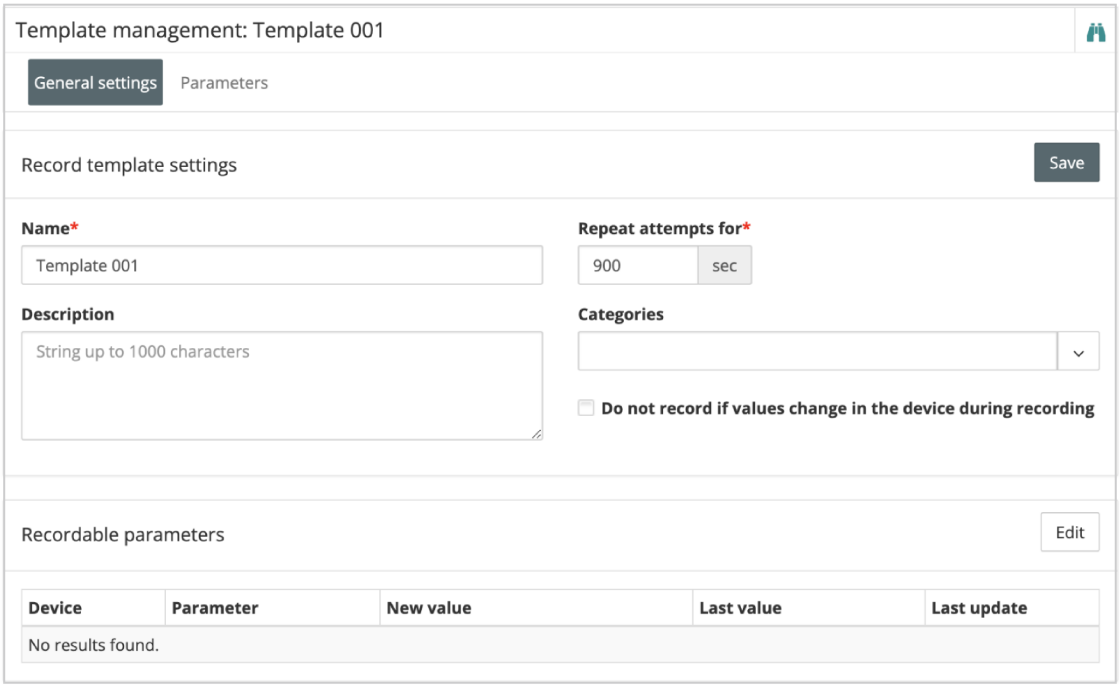
Click the **Add** button. A window will appear:



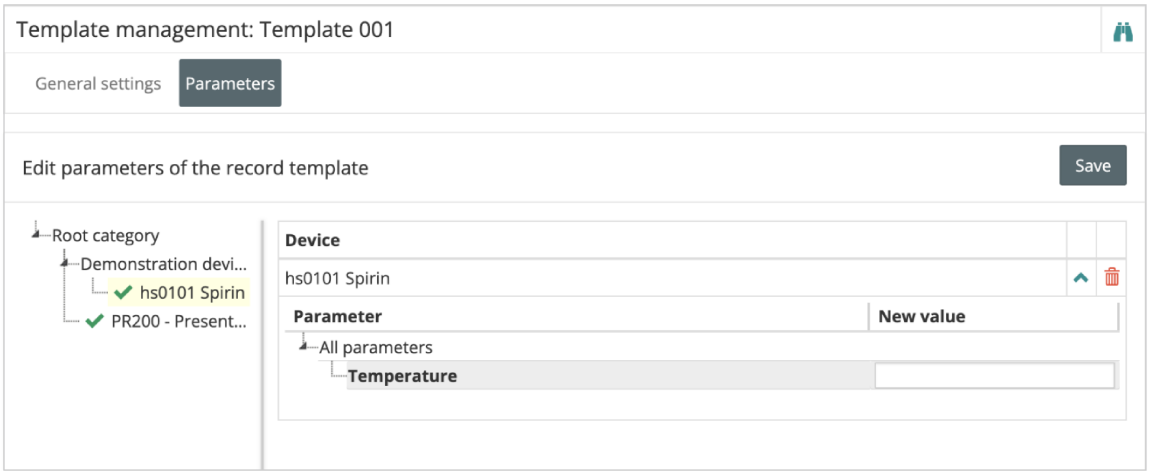
Name – enter a name for the template.
Categories – select the groups to which the template will belong.
Description – enter a description for the template.

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Do not record if values changed in the device during recording – check the box to prevent recording a new parameter value if the old value has changed.
Click the **Save** button. A window will appear:



Repeat attempts for – specify the time interval for retrying recording attempts if the first attempt is unsuccessful.
Open the **Parameters** tab. A window will appear:

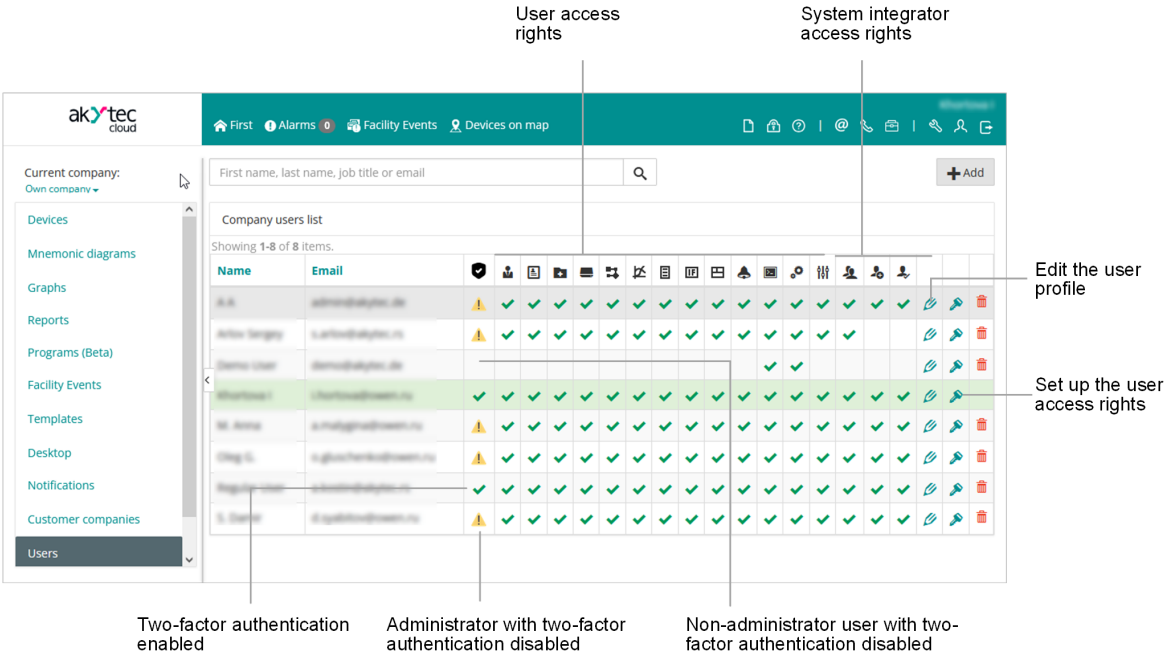


Select one or more devices.
Set the device parameter values to be applied during template recording.
Click the **Save** button. A window with a list of templates will appear.

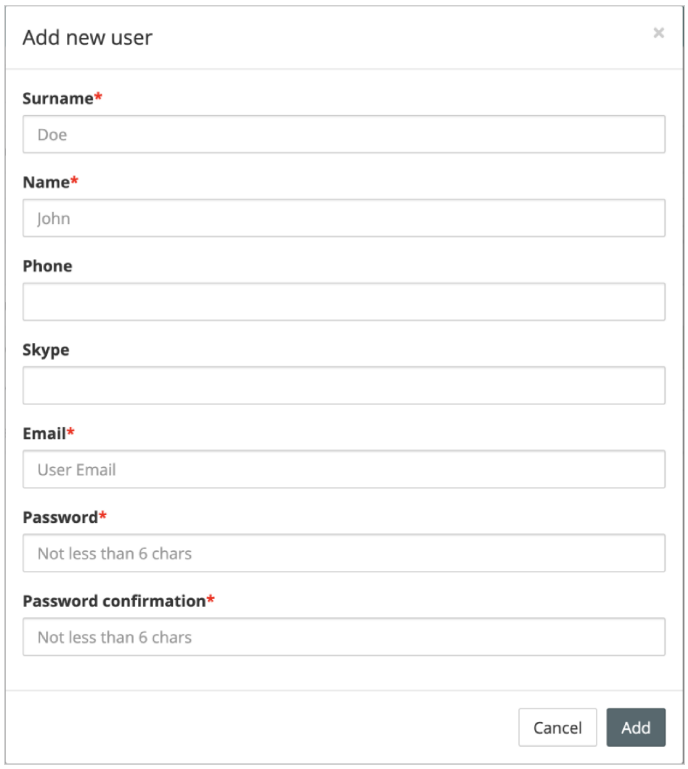
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12 Adding and configuring user rights

Open the **Users** tab in the **Administration** section. A window will appear:

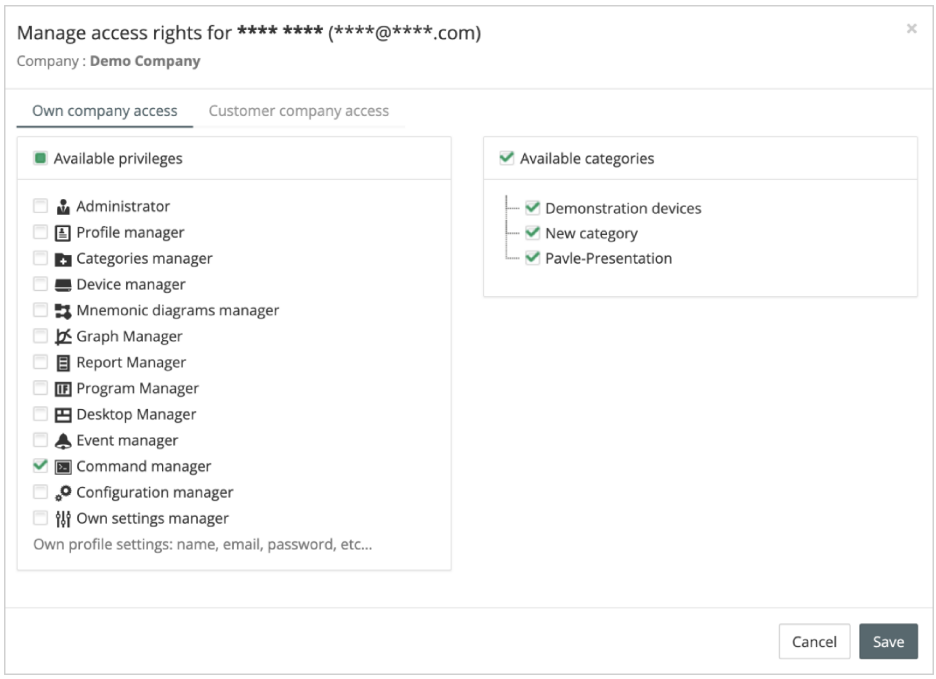


To add a user, click the **Add** button. A window will appear:



Fill in the fields with the new user's data. Click the **Add** button. A window with user access rights settings will appear:

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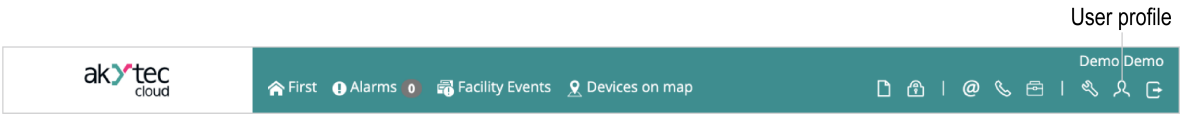


Open the **Own company access** tab. Check the boxes to grant access according to the *Rights and roles* section.
Select the available categories by checking the appropriate boxes. Click the **Save** button.

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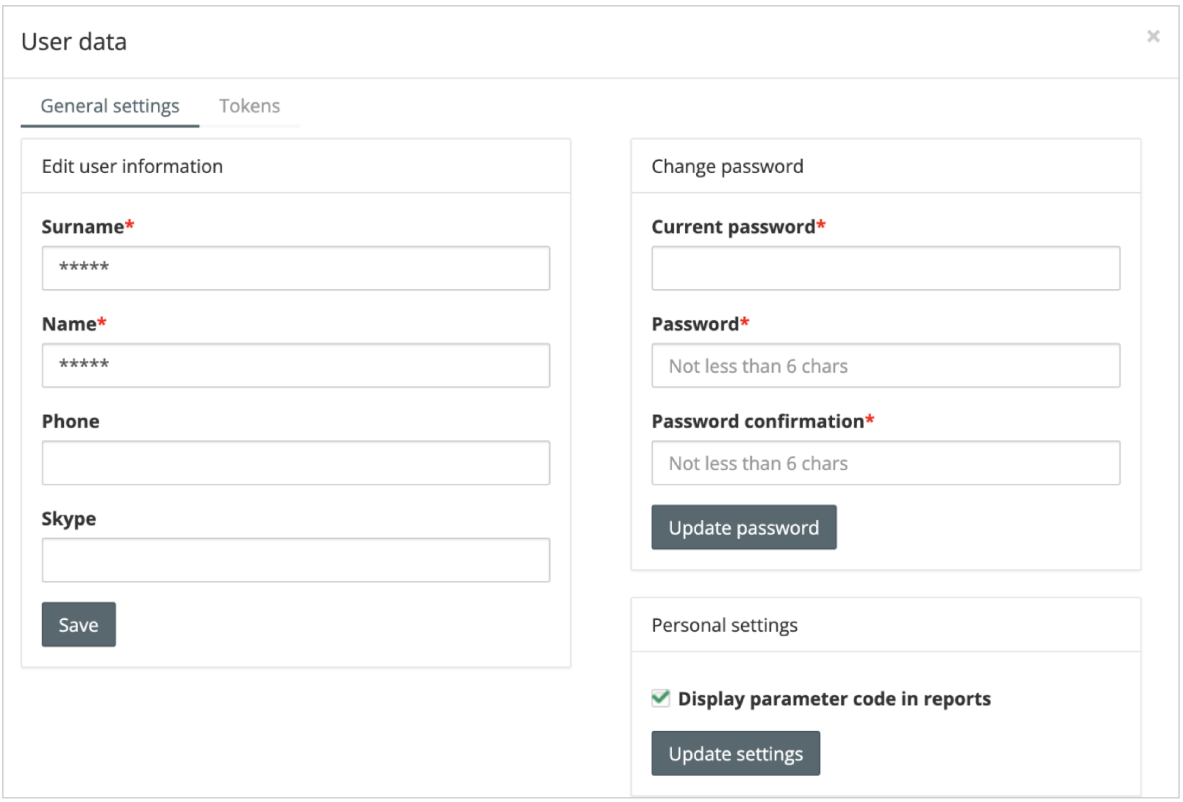
13 User profile

In the main akYtec Cloud window, navigate to the user profile:



13.1 Editing the user data

In the user profile, open the **General settings** tab. A window will appear:



If necessary, update the user data in the **Edit user information** and **Change password** sections. To display the parameter code in the Parameters, Tables, Graphs and Events reports, click on the checkbox in the **Personal settings** section. Click the **Update settings** button.

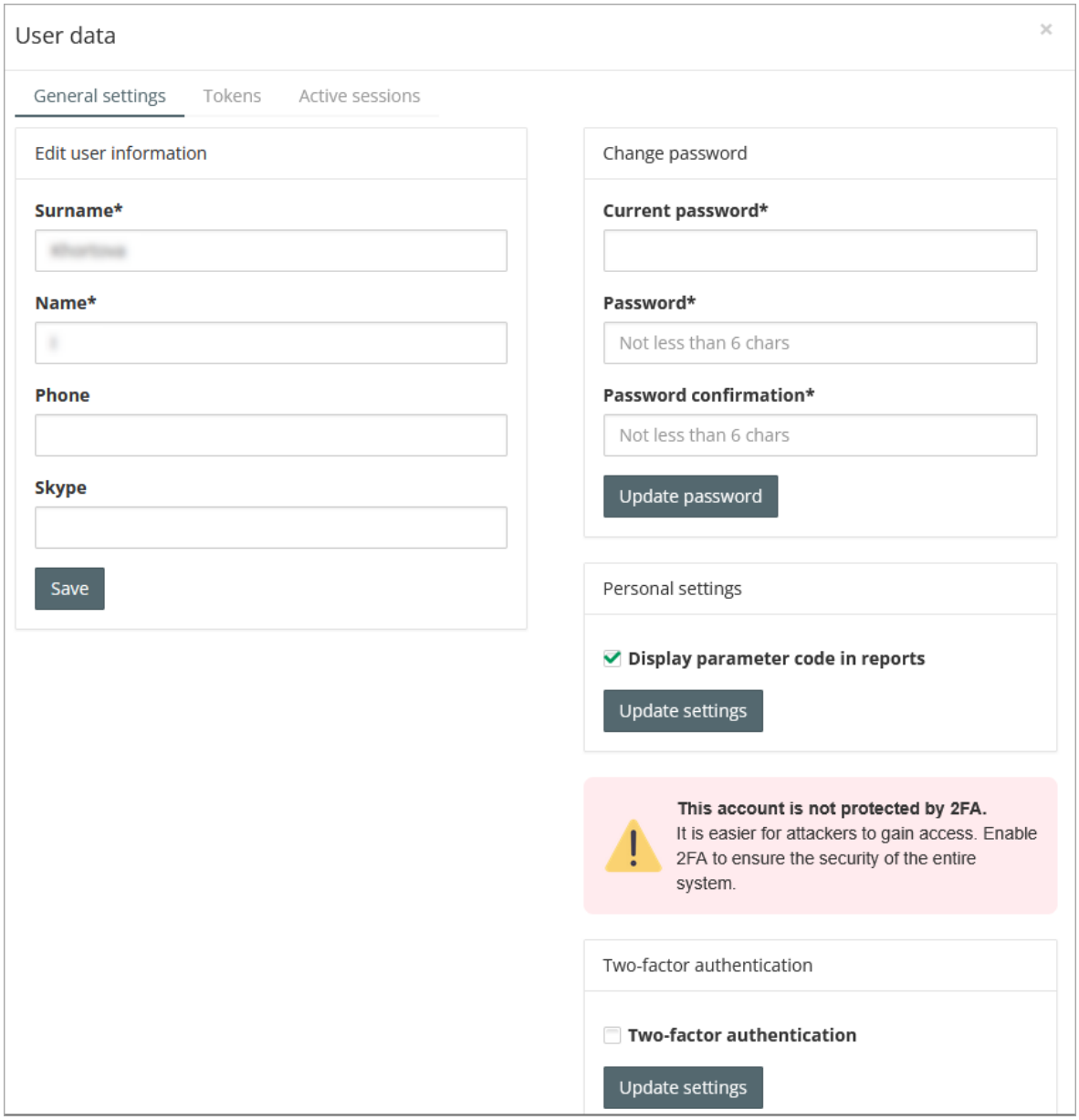
13.2 Enabling / disabling two-factor authentication

Navigate to the user profile and open the **General settings** tab.

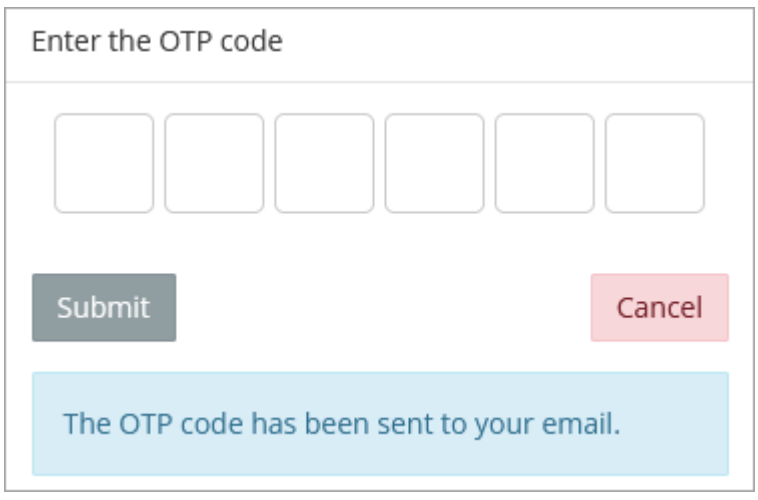
NOTICE
To enable two-factor authentication, you must have access to the email address used when adding the user. A confirmation code will be sent to this email.

The following window will appear:

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In the **Two-factor authentication** section, check the box to enable two-factor authentication, then click the **Update settings** button
In the window that appears, enter the one-time code sent to your email from *attention@akytec.de* and click the **Submit** button. The code is valid for 5 minutes from the time it is sent.



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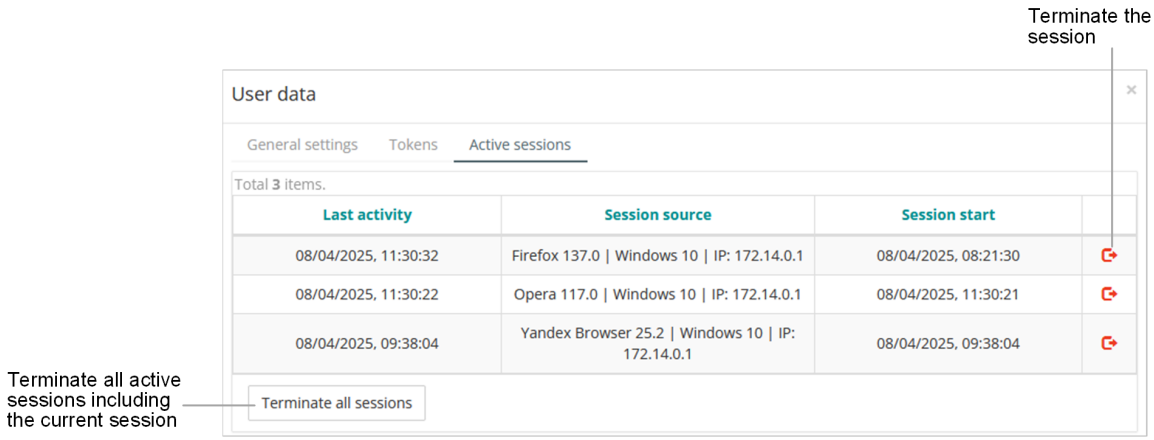
NOTE
If you didn't receive the email with the code, check your **Spam** folder.

NOTICE
If you enter an incorrect code 3 times, you can try again after 1 hour. If you enter the code incorrectly one more time, your login/password will be temporarily frozen. In this case, please contact technical support at *info@akytec.de*.

A message will appear confirming that two-factor authentication has been successfully enabled
To **disable** two-factor authentication (not recommended), uncheck the **Two-factor authentication** box and click the **Update settings** button.
In the window that appears, enter the one-time code sent to your email and click **Submit**.

13.3 Viewing and terminating active sessions

Navigate to the user profile and open the **Active sessions** tab. A window will appear showing all of the user's active sessions.



If necessary, terminate all or specific sessions.
The window displays the following information for each active session:

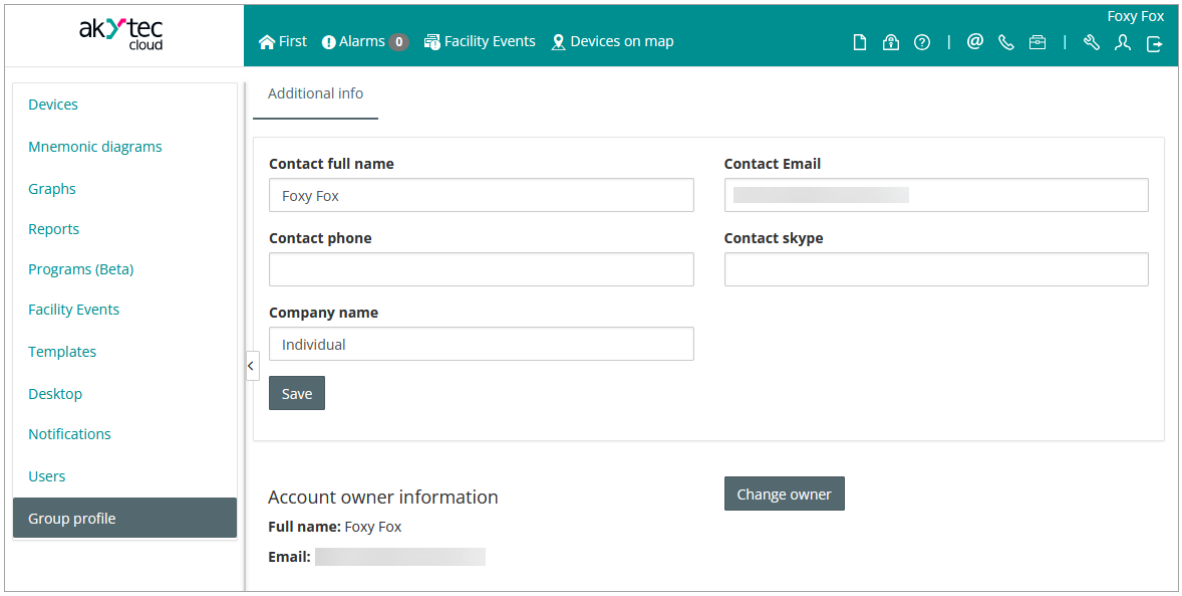
– **Last activity** — Date and time of the last activity
– **Session source** — browser, browser version, operating system, and IP address from which the session was initiated
– **Session start** — Date and time the session began

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14 Company profile and account owner

14.1 Viewing and editing the company information

Open the **Group profile** tab in the **Administration** section. A window will appear:



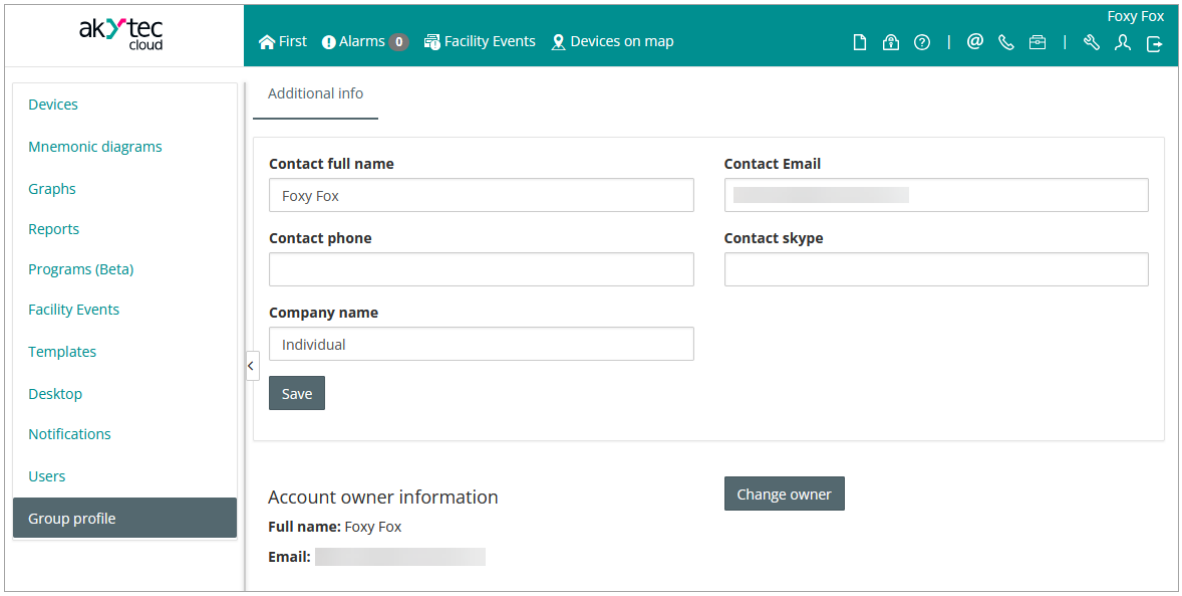
If necessary, update the company information. Click the **Save** button.

14.2 Viewing information and transferring account owner rights

akYtec Cloud provides a role of account owner to enhance security. Other administrators cannot change access rights and delete the account owner.

NOTE
Account owner rights can only be transferred once every 24 hours.

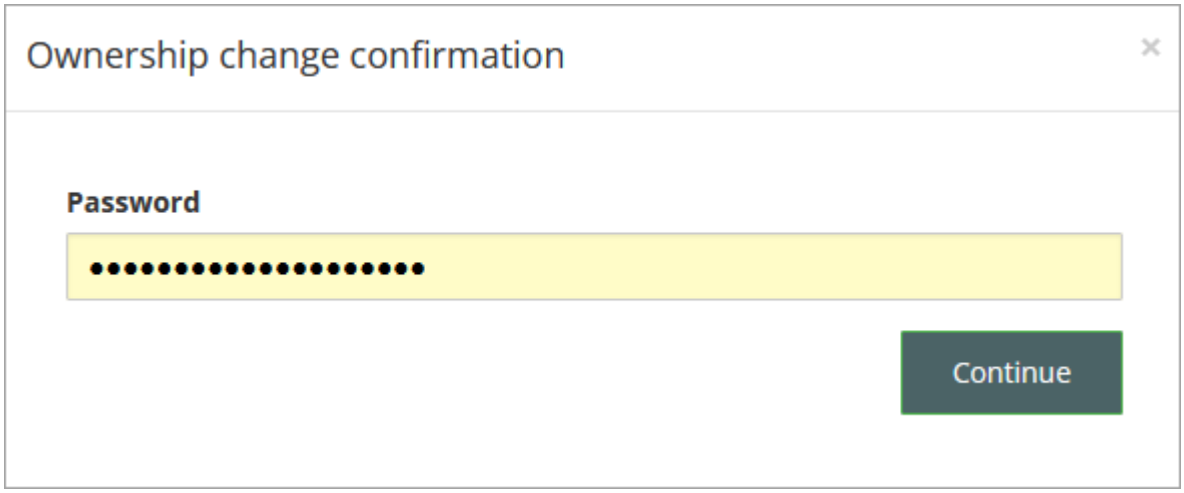
Open the **Group profile** tab in the **Administration** section. A window will appear:



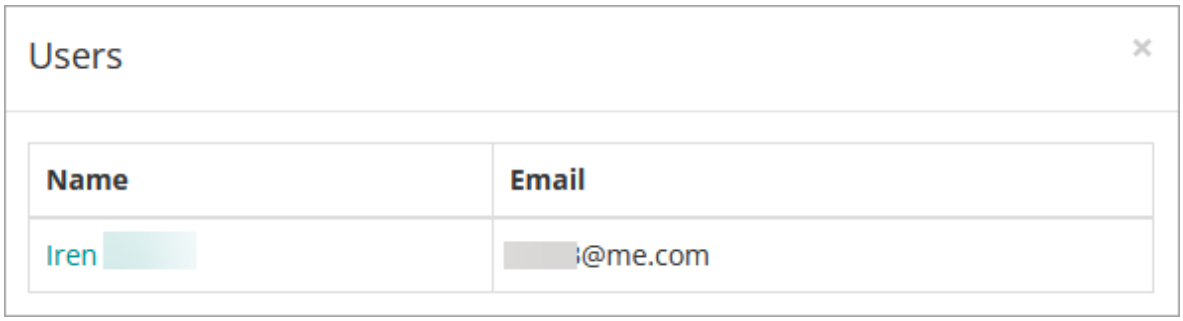
The **Account owner information** section displays the full name and email address of the user who currently owns the account.
The account owner has the option to transfer rights to another user.

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To transfer account owner rights, click the **Change owner** button. A window will appear. Enter the account password and click the **Continue** button.

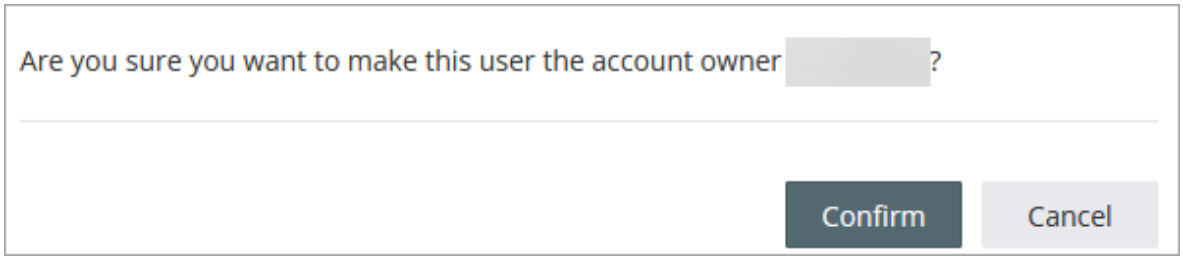


When transferring the profile owner rights with two-factor authentication enabled, you should enter the confirmation code received by email. Click the **Confirm** button.
A window will appear.



NOTICE
Owner rights may only be transferred to a user with administrator rights.

Select the user to whom you want to transfer account owner rights from the user list.
A confirmation window will appear. Click the **Confirm** button.



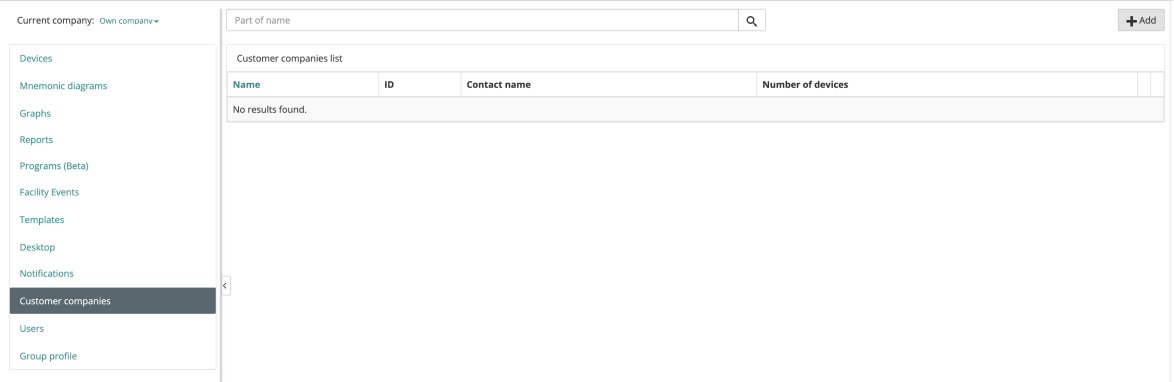
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15 Company administration (system integrator status)

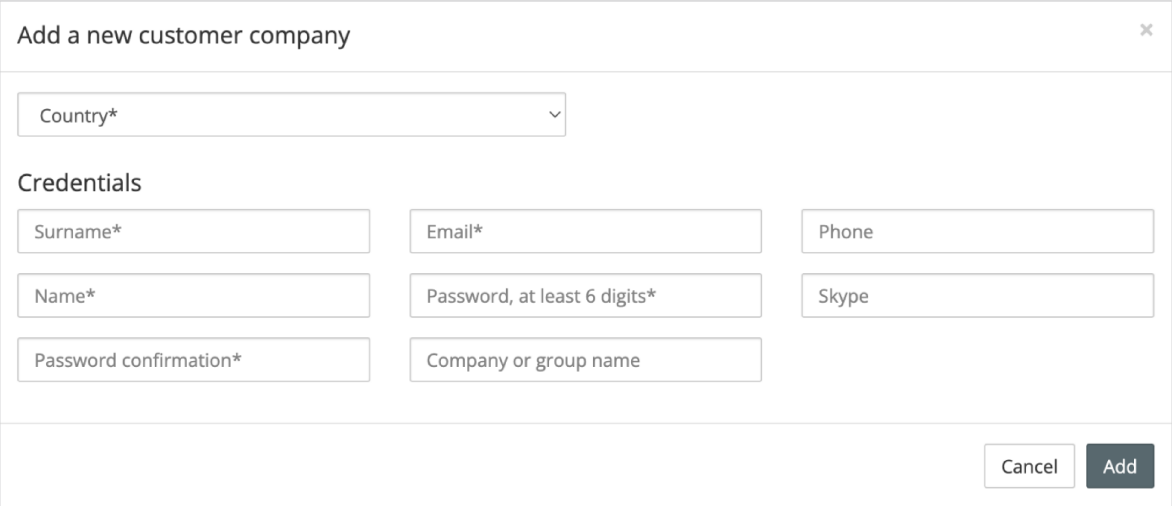
The system integrator status is designed to allow the distribution of devices from different customer companies into their own accounts with the ability to monitor the operation of the customer's equipment.
A customer company can be either an individual or a legal entity
To become a system integrator, send a request to ***info@akytec.de***.

15.1 Adding a customer company

A customer company is added as an individual. If you need to change it to a legal entity, send your request to ***info@akytec.de***.
Open the **Customer companies** tab in the **Administration** section. A window will appear:



To add a customer company, click the **Add** button. A window will appear:

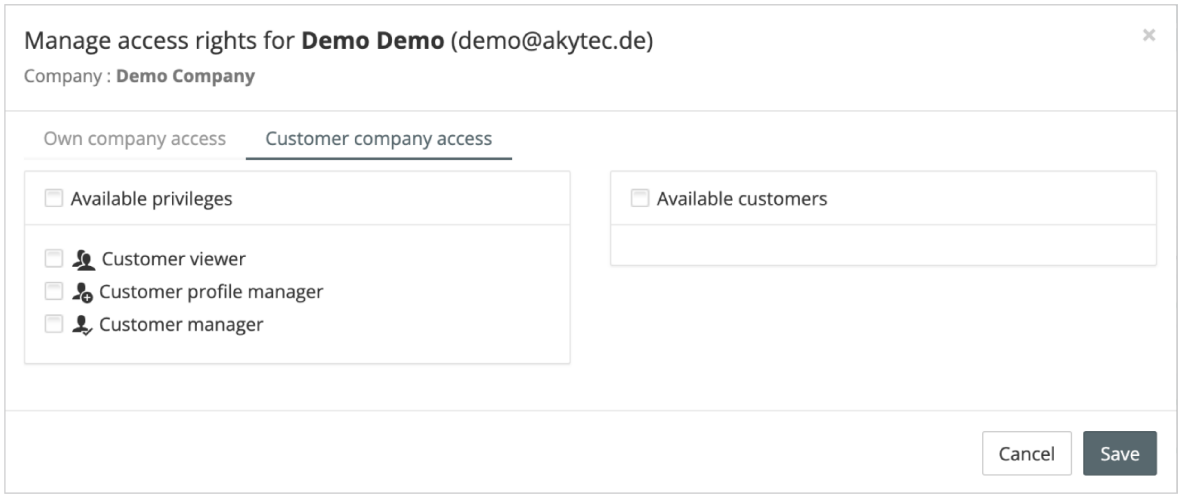


Fill in the credentials. Click the **Add** button.

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15.2 Configuring user access rights to customer companies

Open the **Customer company access** tab. A window will appear:



Check the boxes to grant access according to privileges:

	Operations with devices, templates, reports and customer company desktops	**Operations with the customer company profile**	**User administration**
Customer viewer	View	View	No
Customer viewer + **Customer profile manager**	View	View Create Edit (without deleting)	No
Customer viewer + **Customer manager**	View Add, Edit Delete	View Create Delete (without editing)	Create Edit Delete

Select the customer companies by checking the appropriate boxes. Click the **Save** button.

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16 Integration

16.1 API

Third-party software can interact with **akYtec Cloud** using a *REST*-like programming interface (*API*). The API is designed to access the data available in the service. *JSON* is the primary output format, but the customers can also request data in *XML* format.
API documentation is available at: *https://api.akytec.com/*.
akYtec Cloud enforces a limit on the number of requests that can be processed within a 10-second interval from a single IP address. The timing starts with the first request in a new request sequence. If the limit is exceeded, a status code **429 (Too Many Requests)** is returned. The limits are as follows:

– /v1/parameters/last-data – no more than 10 requests in 10 seconds
– /v1/device/index – no more than 10 requests in 10 seconds
– /v1/parameters/data – no more than 10 requests in 10 seconds
– /v1/auth/open – no more than 10 requests in 10 seconds
– /v1/parameters/write-data – no more than 1 request in 10 seconds
– all other requests – no more than 30 requests in 10 seconds.

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17 Connection of akYtec devices

17.1 Connection over RS485 (via gateway)

Device setup

1. Configure the network settings on the device according to the device user guide.

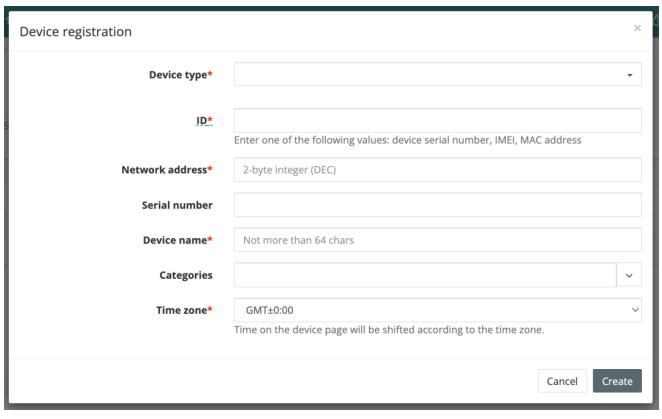
Table 17.1 Network settings

Network settings for devices with the Modbus protocol	Network settings for devices with the akYtec protocol
Baud rate	Baud rate
Data bits	Data bits
Parity	Parity
Stop bits	Stop bits
Device address	Device address
Data exchange protocol	Data exchange protocol
-	Network address length

2. Reboot the device to apply the settings.
3. Connect the device to the gateway and configure the network gateway according to the gateway user guide:
   – Connect the device via the RS485 interface to the network gateway.
   – Power on the network gateway and the device.
   – If necessary, configure the gateway:
      – for GW–24–Cloud: Specify the access point and DHCP server or static IP.
      – for GE–24–Cloud: Specify DHCP server or static IP.
      – for GG–24–Cloud: If necessary, configure the access point (APN).

Adding the device and gateway to akYtec Cloud

1. Open the **Devices** tab in the **Administration** section. Click the **Add device** button. A window will appear:



Specify the following settings for the device and gateway:

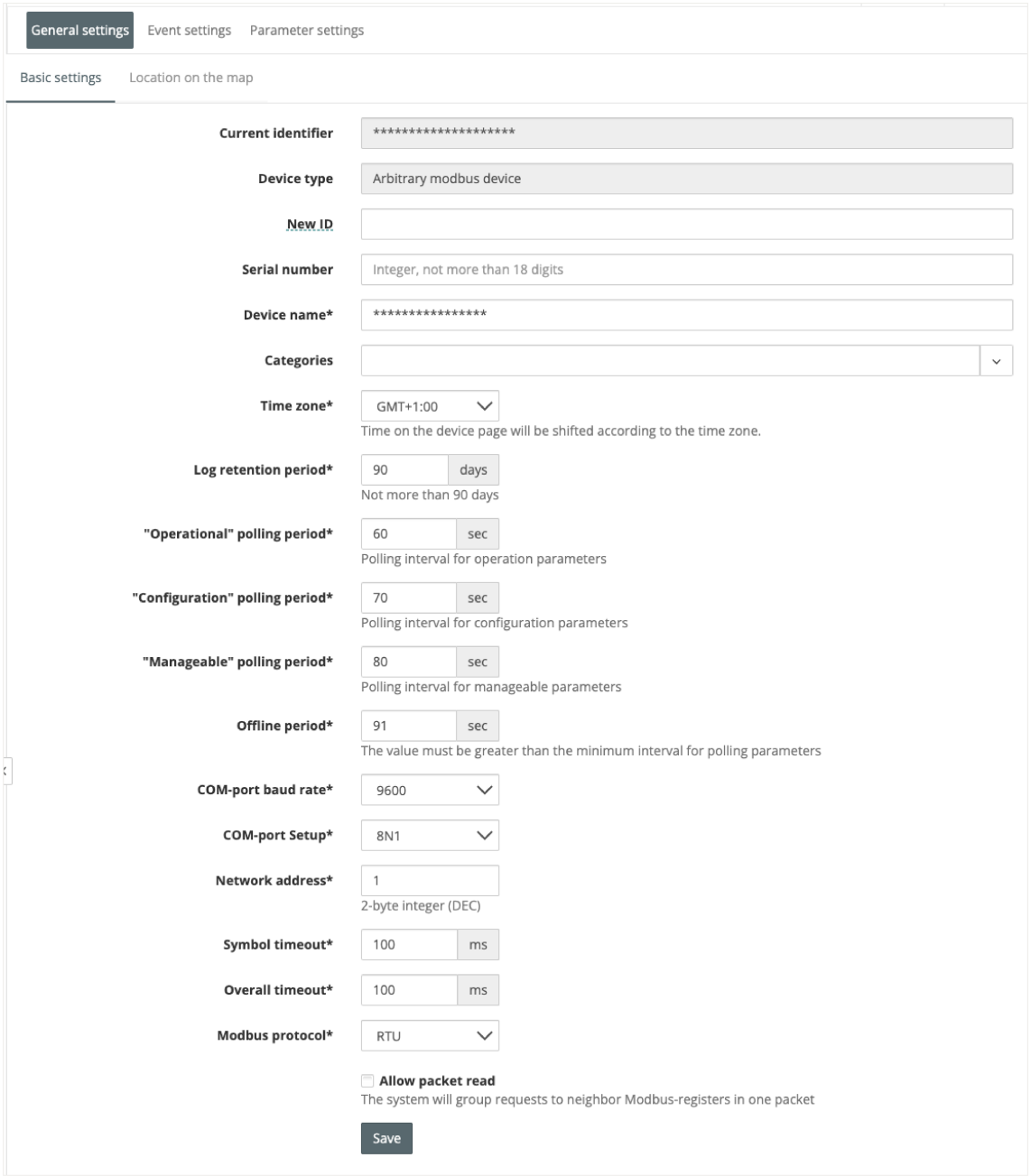
– **Device type:** Select the device to be connected.
– **ID:** Enter the network gateway ID (as indicated on the gateway enclosure):
   – For GG–24–Cloud, GE–24–Cloud, GW–24–Cloud – enter serial number of the gateway (as indicated on the gateway enclosure).

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– **Network address:** Enter the device address in the RS485 network , as set during device setup (see *Table 17.1*);
– **Serial number:** Enter the device serial number.
– **Device name:** Enter the device name.
– **Categories:** Select the groups to which the device will belong.
– **Time zone:** Select the time zone in which the device is located.

Click the **Create** button.

2. Select **Basic settings / General setting** in the device settings, and specify the previously configured device network settings (see *Table 17.1*). A window will appear:



– **COM-port baud rate:** Set the COM port speed.
– **COM-port Setup:** Select the COM port settings, in the following format:
  – Number of information bits per byte. Possible options: 7, 8.
  – Parity mode. Possible options: N - none, E - even, O - odd.
  – Stop bits. Possible options: 1, 2.

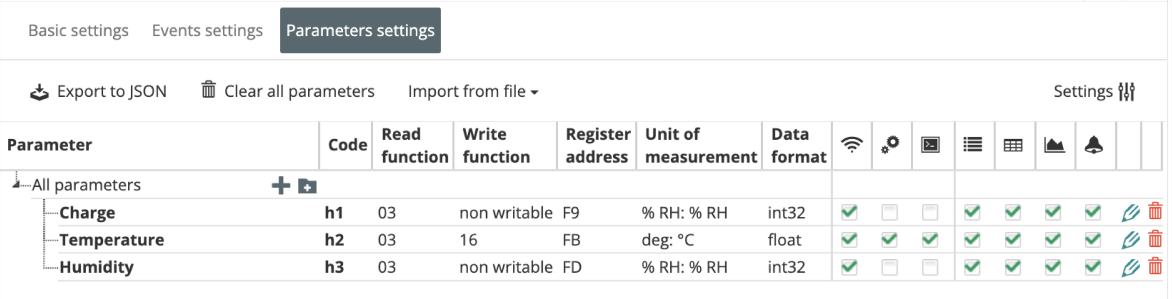
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Example: 8N1 - 8 data bits, no parity, 1 stop bit.

- **Device parameters polling periods:** Set the polling periods of operational, configuration and **manageable** parameters (see *General device settings (basic settings)*);
- **Symbol timeout:** The waiting time for the next byte of data. The recommended value is 100 ms.;
- **Overall timeout:** The waiting time for the complete data packet to be received. The recommended value is 600 ms.;
- **Allow packet read:** Check the box to enable faster data exchange (only if the connected device supports batch reading ;check in the device user guide).

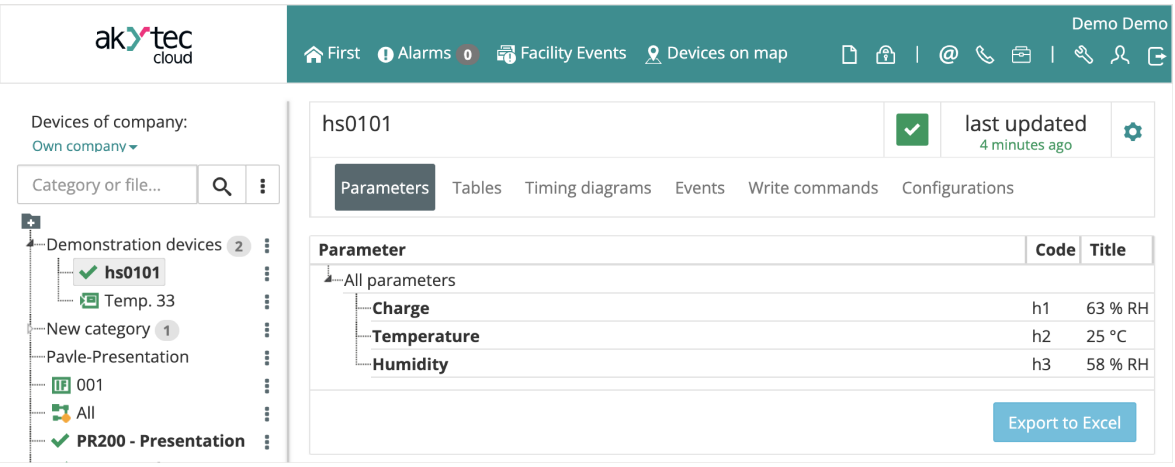
Configuring device settings in akYtec Cloud

In the **Administration** section, open the **Devices / Parameter setup** tab and specify the parameters to be displayed in the reports (see *Customizing the display of parameters in reports*):



Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . The main akYtec Cloud window with the **Parameters tab** will appear.
To verify that the parameter values have been recorded to the device, click the **Write commands** tab.



CAUTION
To enable verification, the list must include parameters of the **manageable** type.

17.2 Connection over Ethernet

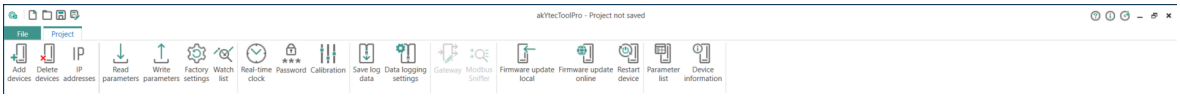
The Mx210 modules are connected via Ethernet.
akYtec devices with Ethernet connectivity must be connected to a local network with internet access.

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Configuring the device in akYtec Tool Pro

1. Connect the device to a PC according to the device user guide.

2. Install and launch akYtec Tool Pro.
3. Use akYtec Tool Pro to connect to the device, then click the **Read parameters** button.



In the **Network settings / akYtec Cloud connection settings** section, set **Connection to akYtec Cloud** to On.
In the **Modbus Slave** / **Remote access rights from akYtec Cloud** section, set the following:

– Configuration enable - enabled
– Manage and record values - enabled
– Access to Modbus registers - full access.

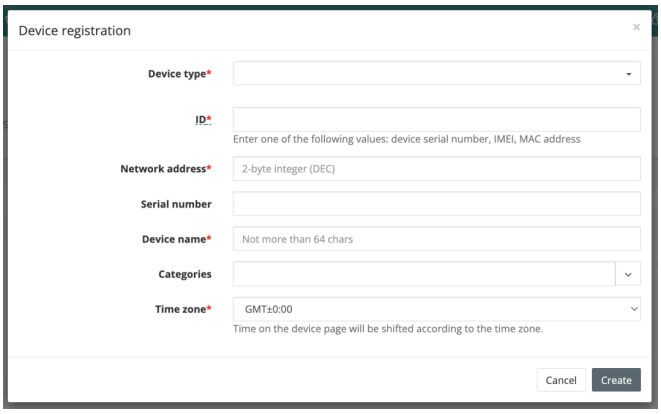
In the **Ethernet settings** tab, configure the device network settings according to the network requirements (IP address, subnet mask, gateway). Then click the **Write parameters** button.
To set the password for accessing the device from akYtec Cloud, click **Set Password**.

CAUTION
If no password is set, you will not be able to connect the device to akYtec Cloud.

Reboot the device to apply the changes.

Adding the device to akYtec Cloud

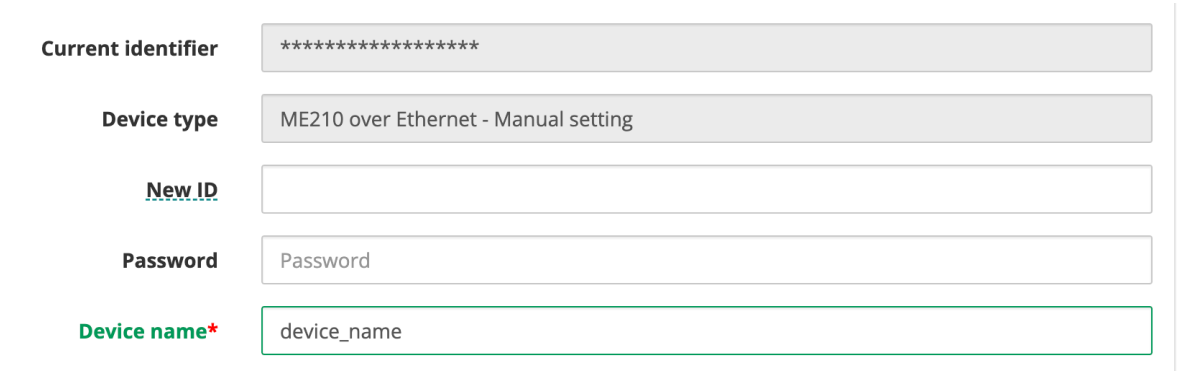
Connect the device to a LAN with Internet access.
Open your browser and navigate to *https://cloud.akytec.de/*, then log in. The main akYtec Cloud window will appear.
In the **Administration** section, open the **Devices** tab and click the **Add device** button. A window will appear:



– **Device type:** Select the device to be connected.
– **ID:** Enter the device serial number (indicated on the module enclosure or copy from akYtec Tool Pro / Device information).
– **Device name:** Enter the device name.
– **Categories:** Select the groups to which the device will belong.
– **Time zone:** Select the time zone in which the device is located.

Click the **Create** button.
Click on the device name to access the device setup. Then, select **General settings / Basic settings**. Enter the password set in akYtec Tool Pro:

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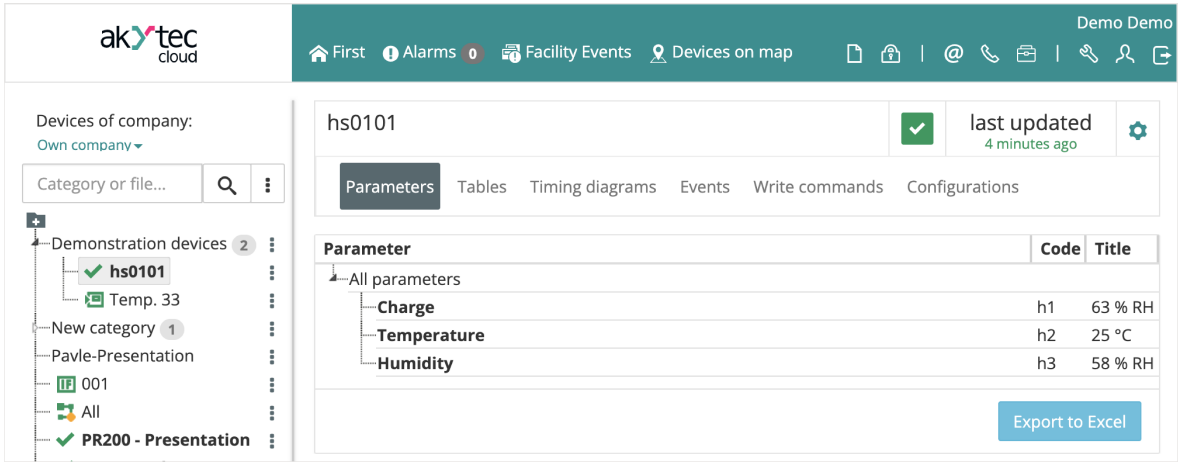


Adding device parameters to akYtec Cloud

The parameter list is automatically read from the device.

Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . The main akYtec Cloud window with the **Parameters** tab will appear.
To verify that the parameter values have been recorded to the device, click the **Write commands** tab.



NOTE
To enable verification, the list must include parameters of the **manageable** type.

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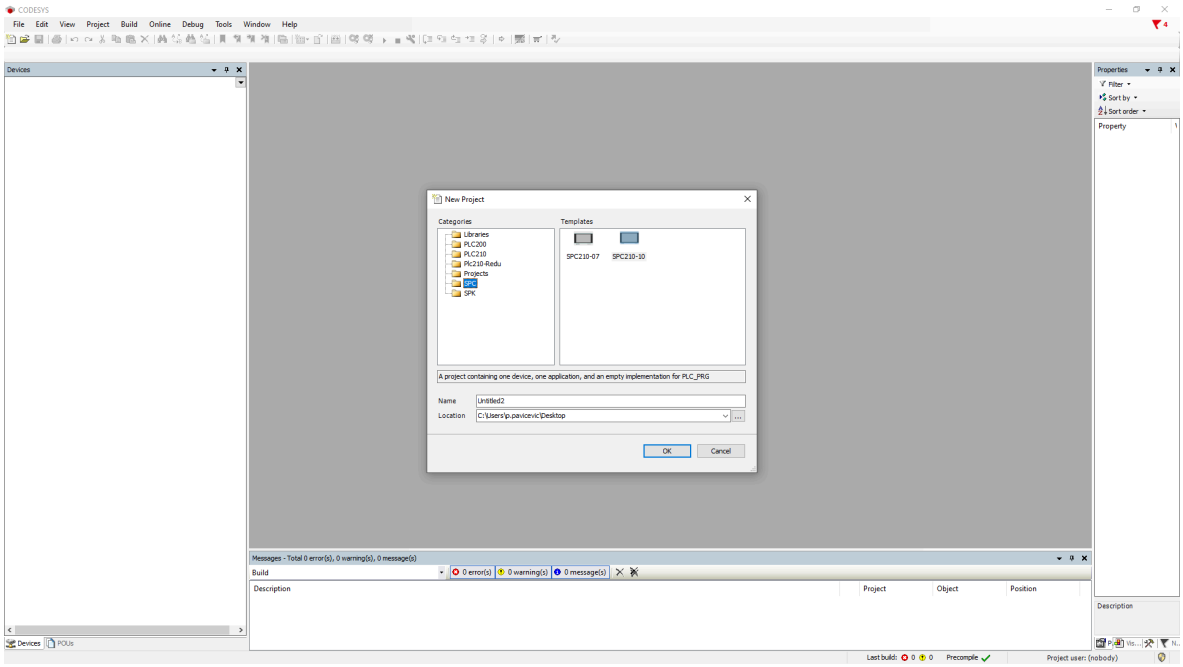
18 Connection of PLC210 and SPC210 with Codesys 3.5

18.1 Connection over RS485 (via gateway)

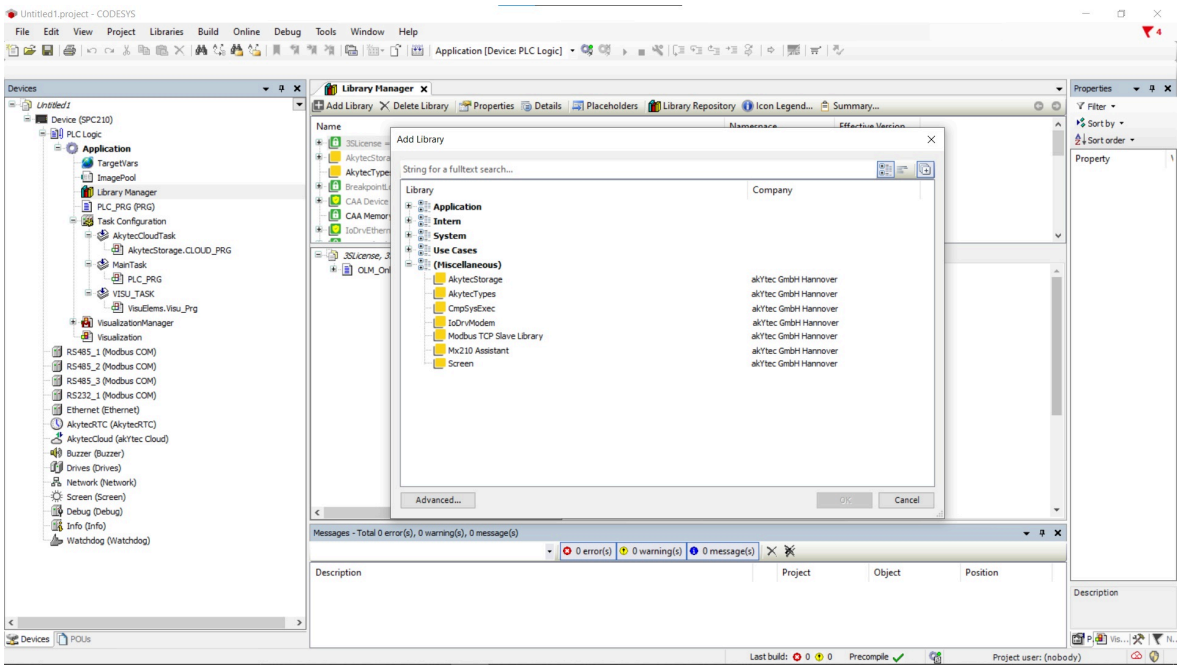
PLC210 and SPC210 are connected as described in this section.

Creating a project in the CODESYS 3.5 environment

Start CODESYS 3.5 and connect to the device. A window will appear:

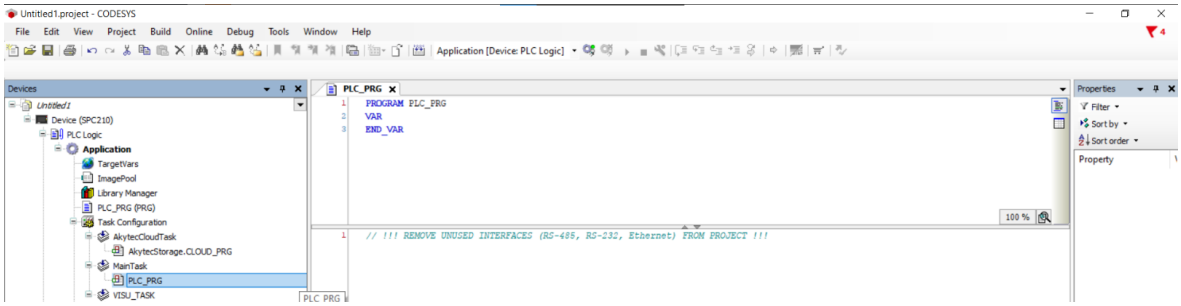


Install the **akYtec Communication** library and add it to the library manager (for details, see CODESYS V3.5. Modbus):



Declare the following variables for PLC_PRG:

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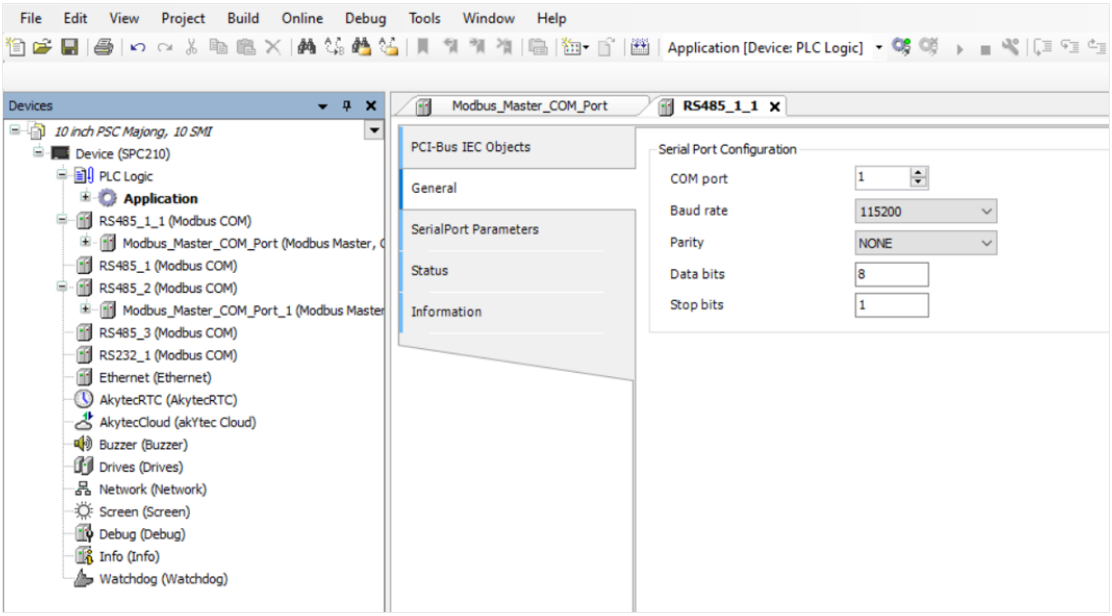
Consider the following:

– Only variables of the BOOL and WORD types can be assigned in the Modbus Slave component.
– To assign a REAL variable, you must declare two additional WORD variables:
  – For REAL variables written from akYtec Cloud, merge the two WORD variables into a REAL variable in the program code.
  – For REAL variables read by akYtec Cloud, split the REAL variable into two WORD variables in the program code.

```
rVar_Write := OCL.WORD2_TO_REAL(wRealVarReg0_Write, wRealVarReg1_Write, FALSE);

fbRealToWord2(rInput := rVar_Read, xSwapBytes := FALSE, wOutput1 => wRealVarReg0_Read, wOutput2 => wRealVarReg1_Read);
```

Select the RS485_1 (Modbus COM) component:

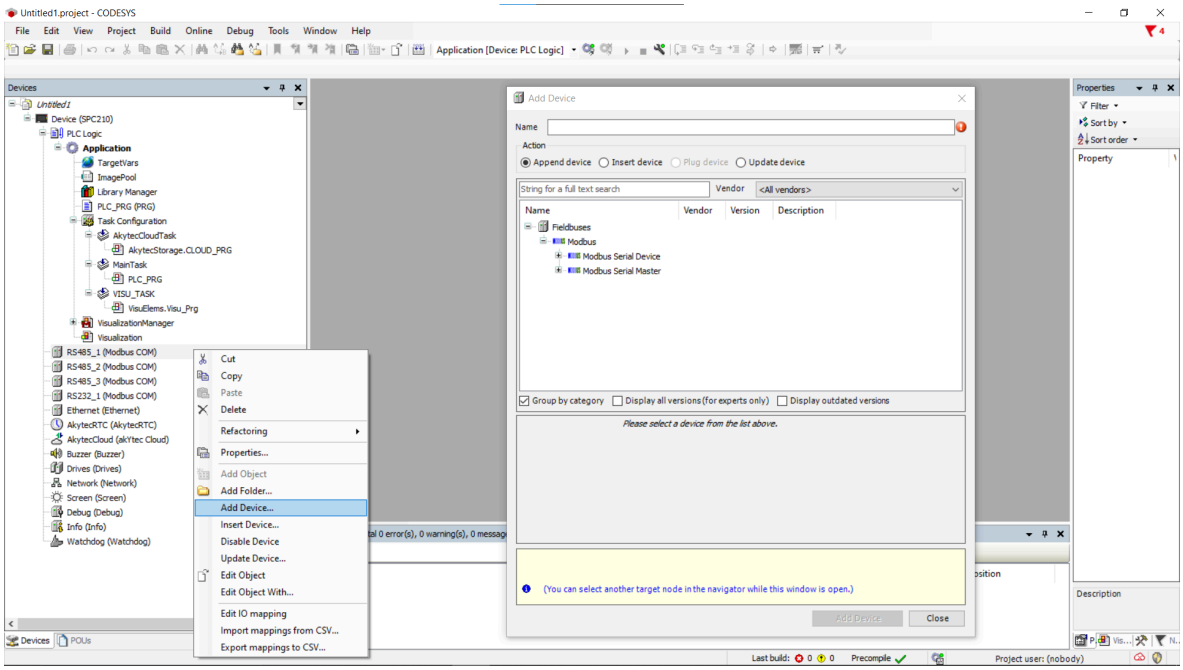


Specify the parameters for the **Modbus COM** component:

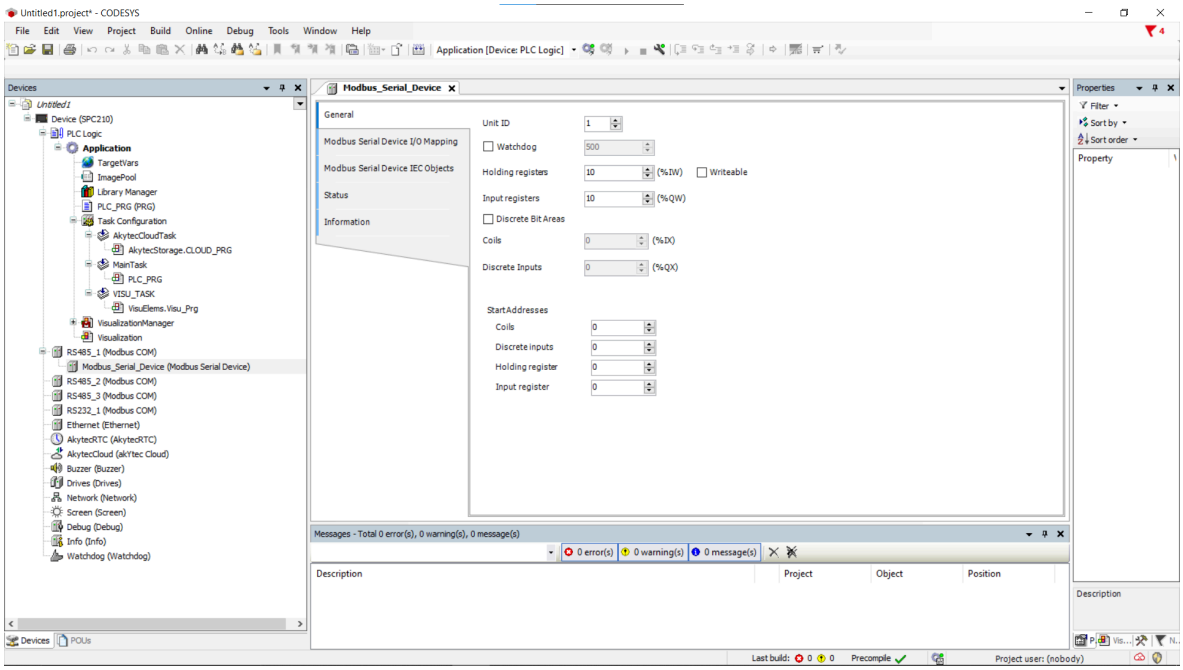
– COM port number - used to connect the GG-24–Cloud network gateway
– baud rate
– parity
– data bits
– stop bits.

Add **Modbus Serial Device**:

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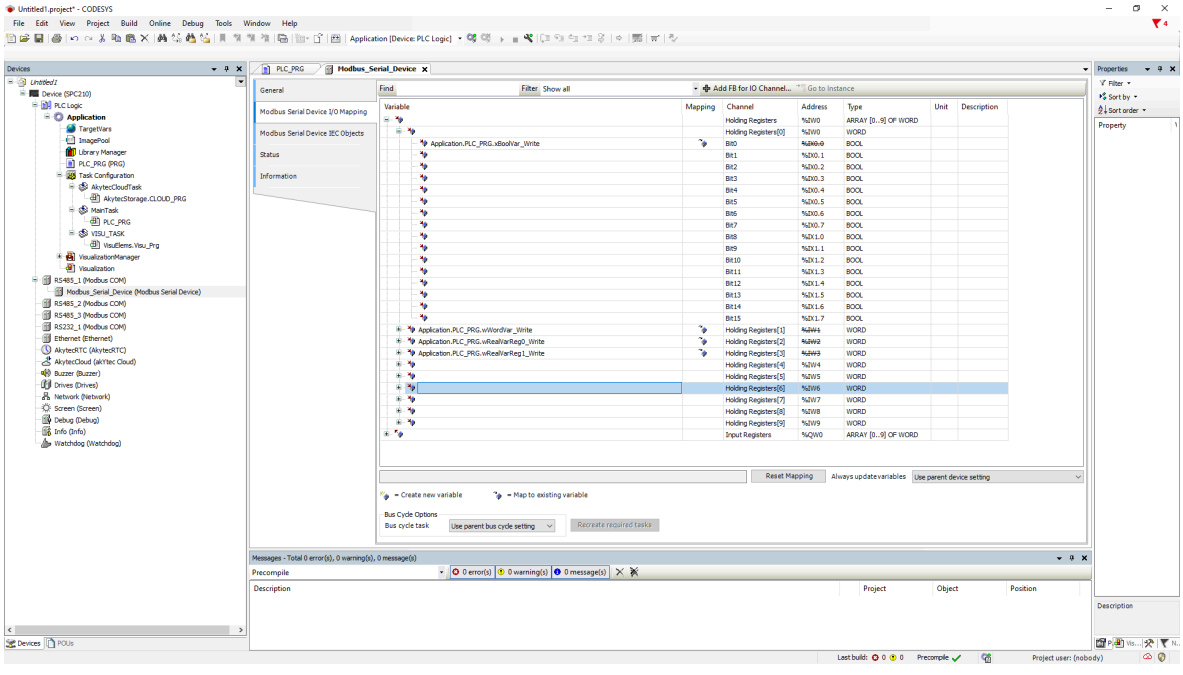


Open the **Modbus Serial Device** tab and enter the slave address of the device:

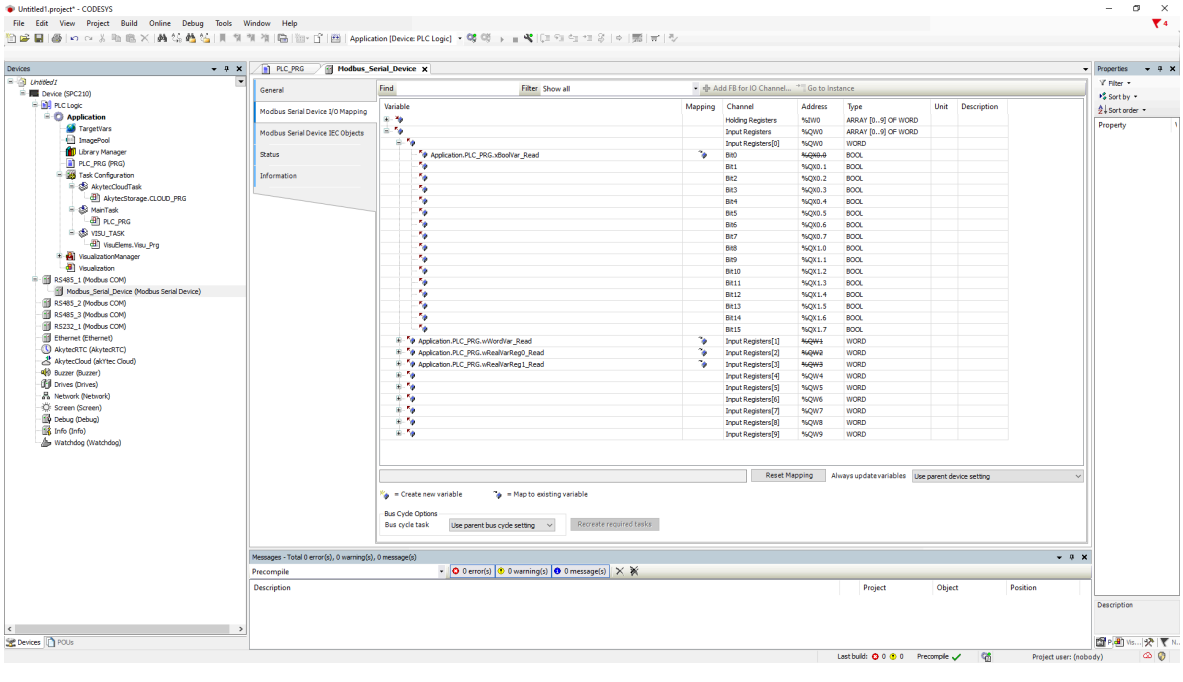


On the **I/O Mapping** tab, assign the variables to the slave registers:

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Set the value of the **Always update variables** parameter to **Use parent device setting**.
The **Write** variable refers to holding registers.
The **Read** variable refers to input registers.



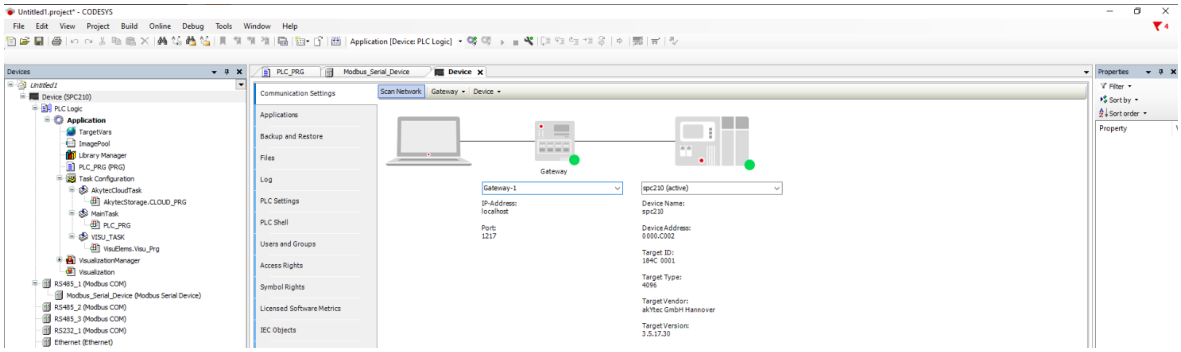
Addressing for each Modbus memory area is independent and starts from register 0 .
As a result, the following register map will be generated in the controller (note that variables of the REAL type are represented in Modbus Slave as two variables of the WORD type):

Variable name	Type	Modbus area	Register / bit address
xBoolVar_Write	BOOL	Coils	0/0
wWordVar_Write	WORD	Holding registers	1
rVar_Write	REAL	Holding registers	2–3
xBoolVar_Read	BOOL	Discrete inputs	0/0

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Variable name	Type	Modbus area	Register / bit address
wWordVar_Read	WORD	Input registers	1
rVar_Read	REAL	Input registers	2–3

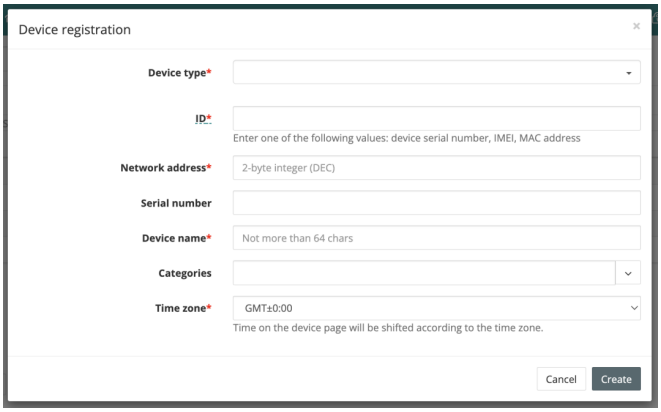
Set the IP address for the controller and scan the network to find the device.



Load the project onto the controller and start it by selecting **Online / Login and Start** (F5).
Connect the GG-24-Cloud gateway to the RS485-1 port of the controller as described in the user guide.

Adding the device and gateway to akYtec Cloud

Open your browser and navigate to *https://cloud.akytec.de/*, then log in. The main akYtec Cloud window will appear.
In the **Administration** section, open the **Devices** tab and click the **Add device** button. A window will appear:

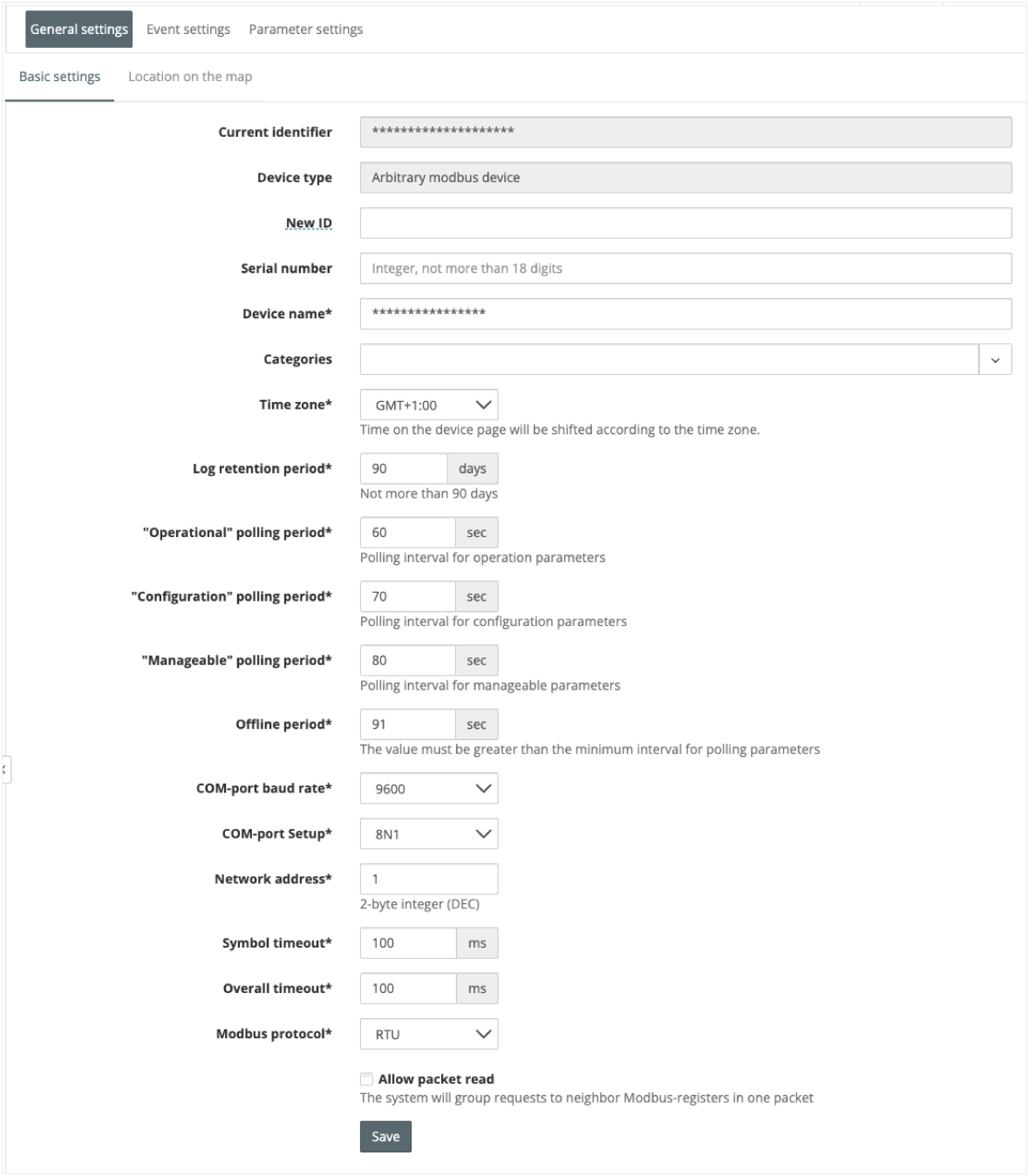


Device type – select the device to be connected.
ID – enter the network gateway ID (as indicated on the gateway enclosure):

– For GG–24–Cloud produced before 02/2022 – enter the IMEI number of the network gateway (as indicated on the gateway enclosure).
– For GG–24–Cloud, GE–24–Cloud, GW–24–Cloud – enter the serial number of the gateway (as indicated on the gateway enclosure).

Network address – enter “1”.
Serial number – enter the device’s serial number.
Device name – enter the device name.
Categories – select the groups to which the device will belong.
Time zone – select the time zone in which the device is located.
Click the **Create** button.
In the device settings, select **Basic Settings / General Settings** and specify the following:

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COM-port baud rate – set the COM port speed.
COM-port Setup – select the COM port settings in the following format:

– Number of information bits per byte of data. Possible options: 7, 8.
– Parity mode. Possible options: N - none, E - even, O - odd.
– Stop bits. Possible options: 1, 2.

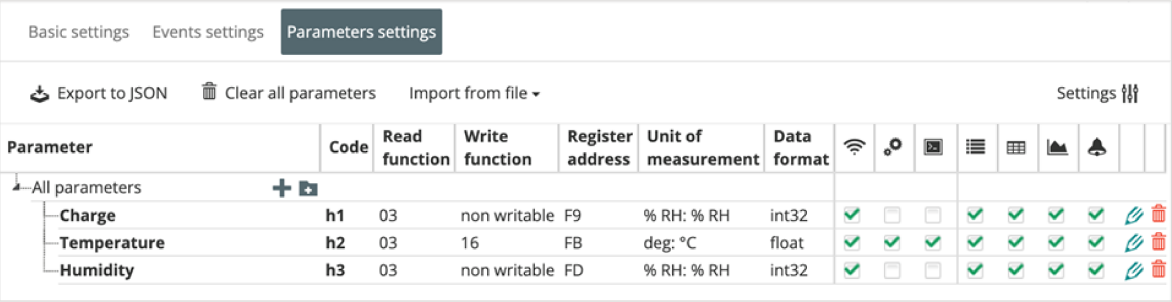
Example:
8N1 – 8 data bits, no parity, 1 stop bit.

Click the **Save** button.

Adding device parameters to akYtec Cloud

In the **Administration** section, open the **Devices / Parameter setup** tab and add the parameters according to the project in CODESYS 3.5.

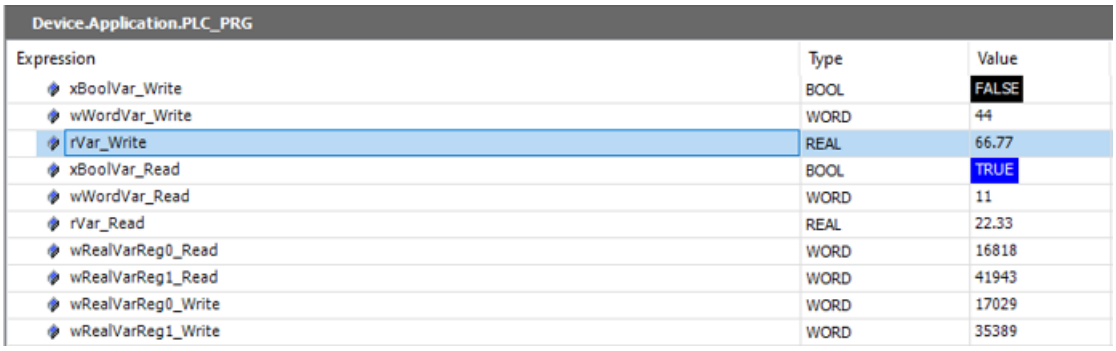
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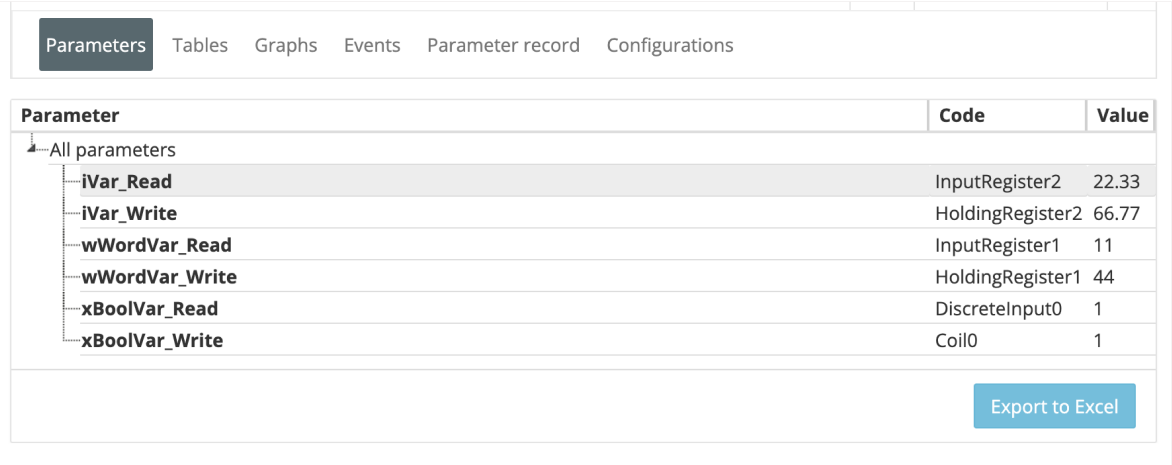


NOTE
For parameters of REAL (float) type, you must specify the required number of decimal places.

Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . The main akYtec Cloud window with the **Parameters** tab will appear.
Change the values of the variables in CODESYS 3.5 and monitor the corresponding changes in akYtec Cloud.
To verify that the parameter values have been recorded to the device, click the **Write commands** tab.





NOTE
To enable verification, the list must include parameters of the **manageable** type.

18.2 Connection over Ethernet

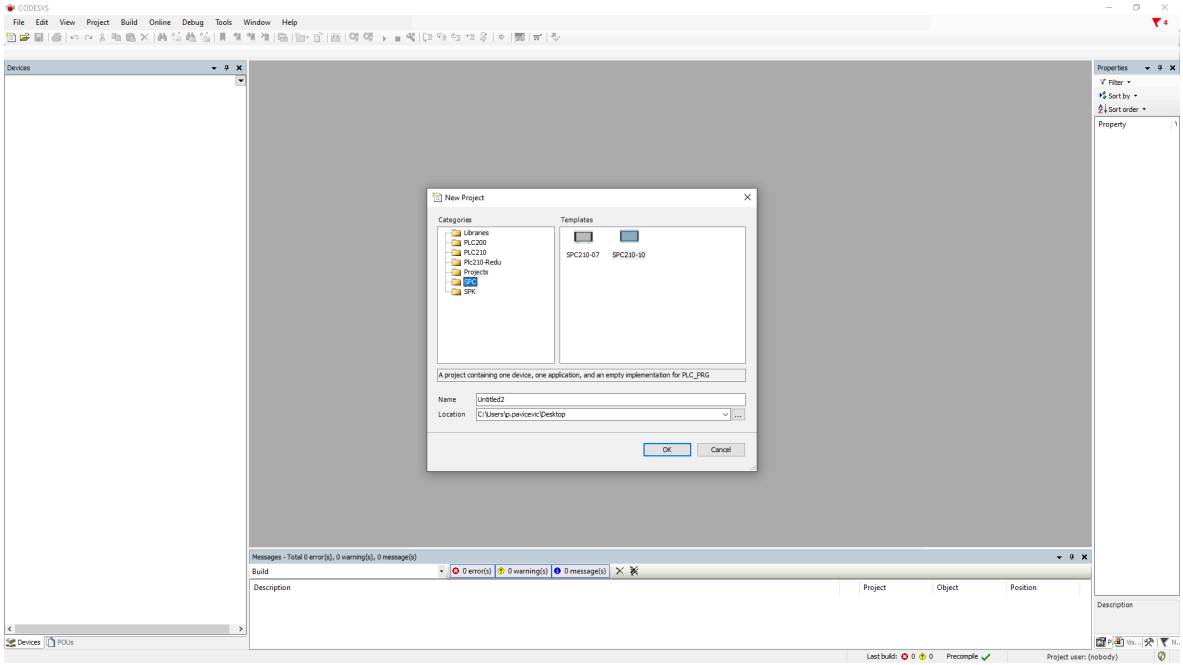
The connection between the SPC210 and PLC210, programmed in CODESYS V3.5 SP11 Patch 5 or higher, is performed via symbol configuration.
For SPC210 controllers, connection to akYtec Cloud via symbol configuration is supported starting with firmware 1.1.0611.1056. Earlier versions used connection via Modbus TCP, which is described

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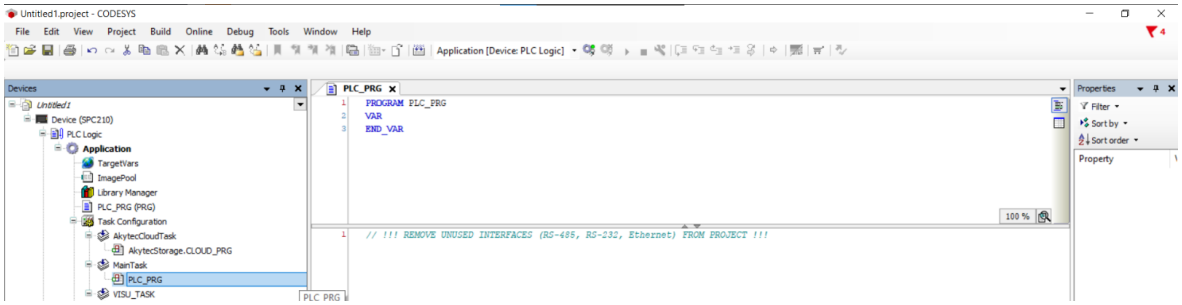
in version 2.0 of the CODESYS V3.5. Configuring exchange with the upper level is not supported in the current firmware.

Creating a project in the Codesys 3.5 environment

Create a new project in CODESYS V3.5. A new window will appear:

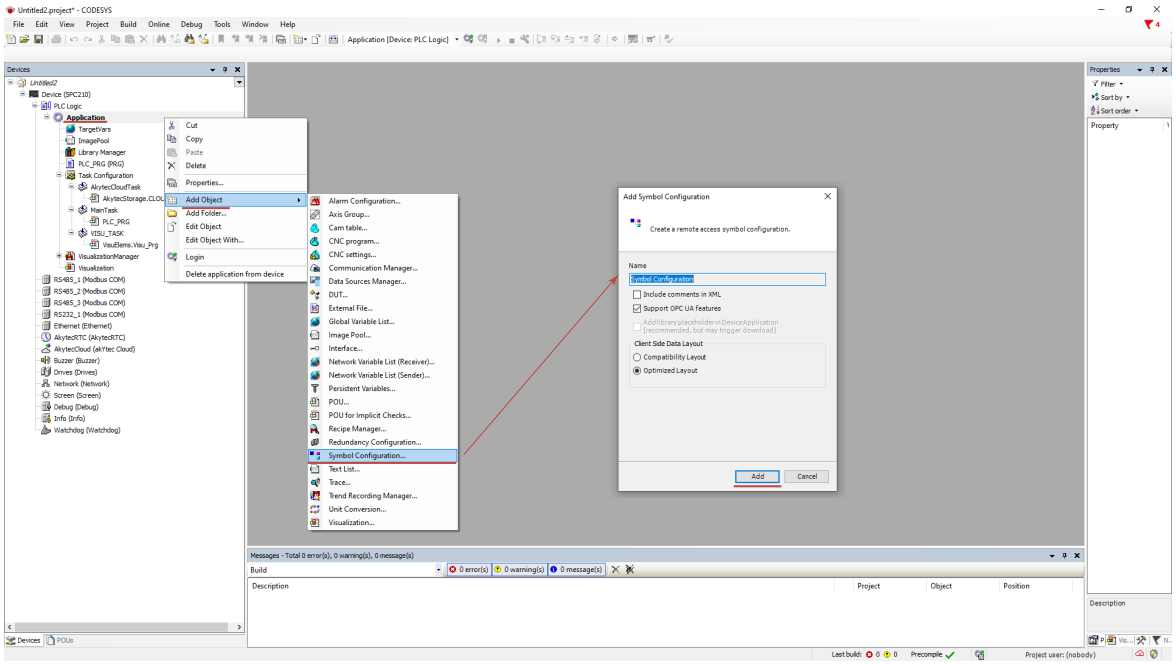


Declare variables for **PLC_PRG**:

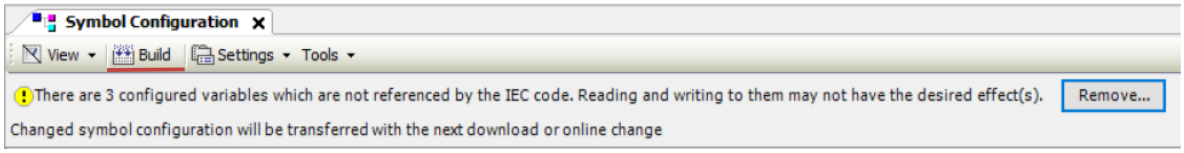


Add the **Symbol Configuration** component to the project:

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Click **Build** to compile the project.



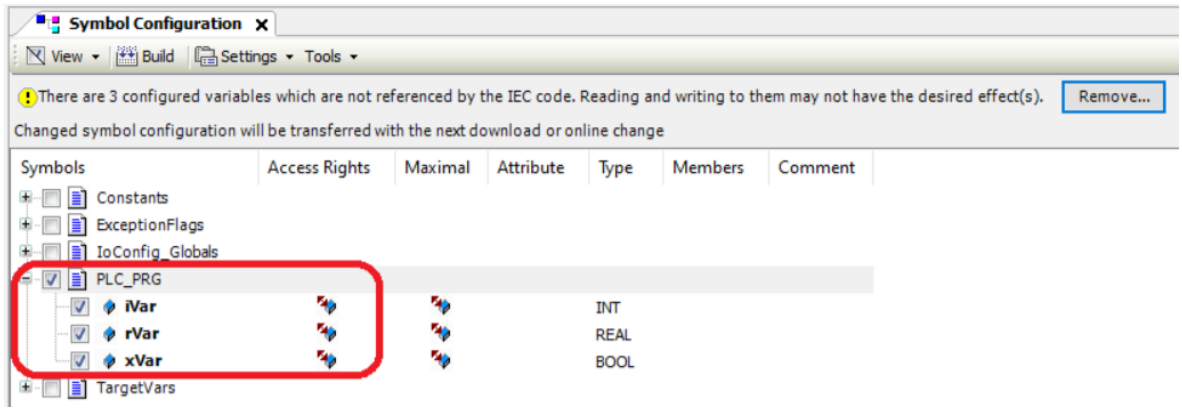
CAUTION
When adding new variables to a project, you must first compile the project in order to apply changes to the symbol configuration.

Check the boxes next to the variables that will be read / modified by akYtec Cloud, and set access rights for each one:

– read only

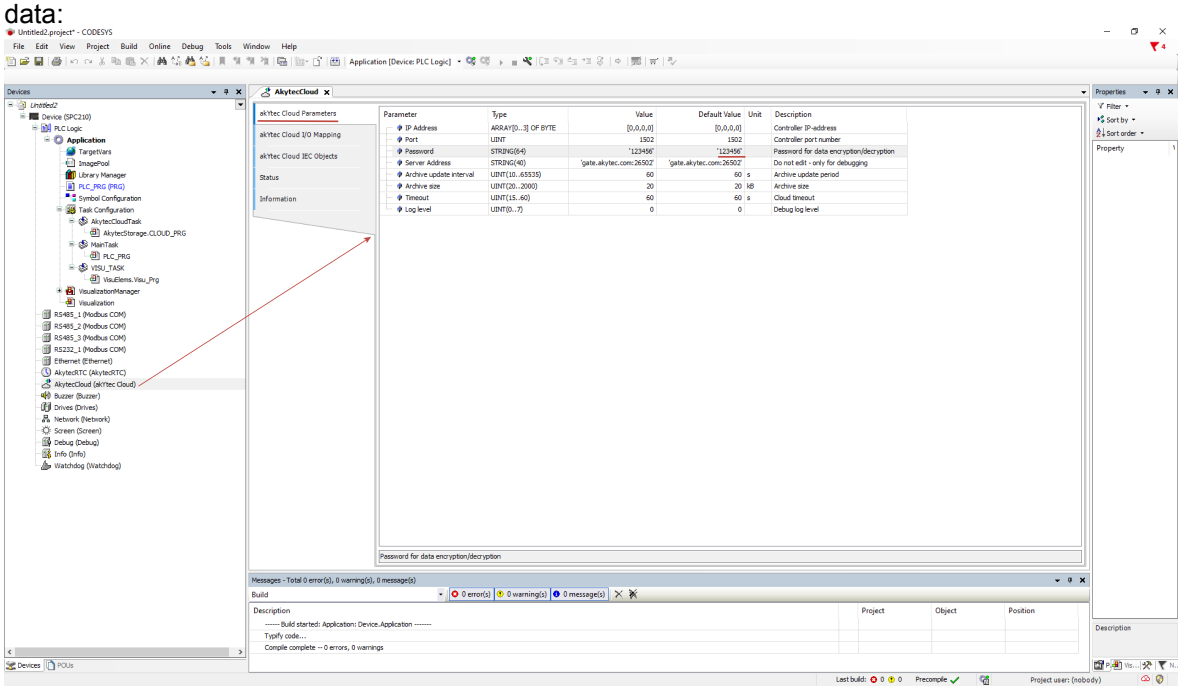
– write only

– read and write.



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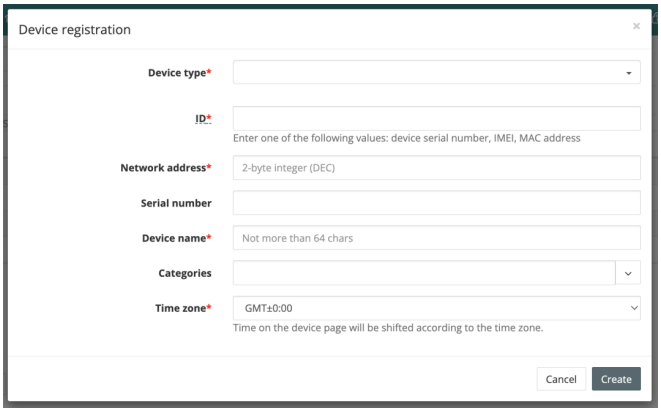
In the **akYtec Cloud / akYtec Cloud Parameters** node, enter a password to encrypt the transmitted data:



This password is used when adding the device to akYtec Cloud.
Connect to the controller and upload the project to the controller.

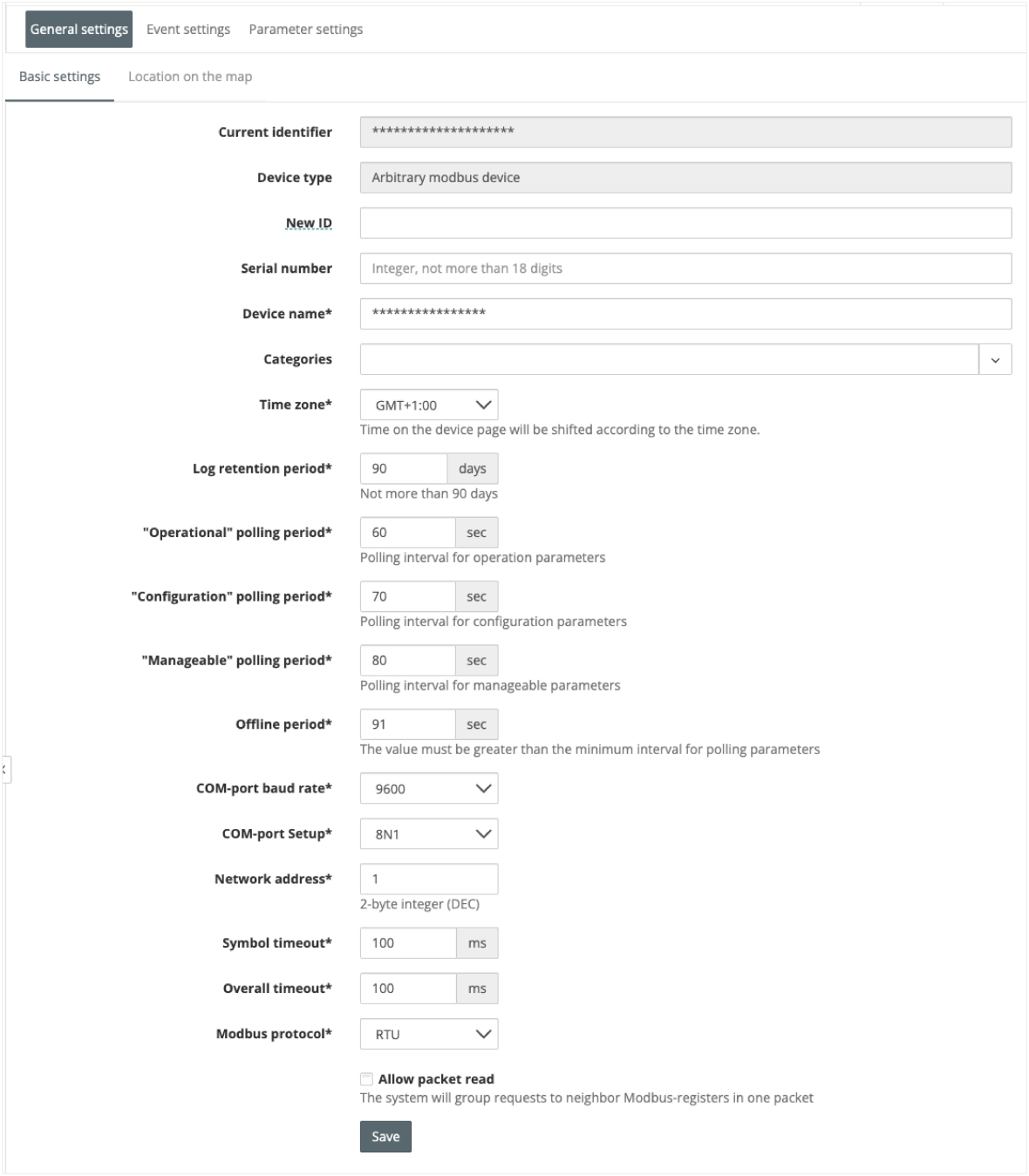
Adding the device to akYtec Cloud

Open your browser and navigate to *https://cloud.akytec.de/*, then log in. The main akYtec Cloud window will appear.
In the **Administration** section, open the **Devices** tab and click the **Add device** button. A window will appear:



Device type – select the device to be connected;
ID – enter the device serial number (indicated on the device enclosure and in the Info node of the target file in the SERIAL channel. You need to bind a STRING type variable to the channel.)
Device name – enter the device name;
Categories – select the groups to which the device will belong
Time zone – select the time zone in which the device is located.
Click the **Create** button.
In the device settings, select **Basic Settings / General Settings**. A window will appear:

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Password – enter the password specified in the Codesys 3.5 project.

Adding device parameters to akYtec Cloud

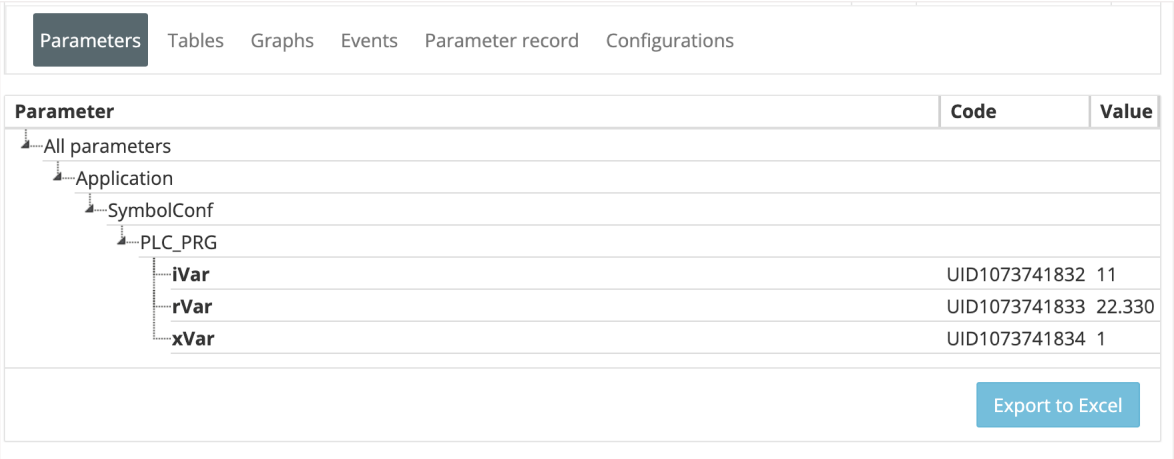
The list of controller variables will be automatically uploaded to akYtec Cloud, which may take a few minutes.

Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . The main akYtec Cloud window with the **Parameters** tab will appear.
Change the values of the variables in CODESYS 3.5 and monitor the corresponding changes in akYtec Cloud.

When the communication status  appears, refresh the page by pressing F5.
To verify that the parameter values have been recorded to the device, click the **Write commands** tab.

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CAUTION
To enable verification, the list must include parameters of the **manageable** type.

Restrictions:

– The number of valid controller parameters imported into akYtec Cloud is limited to 1000. If this limit is exceeded, some parameters will not be imported from the controller, and the **Symbol error** channel on the **I/O Mapping** tab in the **akYtec Cloud** node in Codesys 3.5 will be set to **TRUE**.
– The number of folders in the configuration is limited to 100. If this limit is exceeded, parameters from some folders will not be imported from the program in the controller, and the **Folder error** channel on the **I/O Mapping** tab in the **akYtec Cloud** node in Codesys 3.5 will be set to **TRUE**.
– Only elementary data types (except STRING, WSTRING, DT, DATE, TOD, TIME, LTIME) are supported for import.
– To connect to **akYtec Cloud**, the correct network settings (in particular, the gateway address and DNS server addresses) must be configured in the controller.

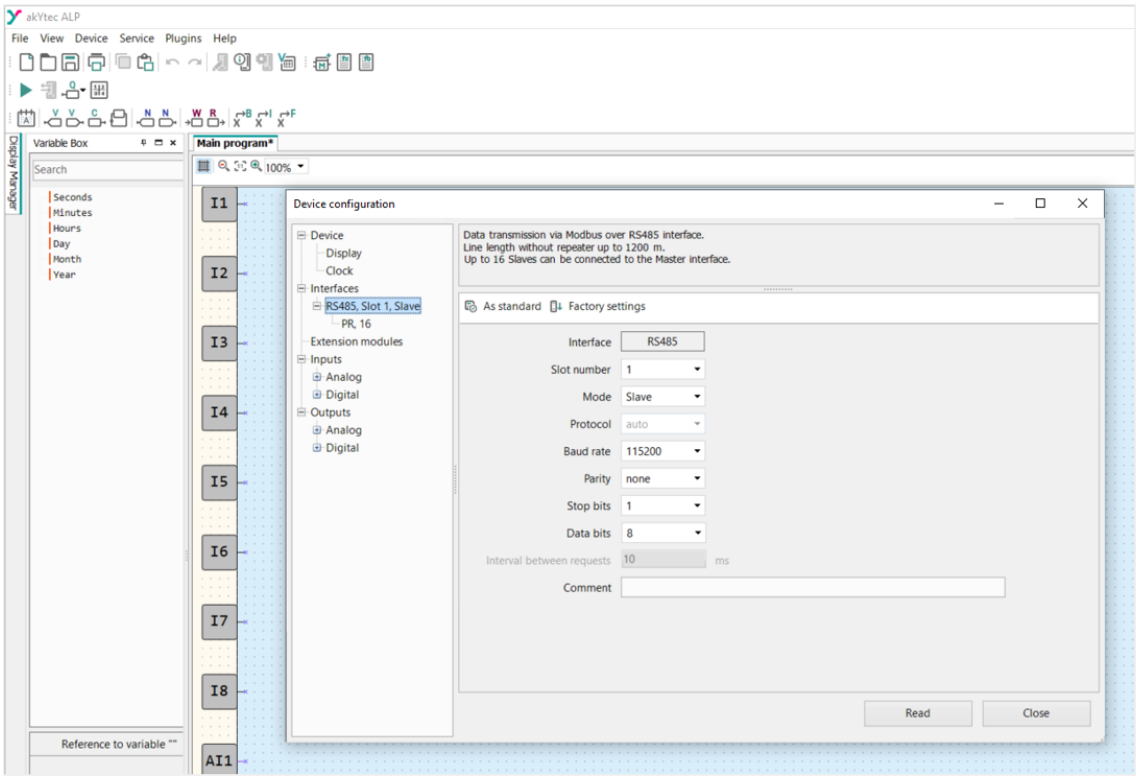
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19 Programmable relay connection

Connection of PR200 programmable relays with the RS485 interface.

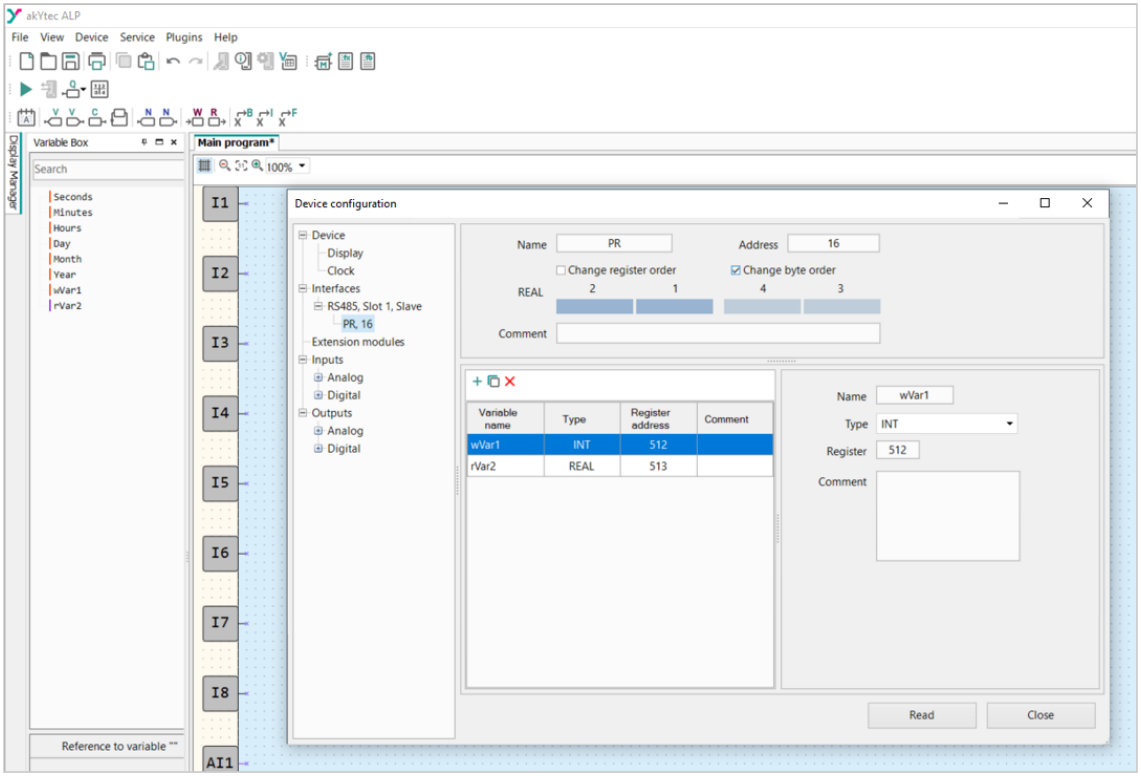
Project creation and device setup in ALP

1. Set the device network settings:
   - Slot number: 1 (the slot number depends on the RS485 slot used)
   - Mode: Slave
   - Baud rate: 115200 bps
   - Parity: None
   - Stop bits: 1
   - Data bits: 8.



2. Add the following network variables to the register map:

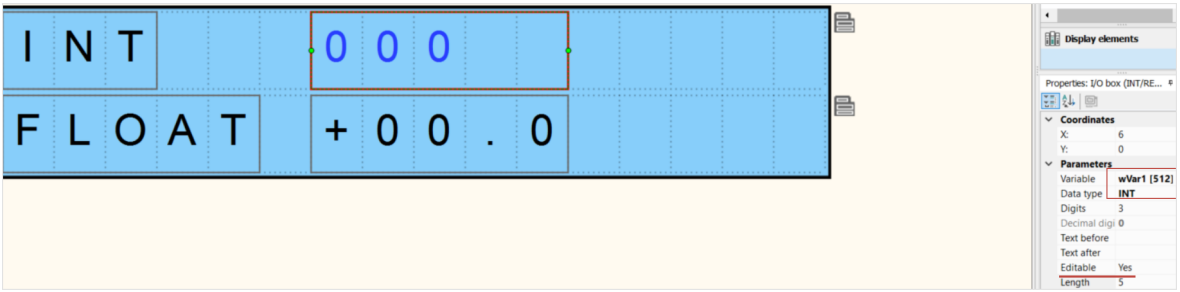
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Variable name	Type	Register address	Description
wVar	Integer	512	Integer value
rVar	With floating point	513–514	Floating point value

CAUTION
The floating-point variable (rVar) occupies two registers in the PR200 memory (in this case, registers 513 and 514).

3. Create a visualization screen.
4. Add the **Int** input/output and **Float** input/output items to the visualization screen.
5. Assign the variables wVar (Int) and rVar (Float) to the corresponding items.

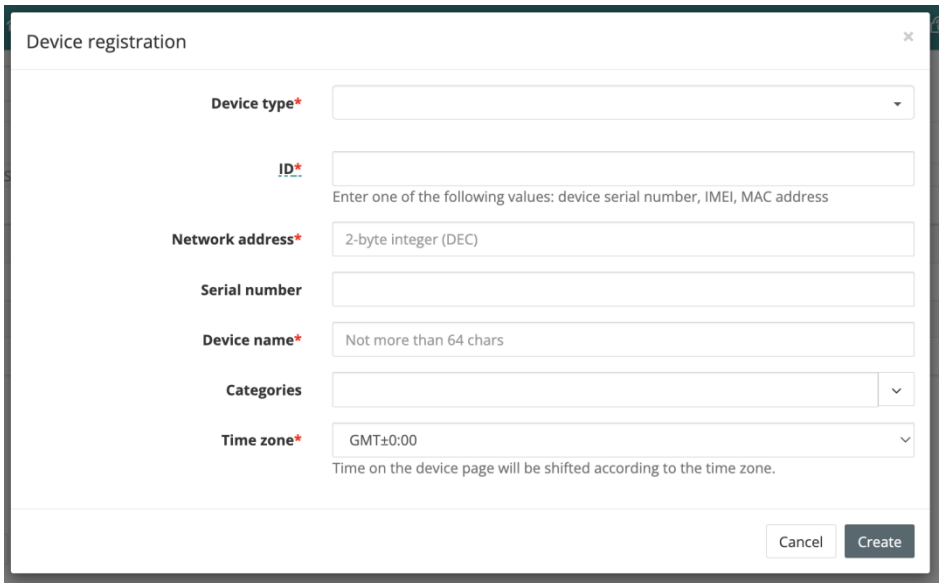


To change parameter values from the PR200 display, set the **Editeable** parameter to **Yes**.

Adding a device and gateway to akYtec Cloud

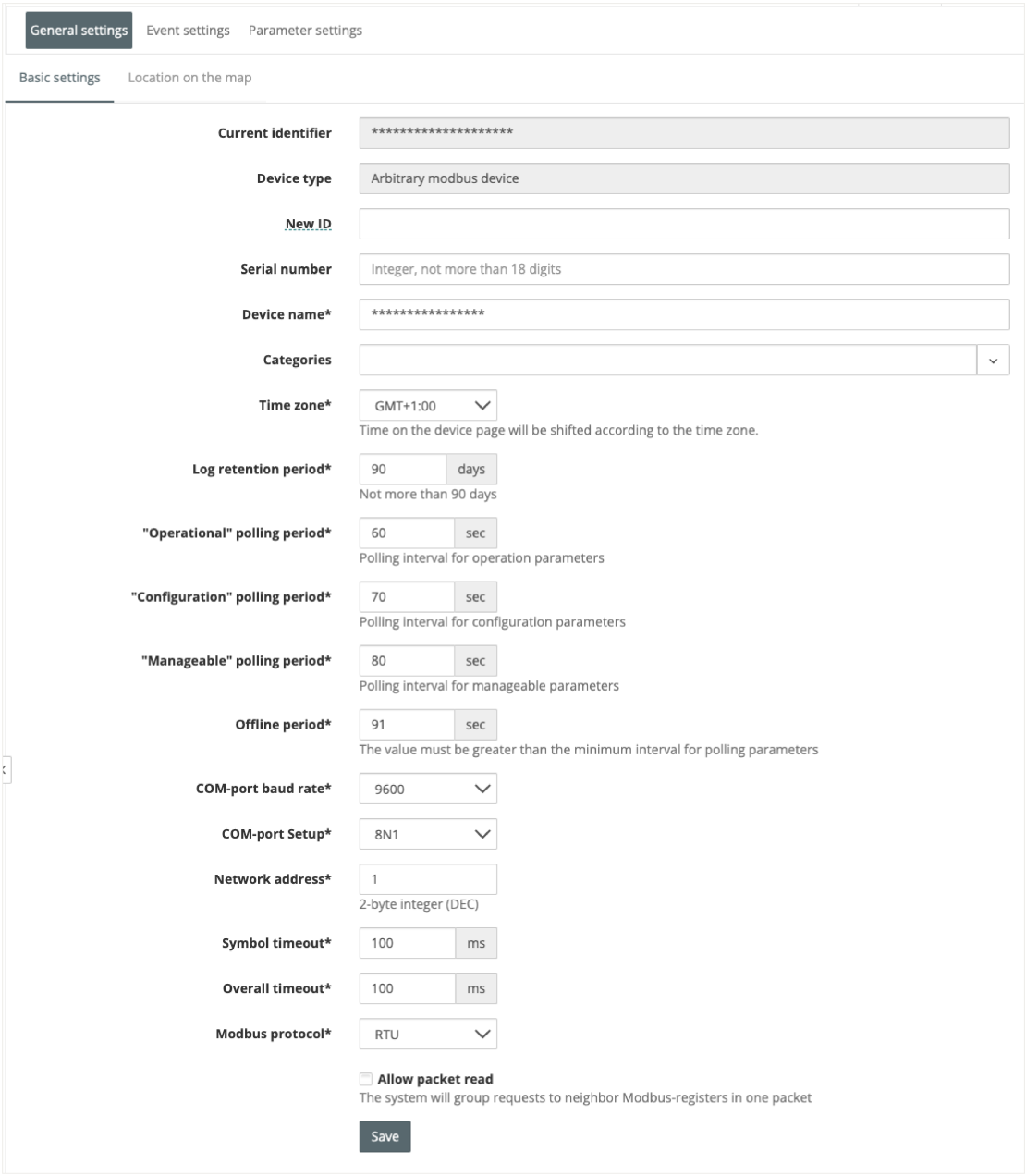
Open your browser and navigate to *https://cloud.akytec.de/*, then log in. The main akYtec Cloud window will appear.
In the **Administration** section, open the **Devices** tab and click the Add device button. A window will appear:

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Device type – select the device to be connected.
ID – enter the gateway serial number (indicated on the gateway enclosure).
Network address – enter “16”.
Serial number – enter the device serial number.
Device name – enter the device name.
Categories – select the groups to which the device will belong.
Time zone – select the time zone in which the device is located.
Click the **Create** button.
in the device settings, select **Basic settings / General setting**. A window will appear:

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– **COM-port baud rate** – set the COM port speed
– **COM-port Setup** – select the COM port settings, in the following format:
  – Number of information bits per byte of data. Possible options: 7, 8.
  – Parity mode. Possible options: N - none, E - even, O - odd.
  – Stop bits. Possible options: 1, 2.

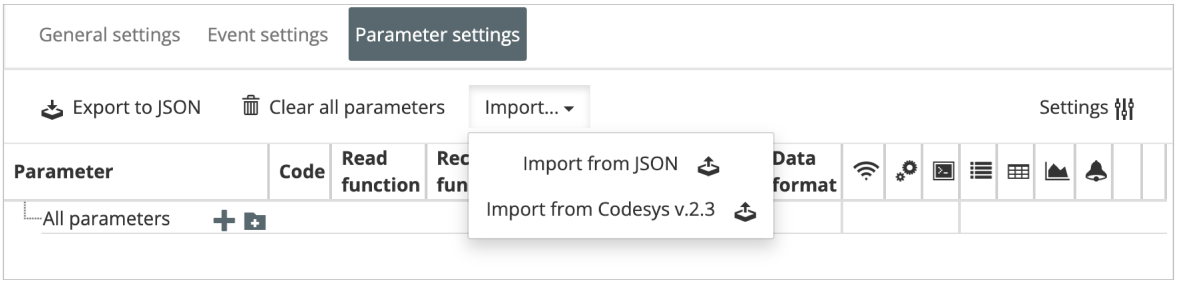
Example:
8N1 – 8 data bits, no parity, 1 stop bit.

Click the **Save** button.

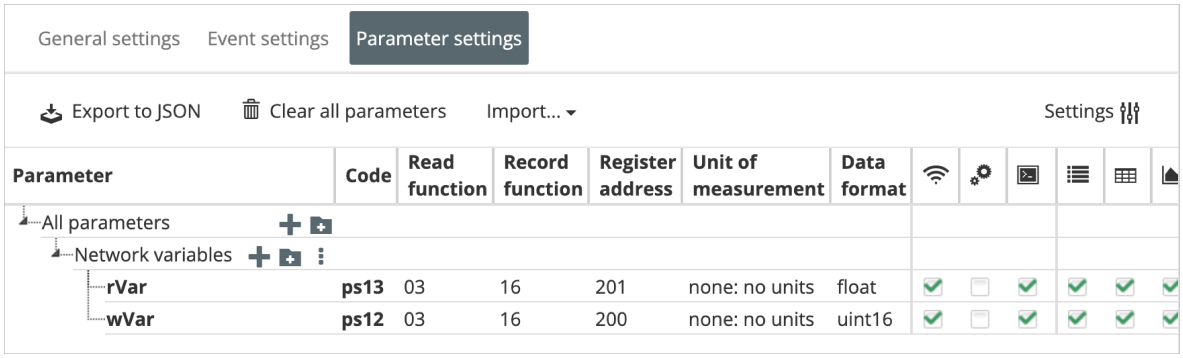
Adding device parameters to akYtec Cloud

Import the parameter file created in the ALP environment by selecting **Parameter settings / Import / Load from JSON**.

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This will automatically add the PR200 parameters to akYtec Cloud:



Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . The main akYtec Cloud window with the **Parameters** tab will appear.
Change the variable values from the PR200 display and monitor the corresponding changes in akYtec Cloud.
To verify that the parameter values have been recorded to the device, click the **Write commands** tab.



CAUTION
To enable verification, the list must include parameters of the **manageable** type.

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