



**akYec Cloud**

**Cloud Service**

**User guide**

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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.

akYtec Cloud functions:

- 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 ready-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.

## 1.2 Terms and abbreviations

**API**— a software interface that allows akYtec Cloud to be integrated with other information systems

**Acceptance of the offer** — acceptance of the terms and conditions of the offer by registering in 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 define their experience in akYtec Cloud

**Gx24** – network gateways GG-24–, GE-24–, GW-24–Cloud


## 2 Quick start

1. Sign up in 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 way.
7. If necessary, customize the facility events.
8. Add advanced features:
  - visualization of the facility operation using simple mnemonic diagrams;
  - user-defined custom graphs for comparing data from different devices or similar parameters;
  - a consolidated report to analyze the operation of the facility for the period;
  - program the automation logic for controlling the facility in Pascal;
9. Add new users and assign roles and rights to access to facilities.

akYtec Cloud team thanks you for choosing our service and hopes that using it will be easy and smooth for you.

### 3 Sign up

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

Log in  English

Email

Password

Log in

Remember me

[Forgot password?](#) | [Sign up](#) | [Demo login](#)

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. The main akYTEC Cloud window will open.

### 4 Legal entities

#### 4.1 General information

You can get the legal entity status:

- when you sign up for the akYtec Cloud service;
- by changing an individual's account to a legal entity. If you want to change your account type (Individual -> Legal entity), please contact our support team at [info@akytec.de](mailto:info@akytec.de).

Services for legal entities are provided on the basis of a unilateral offer.

#### 4.2 Legal entity sign up



## 4 Legal entities

---

1. Fill out the credentials.

**CAUTION**

Company credentials can only be changed by contacting technical support at [info@akyttec.de](mailto:info@akyttec.de).

2. Read the offer and privacy policy and check the appropriate box if you agree.
3. Click the **Sign up** button. An e-mail will be sent to the specified e-mail address to confirm your sign up.
4. Open the e-mail you received and click on the link to confirm your sign up. The akYtec Cloud window will open and a message **Your sign up has been confirmed**

**CAUTION**

If you have not received an e-mail to confirm your registration, please contact Technical Support at [info@akyttec.de](mailto:info@akyttec.de).

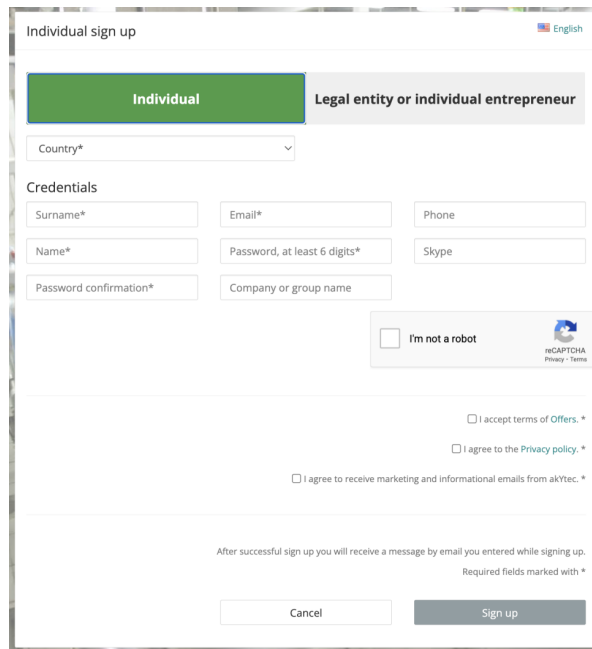
5. Log in to akYtec Cloud.

### 4.3 Offer agreement

The akYtec Cloud service is provided under a unilateral offer.

### 5 Individuals

#### 5.1 Individual sign up



The screenshot shows a web form titled "Individual sign up" with a language selector set to "English". There are two tabs: "Individual" (selected) and "Legal entity or individual entrepreneur". The form includes a "Country\*" dropdown menu. Under the "Credentials" section, there are input fields for "Surname\*", "Email\*", "Phone", "Name\*", "Password, at least 6 digits\*", "Skype", "Password confirmation\*", and "Company or group name". A CAPTCHA section contains an "I'm not a robot" checkbox and a RECAPTCHA logo with links for "Privacy" and "Terms". Below the form are three checkboxes: "I accept terms of Offers.", "I agree to the Privacy policy.", and "I agree to receive marketing and informational emails from akYtec.". A note states: "After successful sign up you will receive a message by email you entered while signing up. Required fields marked with \*". At the bottom are "Cancel" and "Sign up" buttons.

1. Fill out the credentials.
2. Read the offer and privacy policy and check the appropriate box if you agree.
3. Click the **Sign up** button. An e-mail will be sent to the specified e-mail address to confirm your sign up.
4. Open the e-mail you received and click on the link to confirm your sign up. The akYtec Cloud window will open and a message **Your sign up has been confirmed**.
5. Log in to akYtec Cloud.

#### 5.2 Offer agreement

The akYtec Cloud service is provided under a unilateral offer.

## 6 Rights and roles

There are two types of users in the akYtec Cloud service:

- Administrator, can add users and has access to the capabilities of all other roles;
- User with the rights restricted to:
  - access to the device group;
  - access to actions (roles).

Rights and roles are set when adding / modifying a user account.

Role	Role enabled (available options)	Role disabled (available options)
<b>Administrator</b>	<ul style="list-style-type: none"> <li>– <b>add users</b>;</li> <li>– all the capabilities available to the other roles</li> </ul>	Options according to the chosen roles
<b>Profile Manager</b>	Full access to your company profile: <ul style="list-style-type: none"> <li>– view;</li> <li>– editing the company profile</li> </ul>	Restricted access to company profile: <ul style="list-style-type: none"> <li>– view the company profile</li> </ul>
<b>Category Manager</b>	Full access to groups: <ul style="list-style-type: none"> <li>– create;</li> <li>– rename;</li> <li>– move groups and subgroups;</li> <li>– organize devices, mnemonic diagrams, templates, graphs, reports, programs, desktops into groups (if there is access to devices);</li> <li>– delete</li> </ul>	Restricted access to groups: <ul style="list-style-type: none"> <li>– view groups;</li> <li>– distribute devices, mnemonic diagrams, templates, graphs, reports, programs, desktops to groups (if there is access to devices)</li> </ul>
<b>Device Manager</b>	Full access to the company's devices: <ul style="list-style-type: none"> <li>– <u>add</u>;</li> <li>– <u>set up devices</u>.</li> </ul>	Restricted access to the company's devices: <ul style="list-style-type: none"> <li>– view data and events in a device;</li> <li>– organize devices into groups</li> </ul>
<b>Mnemonic Diagram Manager</b>	Full access to <u>mnemonic diagrams</u> : <ul style="list-style-type: none"> <li>– <u>view</u>;</li> <li>– <u>add</u>;</li> <li>– edit;</li> <li>– delete mnemonic diagrams</li> </ul>	Restricted access to mnemonic diagrams: <ul style="list-style-type: none"> <li>– <u>view</u>;</li> <li>– start templates on mnemonic diagrams if the <b>Command Manager</b> role is enabled</li> </ul>
<b>Graph Manager</b>	Full access to <u>custom graphs</u> : <ul style="list-style-type: none"> <li>– view custom <u>graphs and trends</u>;</li> <li>– <u>add</u>, edit, delete custom graphs of the company</li> </ul>	Restricted access to <u>custom graphs</u> : <ul style="list-style-type: none"> <li>– view custom <u>graphs and trends</u>;</li> </ul>
<b>Report Manager</b>	Access to the <u>consolidated report</u> : <ul style="list-style-type: none"> <li>– <u>view</u>;</li> <li>– <u>add</u>;</li> <li>– delete the consolidated report</li> </ul>	Restricted access to the <u>consolidated report</u> : <ul style="list-style-type: none"> <li>– <u>view</u></li> </ul>
<b>Program Manager</b>	Full access to <u>custom programs</u> : <ul style="list-style-type: none"> <li>– <u>view</u> ;</li> <li>– <u>create and compile</u> ;</li> <li>– <u>start and stop</u> ;</li> <li>– delete custom programs</li> </ul>	No access

<b>Desktop Manager</b>	Full access to <u>desktops</u> : <ul style="list-style-type: none"> <li>– <u>view</u>;</li> <li>– <u>add</u>;</li> <li>– edit;</li> <li>– delete</li> </ul>	Restricted access to <u>desktops</u> : <ul style="list-style-type: none"> <li>– <u>view</u>;</li> <li>– start templates if the <b>Command Manager</b> role is enabled;</li> <li>– view trends</li> </ul>
<b>Event Manager</b>	Full access to <u>events</u> : <ul style="list-style-type: none"> <li>– view the <u>device events</u> and <u>facility events</u> list;</li> <li>– set up <u>device events</u> or <u>facility events</u> ;</li> <li>– edit;</li> <li>– delete</li> </ul>	Restricted access to events: <ul style="list-style-type: none"> <li>– view the <u>device events</u> and <u>facility events</u> list;</li> </ul>
<b>Command Manager</b>	Full access to templates: <ul style="list-style-type: none"> <li>– <u>create</u>;</li> <li>– <u>start templates</u> and start templates on mnemonic diagrams, run templates on desktops;</li> <li>– delete</li> </ul>	No access
<b>Configuration Manager</b>	Access to device configurations: <ul style="list-style-type: none"> <li>– record a set of controlled parameters (<u>configurations</u>) to the device</li> </ul>	No access
<b>Own Settings Manager</b>	Full access to your profile: <ul style="list-style-type: none"> <li>– change account data</li> </ul>	Restricted access to your profile: <ul style="list-style-type: none"> <li>– view account data</li> </ul>

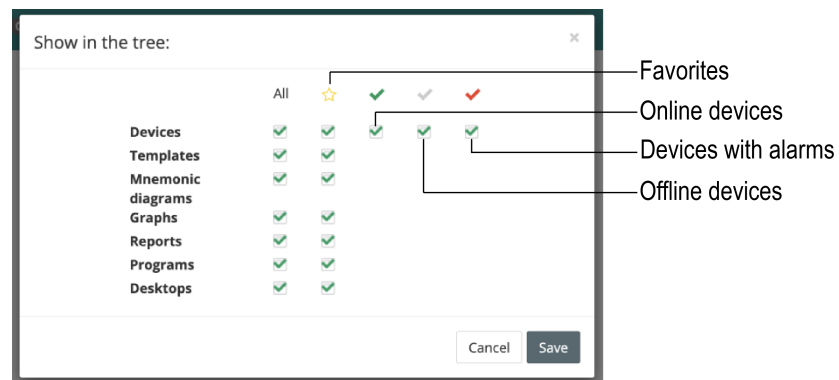
## 7 Navigating the interface

### 7 Navigating the interface

akYtec Cloud main window:



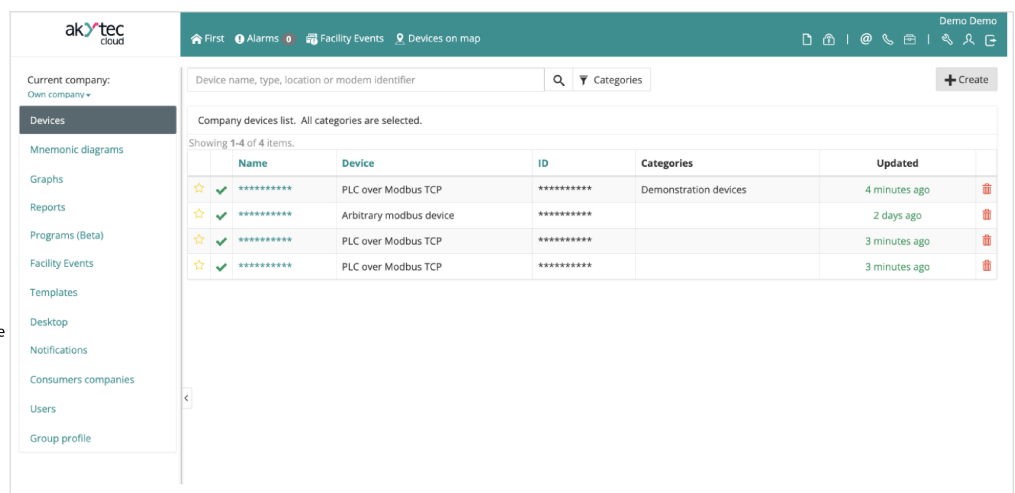
Setup for tree displaying:



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



## 8 Add and set up devices

### 8 Add and set up devices

#### 8.1 Adding a device

Devices are added in akYTEC Cloud and set up depending on:

- device type;
- connection interface (RS485 or Ethernet).

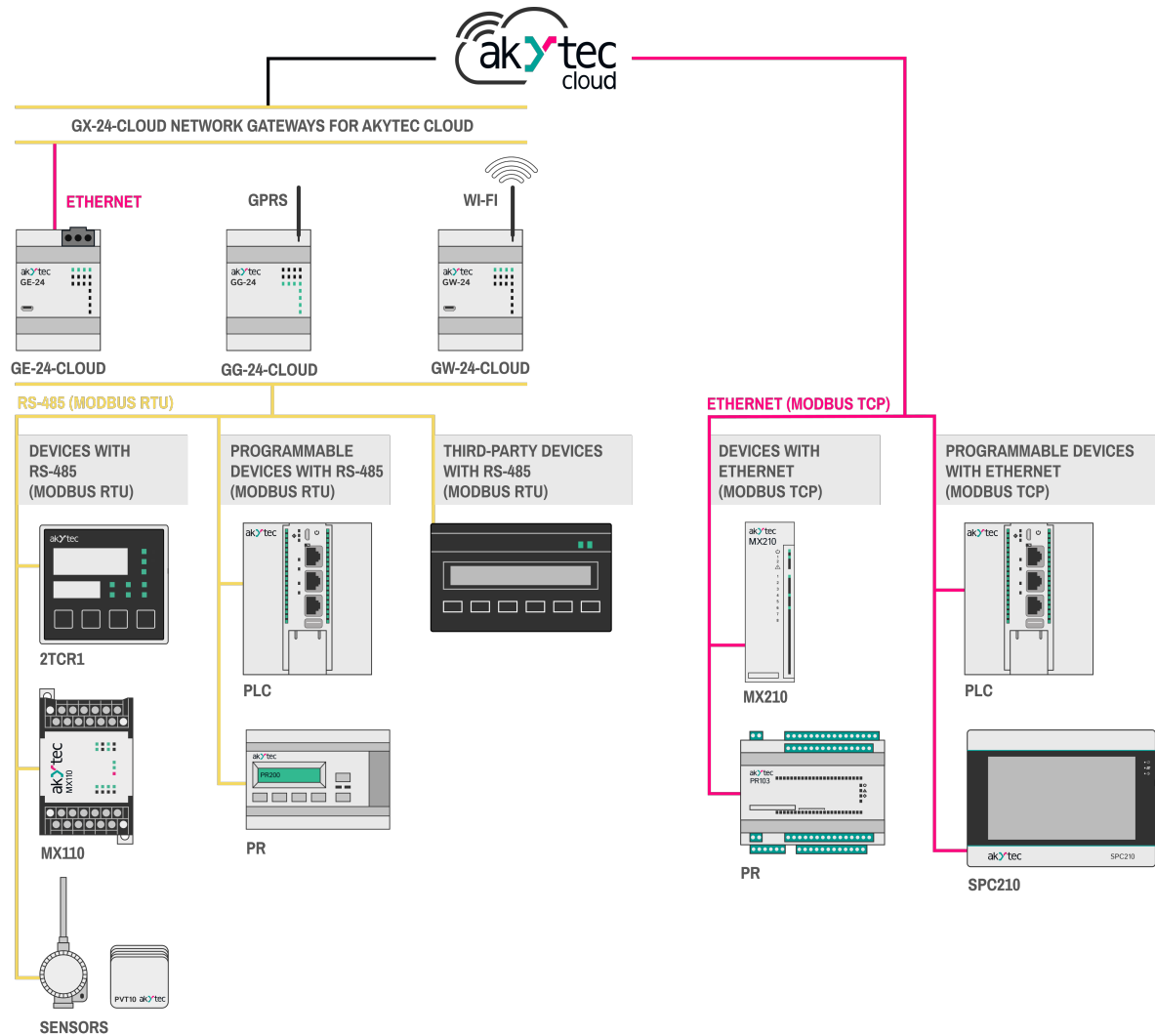


Table 8.1 Devices

Device	Connection	Connection and configuration
<b>Programmable logic controllers (PLC, SPC)</b>		
PLC210, SPC210	<device name> via Ethernet - Container	<u>Connection via Ethernet</u>
<b>Programmable compact controller</b>		
SMI200	<device name> via RS485 - via gateway	<u>Connection via RS485 (via gateway)</u>
<b>Programmable relays</b>		

## 8 Add and set up devices

PR103,	<device name> - MODBUS protocol	<u>Connection via RS485 (via gateway)</u>
	<device name> via Ethernet - Container	<u>Connection via Ethernet</u>
PR200, PR102, PR100	<device name> via RS485 - via gateway	<u>Programmable relay connection</u>
<b>Input and output modules (Mx)</b>		
MV210, MU210, MK210, ME210	<device name> - MODBUS protocol	<u>Connection via RS485 (via gateway)</u>
	<device name> via Ethernet - Container	<u>Connection via Ethernet</u>
MV110, MU110, MK110, ME110	<device name> via RS485 - via gateway	<u>Connection via RS485 (via gateway)</u>

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

**Device type** – select the name 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 open:

**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 open:

Basic settings
Events settings
Parameters settings

General settings
Map location

**Current identifier**

**Device type**

**New ID**

**Device name\***

**Categories**  ▼

**Time zone\***  ▼  
Time on the device page will be shifted according to the time zone.

**Log retention period\***    
Not more than 90 days

**"Operative" period\***    
Operative parameters gathering interval

**"Configuration" period\***    
Configuration parameters gathering interval

**"Manageable" period\***    
Manageable parameters gathering interval

**Offline period\***    
Value must be greater than minimal parameters gathering interval

**Serial Speed\***  ▼

**Serial Setup\***  ▼

**Network address\***   
2-byte integer (DEC)

**Symbol timeout\***

**Overall timeout\***

**Modbus protocol\***  ▼

**Allow packet read**  
The system will group requests to neighbor Modbus-registers in one packet

Save

**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;



## 8 Add and set up devices

– MAC address for 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 setting** in the device settings. A window will open:

<b>Device name*</b>	<input type="text" value="*****"/>
<b>Categories</b>	<input type="text"/> <span>▼</span>
<b>Time zone*</b>	<input type="text" value="GMT+1:00"/> <span>▼</span> <small>Time on the device page will be shifted according to the time zone.</small>
<b>Log retention period*</b>	<input type="text" value="90"/> <input type="text" value="days"/> <small>Not more than 90 days</small>
<b>"Operative" period*</b>	<input type="text" value="60"/> <input type="text" value="sec"/> <small>Operative parameters gathering interval</small>
<b>"Configuration" period*</b>	<input type="text" value="70"/> <input type="text" value="sec"/> <small>Configuration parameters gathering interval</small>
<b>"Manageable" period*</b>	<input type="text" value="80"/> <input type="text" value="sec"/> <small>Manageable parameters gathering interval</small>
<b>Offline period*</b>	<input type="text" value="90"/> <input type="text" value="sec"/> <small>Value must be greater than minimal parameters gathering interval</small>

**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 in which the device is located. Reports relative to this time zone will take into account the time parameters.

**Log retention period** – enter the retention time of data from the device. The maximum value is 90 days. The log retention period defines the retention time of each new record, i.e. the time after which the record will be automatically deleted from the database. When the value of a parameter is changed, the new value applies only to the new events

**"Operative" period** – set the polling period of operative parameters (see [Setting the device parameter types](#)).

**"Configuration" period** – set the polling period of configuration parameters (see [Setting the device parameter types](#)).

**"Manageable" period** – set the polling period of 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 Add and set up devices

### 8.3.1.1 RS485 interface and protocol settings

Serial Speed*	9600	▼
Serial Setup*	8N1	▼
Network address*	1	2-byte integer (DEC)
Symbol timeout*	100	ms
Overall timeout*	100	ms
Modbus protocol*	RTU	▼
<input type="checkbox"/> <b>Allow packet read</b> The system will group requests to neighbor Modbus-registers in one packet		

**Network address** – the address of the device connected to the Gx–24 gateway.

**Serial speed** – set the COM port speed of the device connected to the Gx–24 network gateway.

**Serial setup** – select the COM port settings set in the device connected to the Gx–24 gateway:

- the number of information bits for one byte of data (data bits). 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 (check in the device user guide)).

### 8.3.1.2 Ethernet devices

Current identifier	*****
Device type	ME210 over Ethernet - Manual setting
<u>New ID</u>	
Password	Password
<b>Device name*</b>	device_name

**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 device settings in akYtec Cloud:

- **operative** – parameters whose values change frequently and need to be monitored promptly;
- **manageable** – parameters to be written to the device: parameter recording, template recording, configurations;

## 8 Add and set up devices

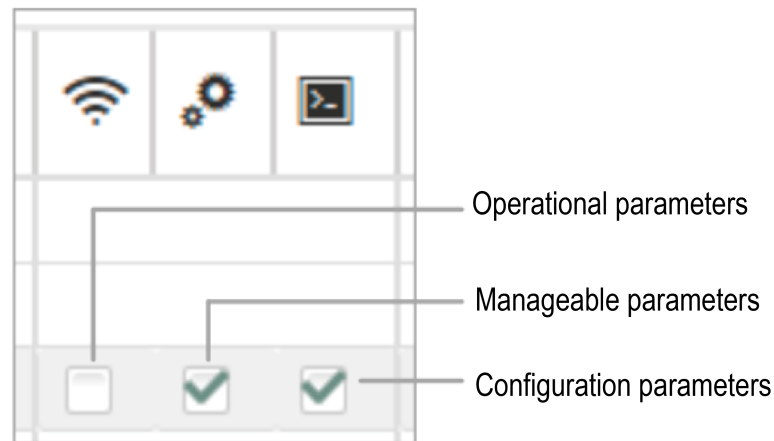
- **configuration** – parameters that are displayed on the **Configuration** tab. It is convenient to use it, for example, for recipes, when you want to change several parameters to predefined values at once.

Each parameter type has its own *polling period*.

Open the **Parameter settings** tab in the device settings. A window will open:

Basic settings   Events settings <b>Parameters settings</b>															
<a href="#">Export to JSON</a> <a href="#">Clear all parameters</a> <a href="#">Import from file</a>							Settings								
Parameter	Code	Read function	Write function	Register address	Unit of measurement	Data format									
- All parameters <span style="float: right;">+ </span>															
Charge	h1	03	non writable	F9	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Temperature	h2	03	16	FB	deg: °C	float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Humidity	h3	03	non writable	FD	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Check the appropriate boxes for the device parameters:



### 8.3.3 Customizing the display of parameters in reports

akYtec Cloud provides the following display settings:

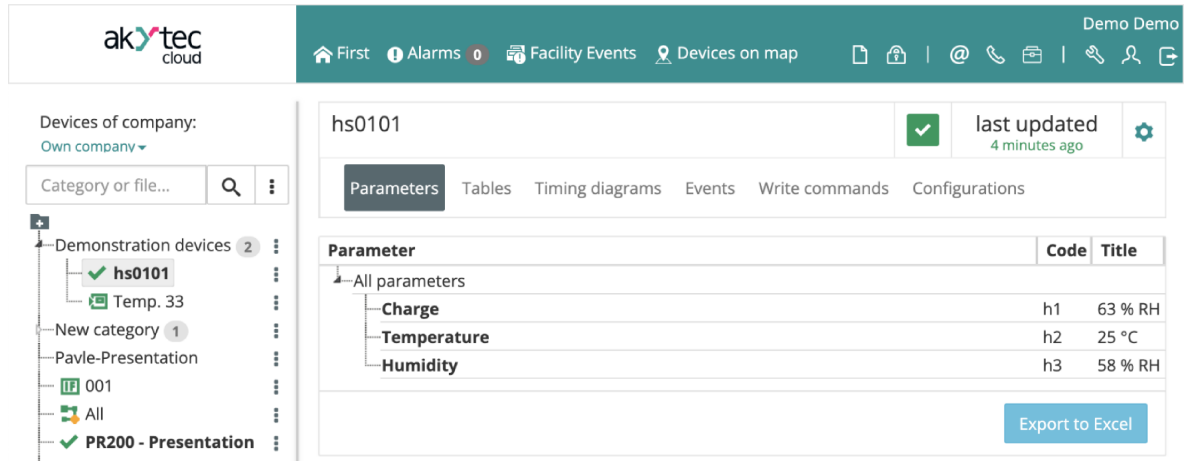
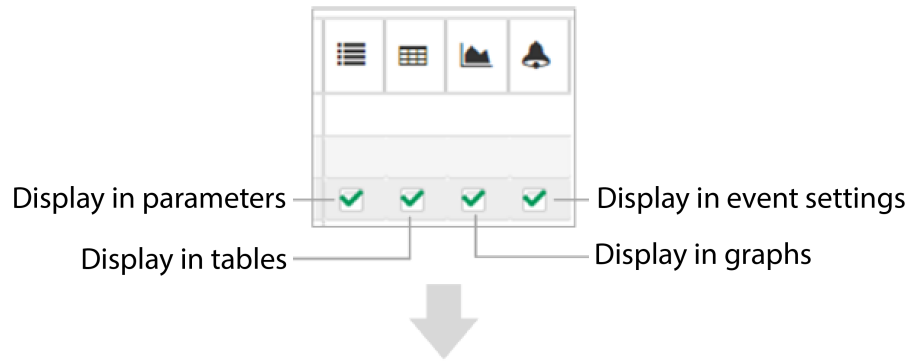
- enable/disable parameter display in reports;
- change the order in which groups and parameters are displayed.

#### Enable/disable parameter display in reports

Open the **Parameter settings** tab in the device settings. A window will open:

Basic settings   Events settings <b>Parameters settings</b>															
<a href="#">Export to JSON</a> <a href="#">Clear all parameters</a> <a href="#">Import from file</a>							Settings								
Parameter	Code	Read function	Write function	Register address	Unit of measurement	Data format									
- All parameters <span style="float: right;">+ </span>															
Charge	h1	03	non writable	F9	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Temperature	h2	03	16	FB	deg: °C	float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Humidity	h3	03	non writable	FD	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

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



**Change the order in which parameters are displayed**


By default, the parameter list is sorted alphabetically. It is possible to customize the order of parameters to be displayed in akYtec Cloud.

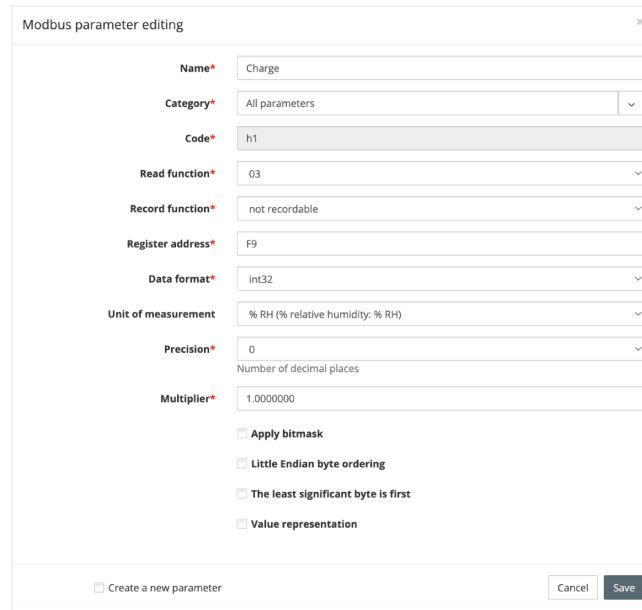
Open the **Parameter settings** tab in the device settings. Move the parameter using drag-and-drop or the arrows.

Parameter	Code	Unit	Address	Writeable	Protocol	Format	Resolution	Display in parameters	Display in tables	Display in graphs	Display in event settings
Charge	h1	03	non writable	F9	% RH: % RH	int32		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature	h2	03	16	FB	deg: °C	float		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Humidity	h3	03	non writable	FD	% RH: % RH	int32		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**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 open:



**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. "A"- "Z", "a"- "z", ".", "/", "-", "\_" characters are supported.

**Read function** – Modbus read function. Possible values:

- not 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:

- not recordable - 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.

**Storage format** – the data format.

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)

## 8 Add and set up devices

**Unit of measurement** – the unit of measurement of the parameter, which will be 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 value of a parameter 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.

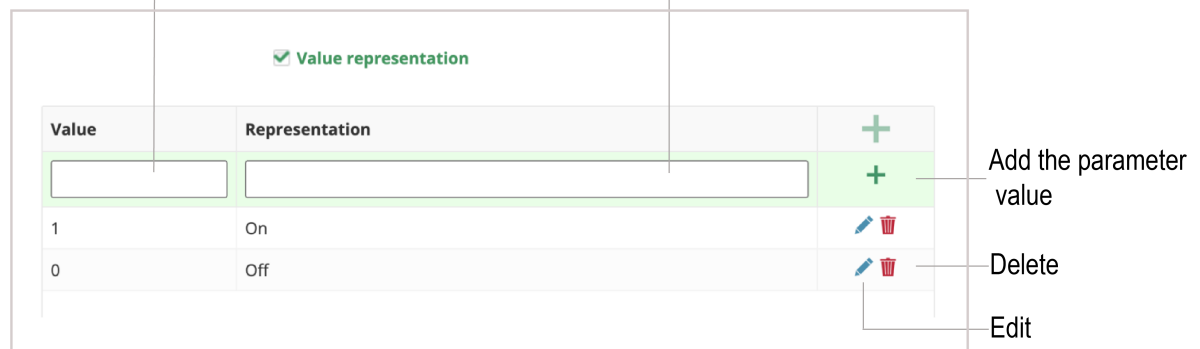
**Byte order: little endian** – check the box to use byte storage in least significant byte first order.





**Register order: little endian** – check the box to use 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.

Enter the parameter value

Enter the text information



Value	Representation	
<input type="text"/>	<input type="text"/>	+
1	On	 
0	Off	 

### 8.3.5 Setting the device map location

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

Device management: hs0101

Basic settings Events settings Parameters settings

General settings Map location

Search address

IKK gesund plus

Barbarossastraße

Barbarossastraße

Bezirkssportanlage Konrad-Adenauer-Allee

Konrad-Adenauer-Allee

Coordinates 53.078862, 8.864188

Location Barbarossastraße, Gartenstadt Vahr, Vahr, Bremen-Ost, Bremen, 28329, Germany

Save

Navigate the map to set the device location

If necessary, change the coordinates and location of the device

Specify the map location of the device and click the **Save** button.

### 8.4 Device copy

The device copying is intended for quick duplication of the same type devices. 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.

akyttec cloud

Home Alarms Facility Events Devices on map Demo Demo

Current company: Own company

Devices

Mnemonic diagrams

Graphs

Reports

Programs (Beta)

Facility Events

Templates

Desktop

Notifications

Device management: hs0101

Basic settings Events settings Parameters settings

General settings Map location

Current identifier \*\*\*\*\*

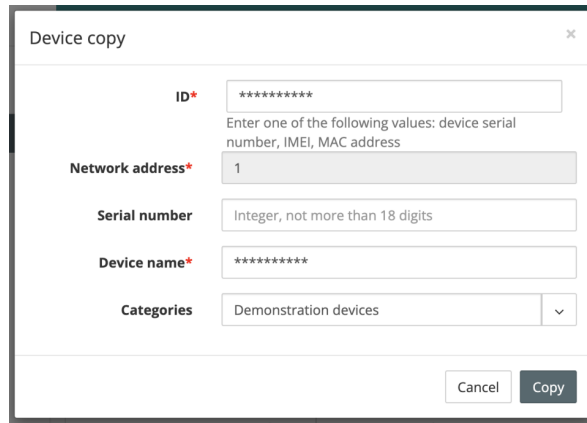
Device type PLC over Modbus TCP

New ID

Device name\* hs0101

Categories Demonstration devices

Press the device copy button. A window will open:



Device copy

**ID\*** \*\*\*\*\*  
Enter one of the following values: device serial number, IMEI, MAC address

**Network address\*** 1

**Serial number** Integer, not more than 18 digits

**Device name\*** \*\*\*\*\*

**Categories** Demonstration devices

Cancel Copy

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.



## 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 open:

Device status:

- online
- offline
- active alarm
- unread alarm

hs0101  last updated 2 minutes ago To device settings

Parameters Tables Graphs Events Parameter record Configurations Update time

Parameter	Code	Value
↳ All parameters		
↳ Charge	h1	63 % RH
↳ Temperature	h2	25 °C
↳ Humidity	h3	58 % RH

Export to Excel

Parameter values are updated automatically, the data update period is determined by the type of parameter (operational, configuration, manageable) and the polling periods set for them (see [Section 8.3.1](#)).

The list of parameters to be displayed in the report is set in the **Device parameter settings / Display in parameters** (see [Section 8.3.3](#)).

You can enable/disable the parameter code display in the [user profile](#).

If an error occurs while acquiring a parameter value, the error code is displayed. The description of error codes for the akYtec protocol is given in the **protocol description**. The description of error codes for the Modbus protocol is given in the table below.

Table 9.1 Errors generated by akYtec Cloud service

Code	Error	Description
253	NOT-A-NUMBER (NaN)	<p>Error in converting received data into float or double numbers. The main causes of the NaN error:</p> <ul style="list-style-type: none"> <li>– all non-trivial mathematical operations with NaN as one of the operands;</li> <li>– division by zero;</li> <li>– calculating the square root of a negative number;</li> <li>– logarithm of a negative number;</li> <li>– raising zero to the zero power.</li> </ul>
255	TIMEOUT	<p>No device response within the timeout period (the <b>Overall timeout</b> parameter). This code is not described in the Modbus protocol specification.</p> <p>Error code 255 occurs when there is no response from the device to a query from akYtec Cloud.</p> <p>If an error occurs for more than one parameter:</p> <ul style="list-style-type: none"> <li>– Modbus register addresses are set incorrectly for these parameters;</li> <li>– the selected Modbus functions are not supported by the device;</li> <li>– the set timeout value exceeds the response time of the device.</li> </ul> <p>If an error occurs on all parameters:</p> <ul style="list-style-type: none"> <li>– the network settings (protocol, baud rate, parity) in the akYtec Cloud service are incorrect;</li> <li>– the device address (Slave ID) is set incorrectly;</li> <li>– Modbus register addresses are set incorrectly;</li> <li>– the selected Modbus functions are not supported by the device;</li> <li>– the set timeout value exceeds the response time of the device;</li> <li>– communication line problems (D+ and D- are mixed up, cable break, cable other than twisted pair is used);</li> <li>– 120 <math>\Omega</math> terminating resistors are not installed at the ends of the line.</li> </ul>

Table 9.2 Description of error codes for Modbus protocol

Code	Error	Description
1	ILLEGAL FUNCTION	Slave device does not support the Modbus function specified in the request
2	ILLEGAL DATA ADDRESS	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 correspond to the Modbus protocol (e.g. when using the 05 Write Single Coil function, the values in the data field are different from 0x0000 and 0xFF00)
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 protects 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

### 9.2 Viewing the device data in table form

The device data in table form make it possible to view in detail the values of parameters for the device for the last 3 months, as well as to upload the values to Excel.

In the main akYTEC Cloud window, select the device and open the **Tables** tab. A window will open:

hs0101

Device status:

- online
- offline
- active alarm
- unread alarm

✔

last updated  
3 minutes ago

To device settings

Parameters
Tables
Graphs
Events
Parameter record
Configurations

Latest data
Period data

From Till

02-10-2024 00 : 00 : 00 15 ▼

Parameter Type ▼

Show

#	Date/Time	Charge (h1, % RH)	Temperature (h2, °C)	Humidity (h3, % RH)
1	02-10-2024 10:01:08	63	25	58
2	02-10-2024 10:01:02	63	25	58
3	02-10-2024 10:00:56	63	25	58
4	02-10-2024 10:00:50	63	25	58

« First
« Previous
Next »
Last »»

Export to Excel

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

Set the list of parameters to be displayed in the report in the **Device parameter settings / Display in tables** (see [Section 8.3.3](#)).

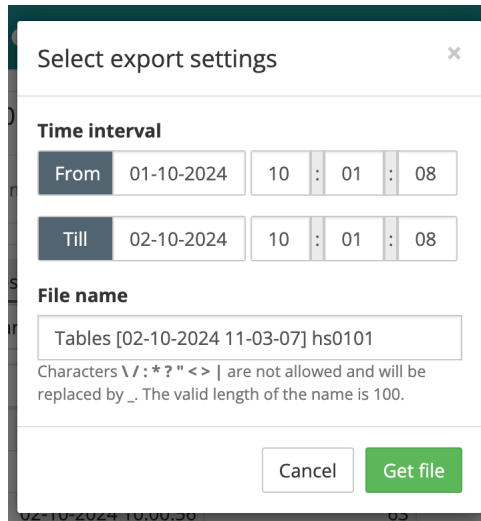
You can enable/disable the parameter code display in the [user profile](#).

If it is necessary to enable/disable visibility of a group or specific parameters, use the **Parameter Type** filter. The filter setting is saved for the user account.

Time limitation of data available for displaying 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:

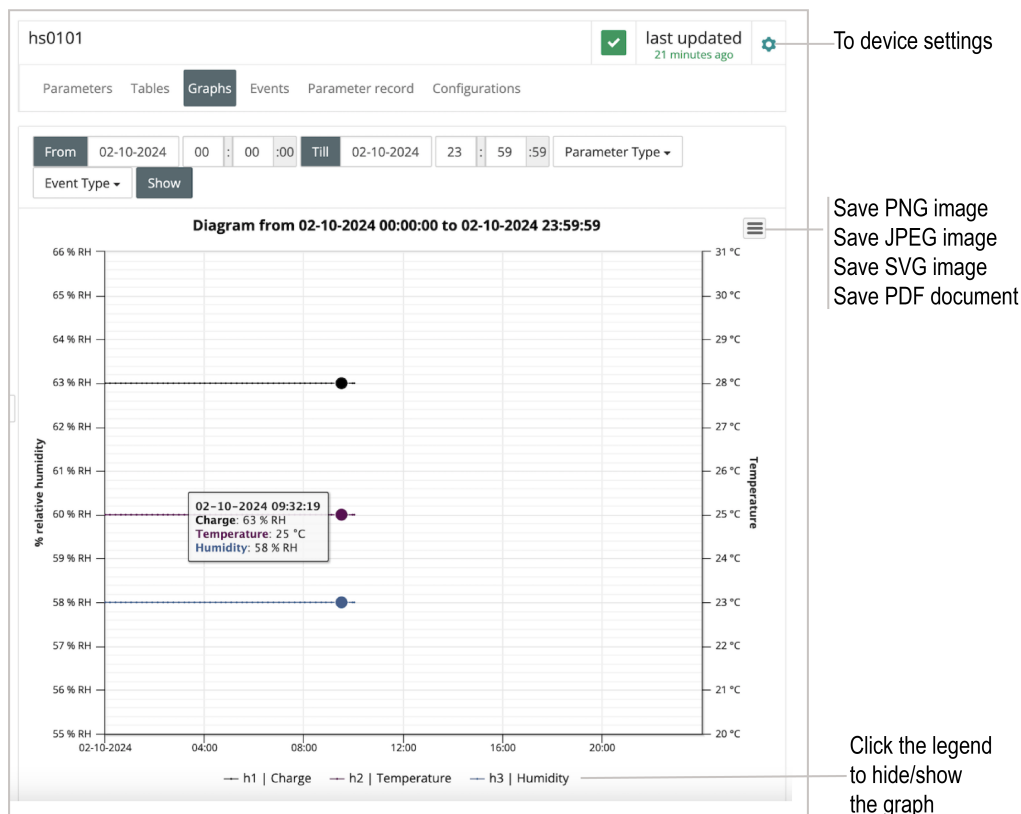
1. Click the **Export to Excel** button.
2. In the open window, select **Time interval** and specify **File name**:



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 display changes in parameter values and device events in graphical form. In the main akYtec Cloud window, select the events and open the **Graphs** tab. A window will open:



Color explanation:

- Gray vertical line - no data from the device;
- Blue vertical line - event start and end;
- Red vertical line – alarm start.

Specify the time interval of the data to be displayed in the report by setting the appropriate values in the **From** and **Till** fields. Click the **Show** button.

If necessary, zoom in on the graph. Highlight the part of the graph you want to zoom in on by holding down the left mouse button.

## 9 Monitoring and analysis

Set the list of parameters to be displayed in the report in the **Device parameter settings/Display on graphs** (see [Section 8.3.3](#)).

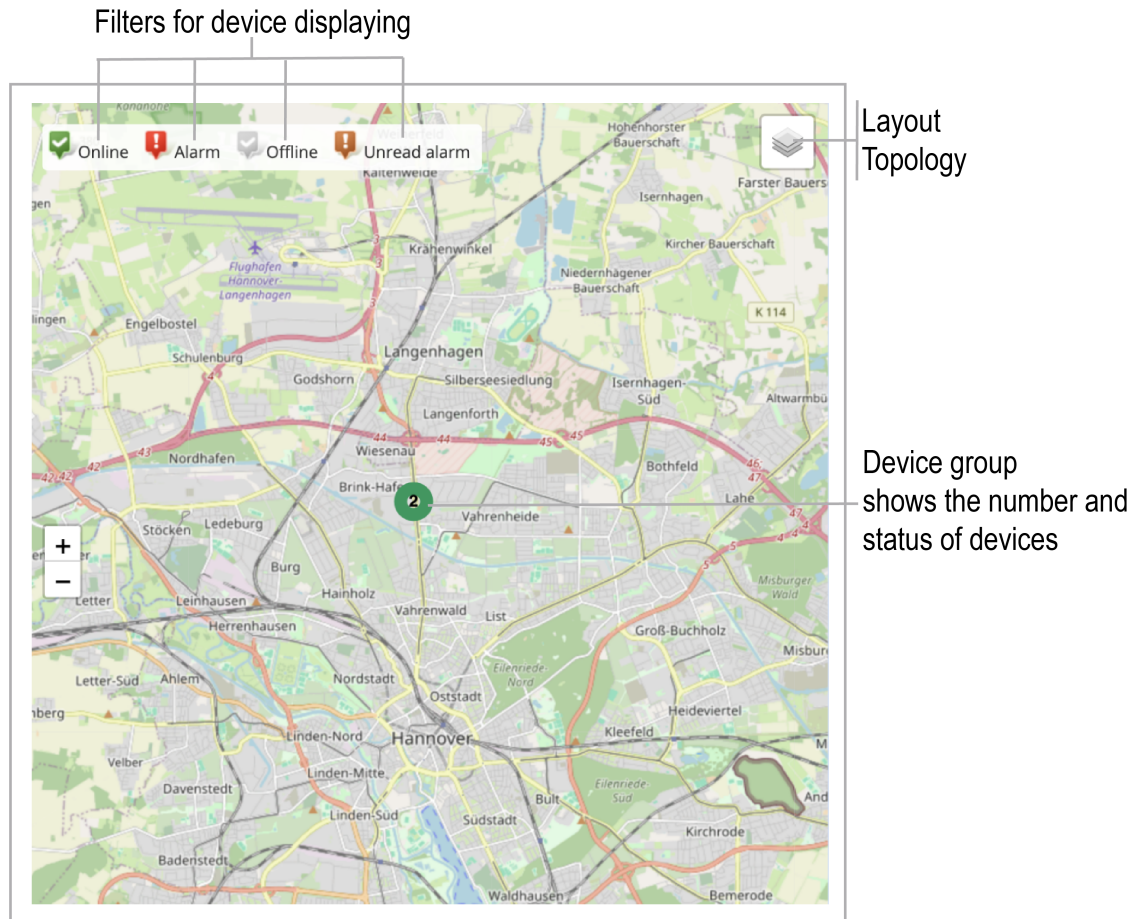
You can enable/disable the parameter code display in the [user profile](#).

If you want to enable or disable the visibility of parameters and events, use the **Parameter type** and **Event type** filters. The filter settings are saved for the user account. The filter settings are saved for the user account.

### 9.4 Viewing the device map location

The map displays the location and status of account devices directly connected to akYtec Cloud. For the devices connected via the Gx-24 gateway, only the gateway status will be displayed.

In the main akYtec Cloud window, click the **Devices on map** link. A window will open:



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 show a process map using a library of ready-made animated mnemonic symbols.

When visualizing a facility, you can display:

- a static or animated image (a photo / screenshot from any editor);
- text;
- parameter values;
- facility control (writing parameters to the device);
- alarm events by means of signaling elements - circle / square, Data element;
- elements of technological process visualization.

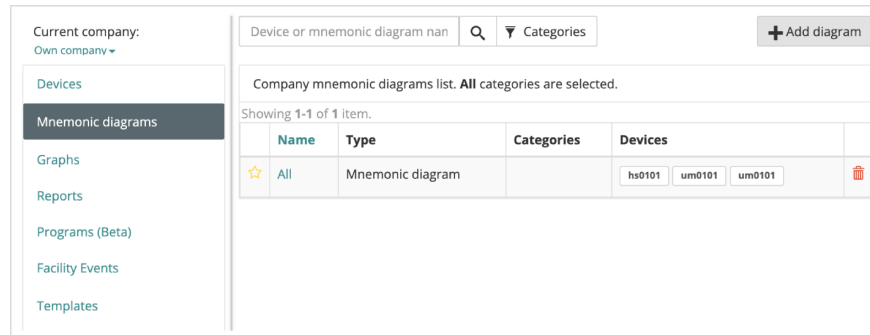
Access to and number of mnemonic diagrams is determined by user privileges (see [Section 12](#)).

To display mnemonic diagrams, the user must have access to the devices and templates involved in the mnemonic diagram.

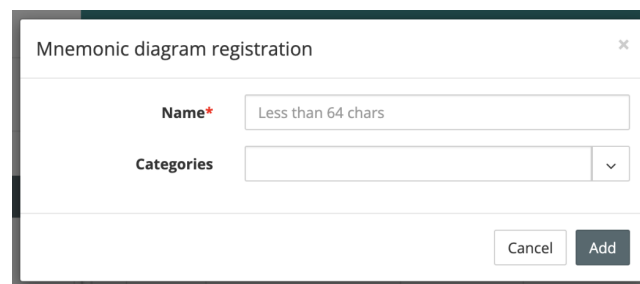
## 9 Monitoring and analysis

### 9.5.1 Creating a mnemonic diagram

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



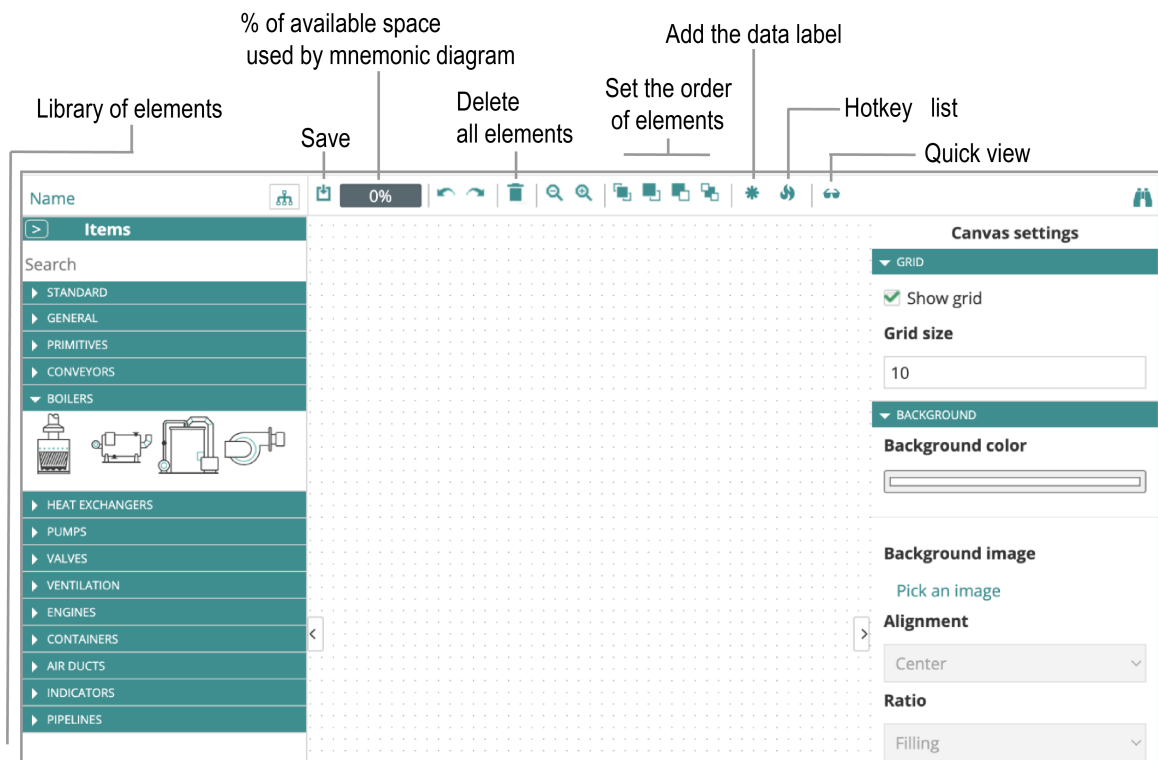
Click the **Add diagram** button. A window will open:



**Name** – enter / change the mnemonic diagram name.

**Categories** – select the groups to which the mnemonic diagram will belong.

Click the **Add** button. The visualization editor window will open:



Select an item in the library and drag to the canvas while holding down the left mouse button.

## 9 Monitoring and analysis

### 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 of the canvas or set a background image

**Background image** – if necessary, add an image by clicking the **Pick an image** link. 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** – select the alignment of the image relative to the canvas. Possible options: left, center, right;

**Ratio** – select the type of fill;

**Opacity** – set the transparency of the image;

**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** — width, height, angle of rotation, 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** — select the alignment of the image relative to the canvas. Possible options: left, center, right;

– **Ratio** — select the type of fill;

– **Opacity** — set the transparency of the image;

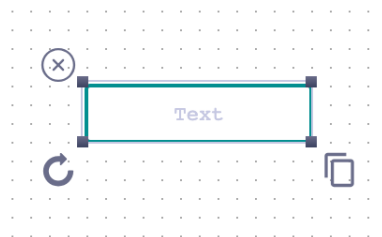
– **Save ratio** — check the box to preserve the image aspect ratio. If unchecked, the image is stretched to the size of the item without saving the aspect ratio.

### 9.5.1.3 Text

If necessary, set the following item characteristics::

– **Representation (contour, fill, contour thickness, contour type)**;

– **Text (color, size, thickness, <text>).**



### 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:

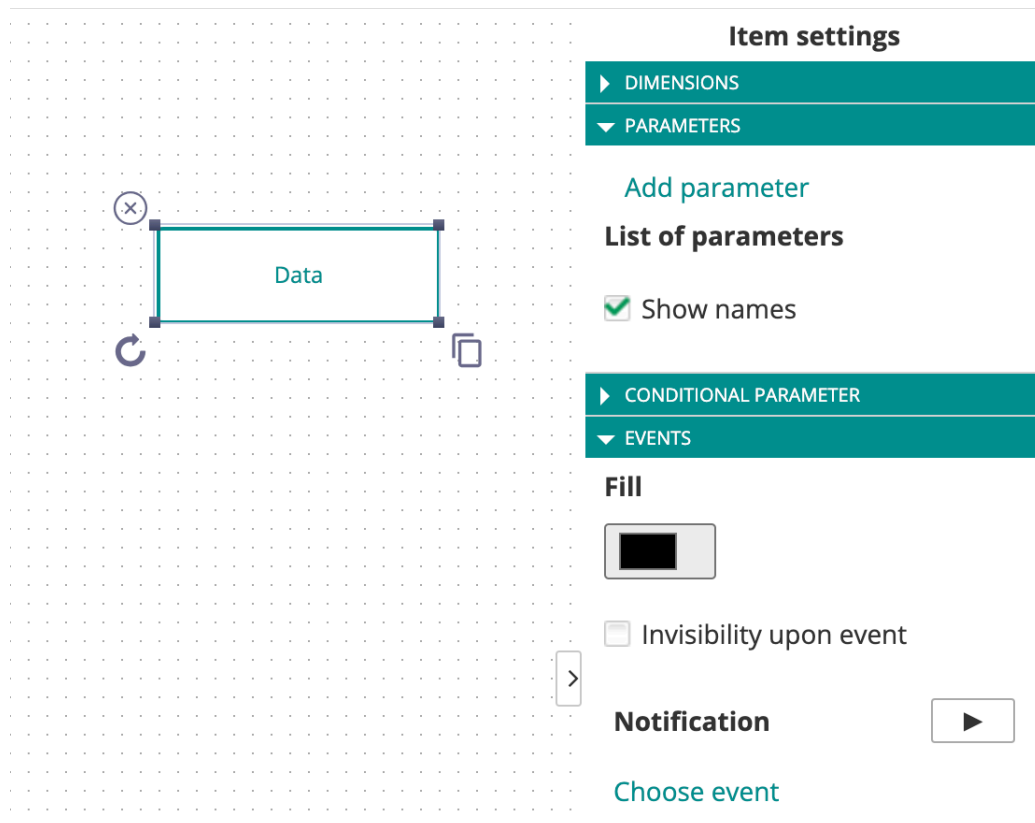
– **Dimensions** (width, height, angle of rotation, position on the canvas);

– **Parameters** (<parameter>, check box to **Show names**);

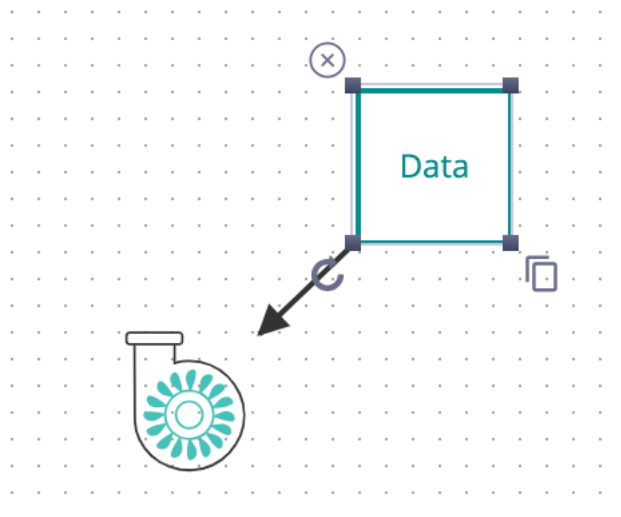
– **Events** – when an event is triggered, the Data object turns red;

– **Representation** (contour, fill, contour thickness, contour type);

– **Text** (color, size, thickness, <text>)



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:

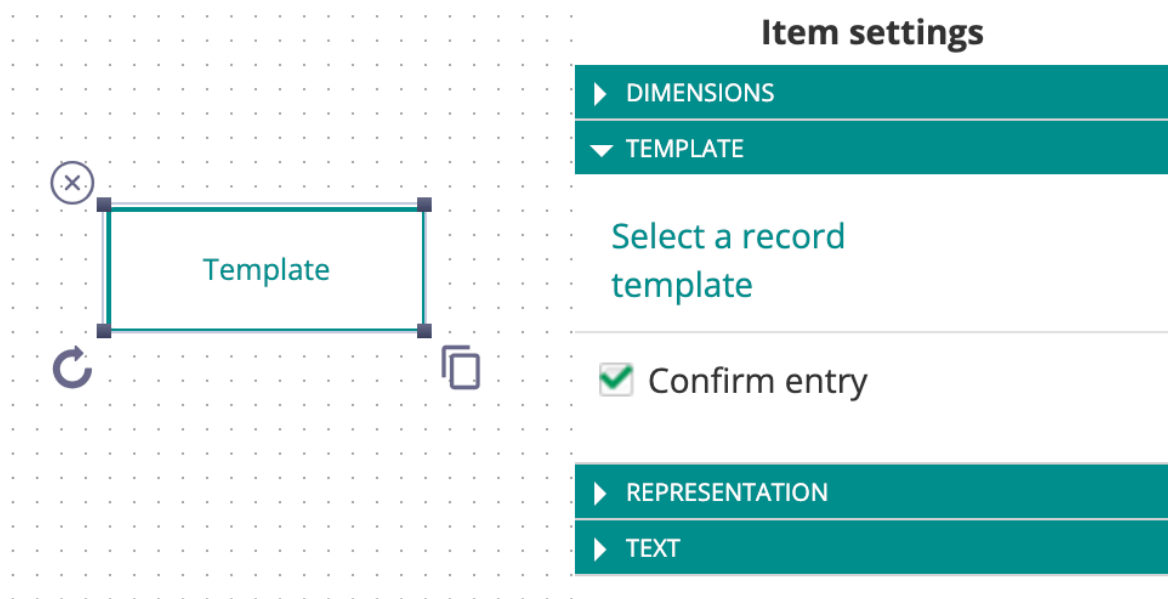


#### 9.5.1.5 Facility control, parameter writing (Write template)

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

- **Dimensions** (width, height, angle of rotation, position on the canvas);
- **Write template** (<write template>, check box to **Confirm entry**);
- **Representation** (contour, fill, contour thickness, contour type);
- **Text** (color, size, thickness, <text>);





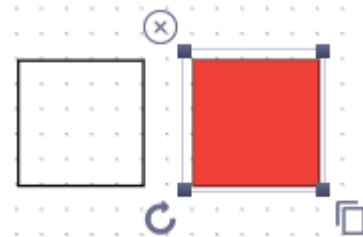
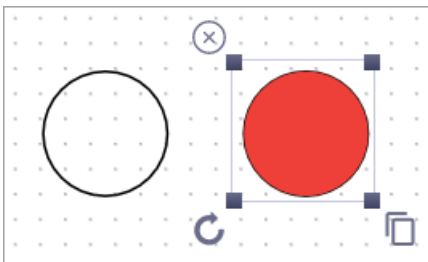
**Item settings**

- ▶ DIMENSIONS
- ▼ TEMPLATE
  - Select a record template
  - Confirm entry
- ▶ REPRESENTATION
- ▶ TEXT

#### 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:

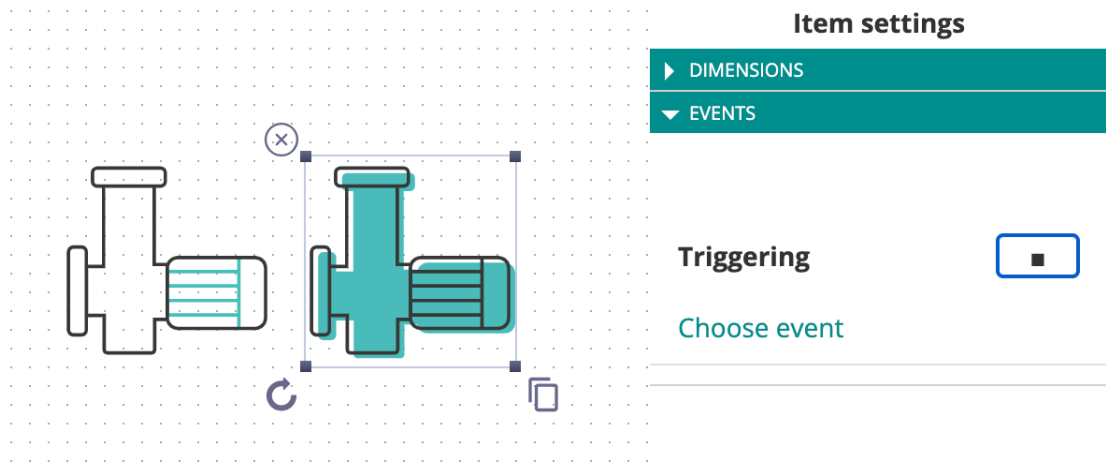
- **Dimensions** (width, height, angle of rotation, position on the canvas);
- **Events** – select an event to display by clicking the **Choose event** link. Fill depends on the event status (transparent / red).



#### 9.5.1.7 Process visualization items

If necessary, set the following item characteristics:

- **Dimensions** (width, height, angle of rotation, 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, some items are animated (they rotate when the event is triggered).



General view of the library of process items::

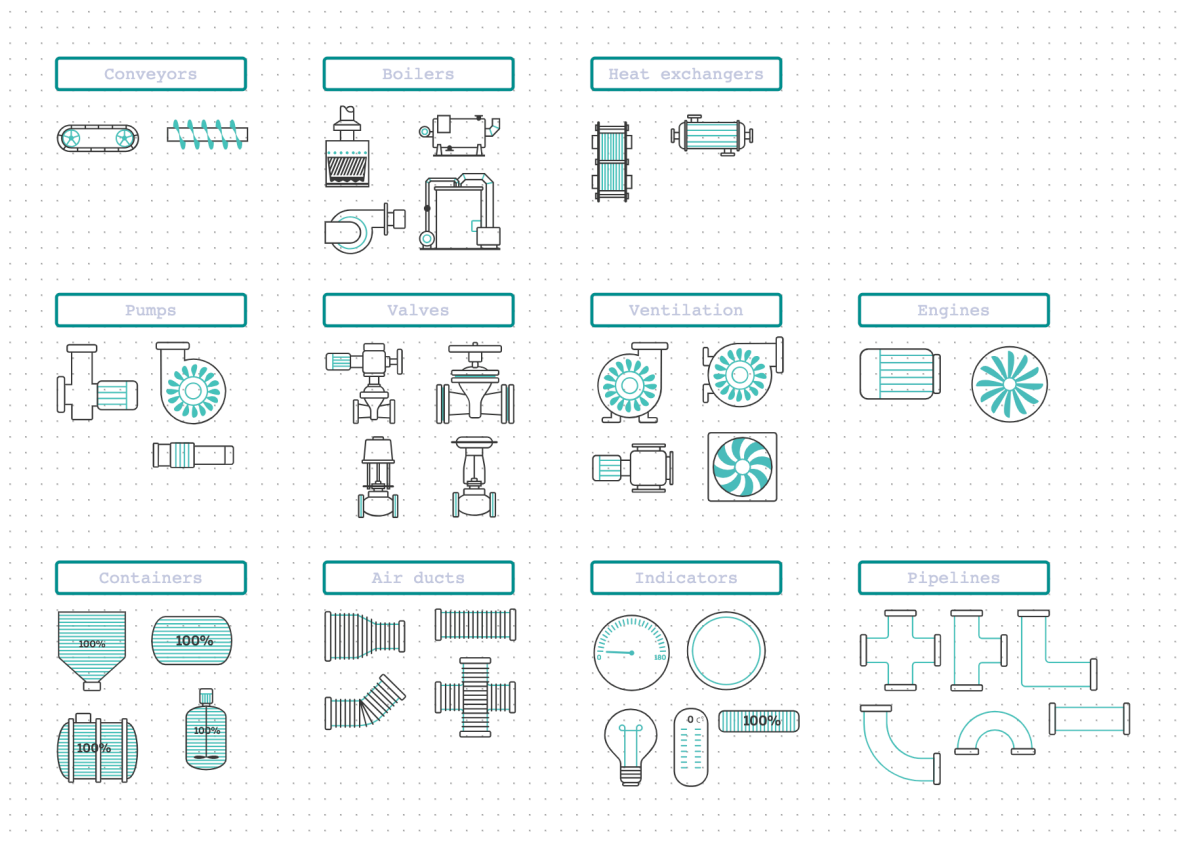


Table 9.3 Hotkeys used with mnemonic diagrams

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

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Item No.	Key combination	Description
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	If the Shift button is pressed, the item is resized with the same proportions
12	Ctrl + up, down, left, right arrows	Resize element width / height
13	Shift + up, down, left, right arrows	Change the position of an item relative to the canvas

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

In the **Devices or Facility events** tab, select the device and the 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 window will open:

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

### 9.6 Custom graphs

Two types of graphs are available to the user to analyze 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** – real-time monitoring of the parameter interaction from **different devices** on the **auto-update** graph for a period of up to 60 minutes (see [View a custom graph, trend, or event diagram](#));
- **Event diagram** – a report displaying information on events of the device or facility in the form of a Gantt chart for a certain period of time. The event diagram allows you to 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 comparing the triggering of important events;
- creating a personalized report 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 window will open:

The screenshot shows the 'Administration' section of the akyttec cloud interface. The 'Graphs' tab is selected in the left-hand navigation menu. The main content area displays a search bar for 'Graph name' and a table titled 'List of company user graphs.' The table contains one entry:

	No	Name	Type	Categories	Description	
☆	1	001	History graph	New category		🗑️

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

The 'Add a graph' dialog box contains the following fields and controls:

- Name\***: A text input field.
- Category**: A dropdown menu with 'Root category' selected.
- Report type**: A dropdown menu with 'Event diagram' selected.
- Buttons**: 'Undo' and 'Add' buttons located at the bottom right.

## 9 Monitoring and analysis

**Name** – enter a name for the custom report;

**Category** – select the groups which the custom graph will belong to;

**Report type** can be a 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 open:

Preview  
Save | View

Report type History graph

**Name\***

**Category**

**Description**

**Parameters** + Add

The list is empty

**Events** + Add

The list is empty

The **Parameters** field is displayed only for the Graph or Trend report type.

**Parameters** – select the parameters for plotting the graph. Click the **Add** link. A window will open:

Undo

Choose parameter

Parameters

- Root category
  - Demonstration devices
    - hs0101
    - PR200 - Presentation
    - um0101
    - um0101

All parameters

- Charge
- Temperature
- Humidity

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

Report type History graph

**Name\***

**Category**

**Description**

**Parameters** + Add

Temperature

Temperature

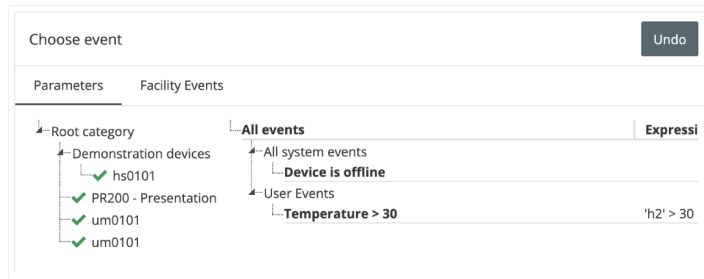
hs0101

■
✎
✕

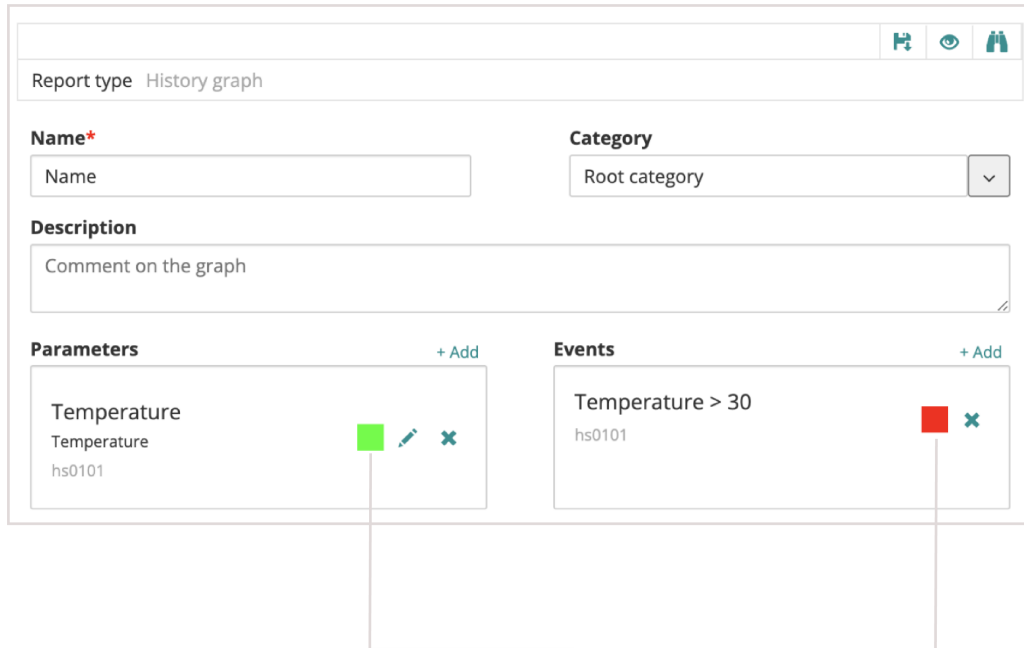
**Events** + Add

The list is empty

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



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



Click to select graph color

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 window will open:

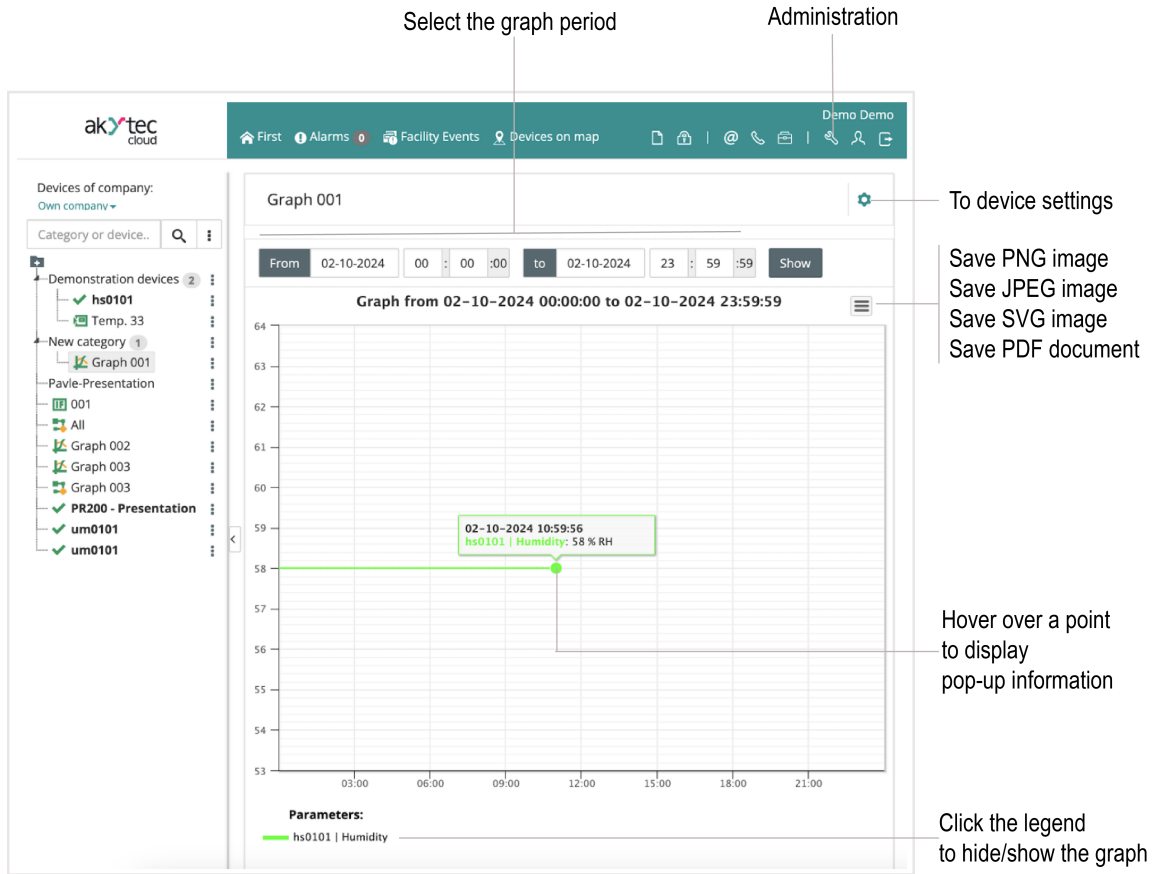


Fig. 9.1 Custom graph



**NOTE**

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

- When you select a trend, a window will open:

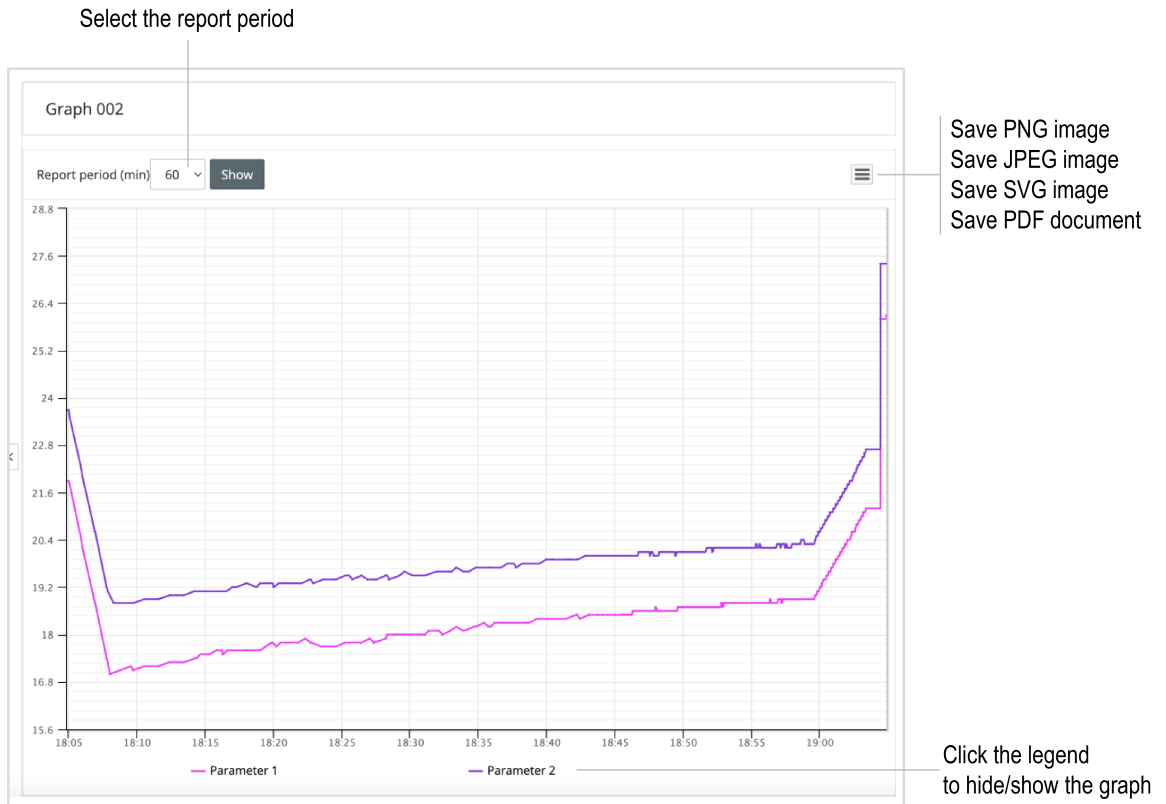


Fig. 9.2 Trend

- When you select an event diagram, a window will open:

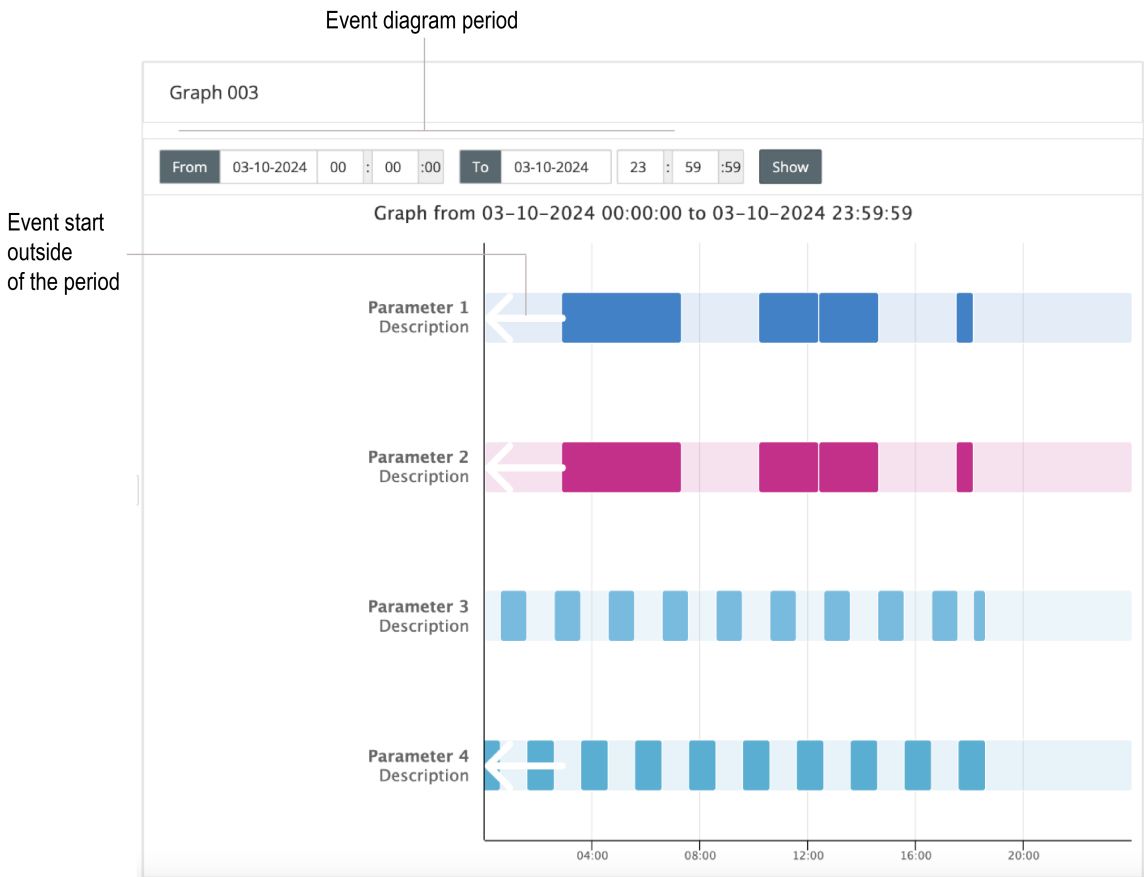


Fig. 9.3 Event diagram





### NOTE

The active event is not ended 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 reports include data from devices in different time zones, the time in the report is 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 the specified conditions;
- events;
- templates to write from different devices
- 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 window will open:

	Name	Categories	Description	
☆	Desktop 001	Root category	description	🗑️

To create a desktop, click the **Add desktop** button. A window will open:

**Add desktop**

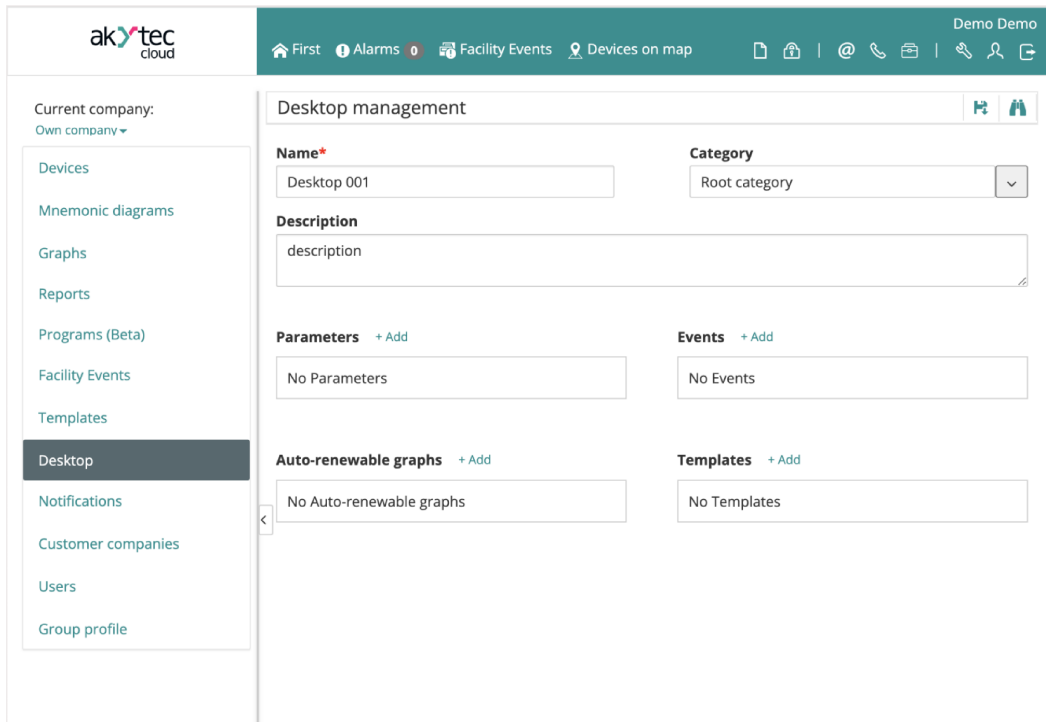
Name\*

Category  ▼

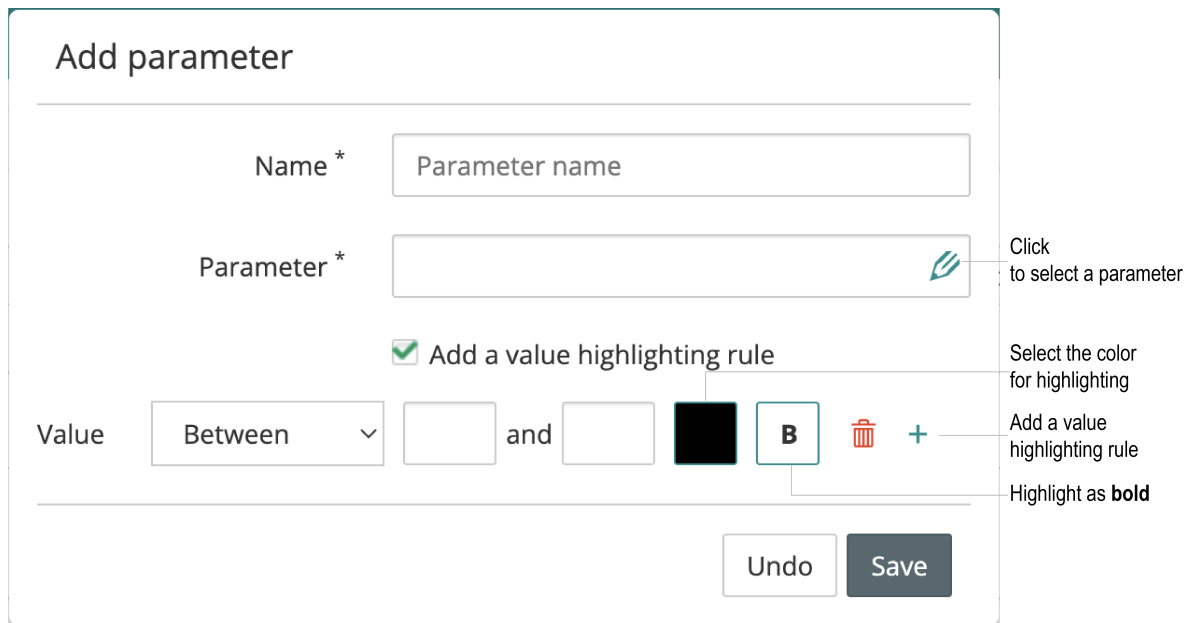
**Name** – enter a name for the desktop.

**Category** – select the directory in which the desktop will be placed.

Click the **Continue** button. A window will open:



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



**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 open:

**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 the **Templates** section. A window will open:

**Name** – enter a name for the template.

**Template** – select ready-made templates.

**Confirm the record** – check this box if you want to confirm the template start.

**Add trend** (auto-renewable graphs with a period of up to 60 min) to be displayed on the desktop. Before that you need to **create a trend**. The maximum number of trends is 1. Click the **Add** button in the **Trends** section. A window will open where you can select a trend:

### 9.7.2 Viewing desktops

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



### 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 window will open:

Current company: Own company ▾

Devices  
Mnemonic diagrams  
Graphs  
Reports

Report name   Categories

List of company user reports.

	Name	Type	Categories	
☆	Report 001	Consolidated	Root category	<input type="button" value="🗑"/>

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

### Add report

Name\*

Category  ▼

Report type  ▼

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

Report Management 🔍 🗨️ 🏠

Report type Consolidated

**Name\***

**Category**

 ▼

**Description**

Comment on the report

**Parameters**

[+ Add Section](#) [+ Add parameter](#)

Name	Function	Filtering condition	
No records found			

To create a report:

- create or add report sections;
- create or add report parameters.

### Adding sections

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

Parameters
[+ Add Section](#) [+ Add parameter](#)

Name	Function	Filtering condition	
▼ Section 1	✎ 🗑️		
▼ Section 2	✎ 🗑️		
Section 3	✎ ✖ 🗑️		

### Adding parameters

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

Editing a report field

Name \*

Group

Unit

Display accuracy

Function \*

Filtering condition

Add a value highlighting rule

- 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.

Device management: hs0101

General settings Event settings **Parameter settings**

Export to JSON Clear all parameters Import... Settings

Parameter	Code	Read function	Record function	Register address	Unit of measurement	Data format	Wi-Fi	Bluetooth	MQTT	Settings	Chart	Alert
Charge	h1	03	non recordable	F9	% RH: % RH	int32	✓	✓	✓	✓	✓	✓
Temperature	h2	03	16	FB	deg: °C	float	✓	✓	✓	✓	✓	✓
Humidity	h3	03	non recordable	FD	% RH: % RH	int32	✓	✓	✓	✓	✓	✓

Expression calculator

1

Category or device...

- Root category
  - Demonstration device
    - hs0101
      - Temperature
      - Humidity

Undo Continue

The list of available device parameters is defined in the device settings - visibility **Display in parameters** (see [Section 8.3.3](#)).

Table 9.4 Description of functions

CounterTime ()	Total time
Avg()	Arithmetic mean Sum of values divided by their number
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 amount
SumDistinct()	Sum of all unique (non-repeating) values
CountDistinct()	Number of unique values

Table 9.5 Restrictions when working with functions

<b>It is not allowed to use parameters without a function:</b>	
<function ("parameter_1")> +<function ("parameter_2") >	valid

## 9 Monitoring and analysis


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


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

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

Click the save report button.

### 9.8.2 Viewing the consolidated report

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

To report settings 

Report 003

**From** 03-10-2024 00 : 00 :00 **To** 03-10-2024 23 : 59 :59 **Show**

Object 1					
Max temperature	30.3 °C	Humidity	38.225 % RH	Work time	19:27:00 (81.04%)
Min temperature	16.9 °C				
Object 2					
Max temperature	31.8 °C	Humidity	35.076 % RH	Work time	19:27:00 (81.04%)
Min temperature	18.4 °C				

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



## 10 Events and notifications

The service provides the possibility to configure and control events for individual devices and 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** — the setting of events by facility / is defined on the basis of parameters for one device or a group of devices in the **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 events and facility events:

- setting the type of event: **simple** (informational) or **alarm**;
- setting a **schedule** to record events only on certain days of the week and times;
- tracking information: by whom and when events were read;
- setting 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 window opens:

General settings   <b>Event settings</b>   Parameter settings										
										<a href="#">Edit notifications</a>
										<a href="#">+ Add new event</a>
Name	Active	Alarm	Expression	Delay	Schedule	E-mail	SMS	Telegram		
v All system events										
└ Device is offline	✓			300		demo@akytec.rs				
v User Events										
└ Temperature > 30	✓		'h2' > 30	60		demo@akytec.rs				

Click the **Add new event** button. A window will open:

New event creation ×

**Message\***

**Expression**

**Delay\***

 sec

**Trigger graph\***

Always
  Repeat
  Period

Active  
 Alarm

Receive notifications about:  Event start  Event end

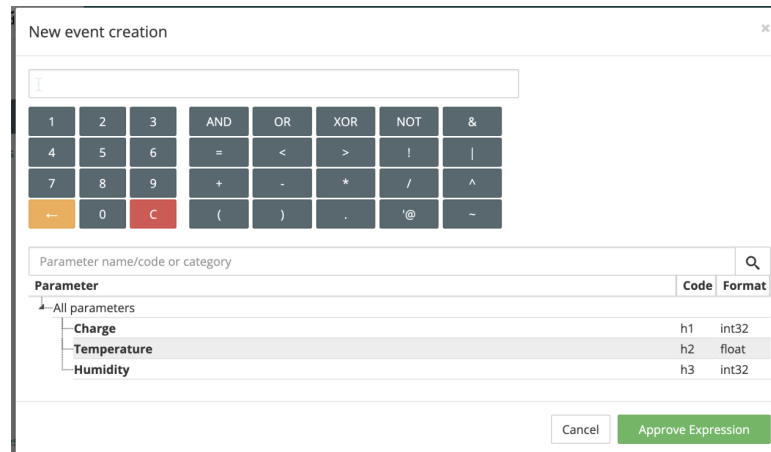
Email Addresses for notifications (max 9)

**Message** – name of the event.

**Expression** – enter a logical expression that defines the condition for an event to occur. The list of supported operators and example expressions is given in [Table 10.1](#). The list of available

parameters for event condition generation is defined in the device settings (see [Customizing the display of parameters in reports](#)).

Click the **Edit** button to get the expression for the event. A window will open:



Enter a logical expression given the following conditions:

- the "."(point) character is used as a floating point separator;
- the order of operator processing is from left to right;
- operators placed in brackets are processed first;
- the bits are numbered from zero.

Table 10.1 Event Operators

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

No.	Operator	Description
17	<=	Less than or equal to
18	>=	Greater than or equal to
<b>Additional operators</b>		
15	(...)	Priority setting operator
16	@	Parameter error code retrieval operator (see example 3 below)
<p><b>Examples of expressions:</b></p> <ul style="list-style-type: none"> <li>- wInput1 &lt; 10 The alarm will be active as long as the value of the wInput1 parameter is less than 10.</li> <li>- (xInput1=1) AND (xInput2=1) The alarm will be active as long as the parameters xInput1 and xInput2 are TRUE (1).</li> <li>- @wInput1=255 The alarm will be active as long as the polling error code of the wInput1 parameter has a value of 255 (no response from the device).</li> <li>- (wInput1 &amp; 4) = 4 The alarm will be active as long as the second 1 bit of the wInput1 variable is TRUE (1).</li> </ul>		

Click the **Approve Expression** button.

**Trigger delay** – enter the time period for which the event condition must be met before the event is generated.

**Trigger graph** – select the schedule for checking the event triggering condition. Possible options:

- **Always** – the condition of the event is checked 24/7, daily;
- **Repeat** – the event condition is checked on the specified days of the week and only at the specified time interval. Specify the "FROM" and "TILL" times and select the days of the week on which to perform the check of the event condition;

**Trigger graph\***

Always
  Repeat
  Period

**From** 
**Till**

Active  
 Alarm

**Receive notifications about:**
 Event start
  Event end

**Email Addresses for notifications (max 9)**

Week days ▾

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

- **Period** – the event condition is checked in the specified time period. Specify the "FROM" time and day of the week and the "TILL" time and day of the week between which the event condition should be checked.

**Trigger graph\***

**From** 
**Days of the week**

**Till** 
**Days of the week**

**Active**  
 **Alarm**

**Receive notifications about:**
 **Event start**
 **Event end**



**NOTE**

Events are displayed taking the following into account:

- if the condition of event start and end is fixed outside the schedule, the event will not be displayed. For example, if you set a repeat from 8-00 to 18-00 and the event condition was met from 21-00 to 22-00 then the event is not displayed.
- if the condition of event start is fixed outside the schedule and the event continues during the schedule validity period, the event start coinciding with the schedule validity period will be displayed. For example, if you set a repeat from 8-00 to 18-00 and the event occurred at 7-00 - the start of the event will be displayed at 8-00.

**Active** – check the box if you want the event to be checked;

**Alarm** – check the box if this event is to be classified as an alarm. Viewing alarms in akYtec Cloud:

- by 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 send notifications when an event starts and/or ends.



**NOTE**

The setting affects only receiving notifications via telegram\_bot and e-mail and does not affect the display of events in reports.

**E-mail notification list** – list of e-mail addresses (with "," or ";") to receive notifications. The maximum number is 9.

**List of Telegram notification recipients** – add Telegram notification recipients by clicking the **Add** link. Check if there is a token for 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 open:

hs0101  last updated 2 minutes ago

Parameters Tables Graphs **Events** Parameter record Configurations

---

From  Till

Showing 1-1 of 1 item. [Mark all alarms "read"](#)

Message	Logging start	Logging stop	Parameter values	Importance	Read by
Device is offline	02-10-2024 15:22:09	02-10-2024 16:06:00	<a href="#">details</a>	Event	not supported

## 10 Events and notifications

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
- **Gray** – complete event;
- **Blue** – incomplete event.

The report contains the following information about the 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 window will open:

List of company facility events.

Showing 1-1 of 1 item.

Active	Alarm	Devices	Name	Expression	Delay	Schedule		
✓		<div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">PR200 - Presentation</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">hs0101</div>	'PR200 ...*P512' > 'hs0101...*h2'	'PR200 -...*P512' > 'hs0101 ...*h2'	0 sec	Always		

To add an event, click the **Add** button. A window will open:

New event creation x

**Message\***

**Expression**

Edit...

**Delay\***

 sec

**Trigger graph\***

Always
Repeat
Period

Active

Alarm

Receive notifications about:  Event start  Event end

Email notification list (maximum 9)

Use character "," or ";" to separate items in the list

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 when an 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 open:

hs0101 
 last updated 3 minutes ago ⚙️

Parameters Tables Graphs **Events** Parameter record Configurations

---

Latest data Period data
From Till 26-09-2024 00 : 00 : 00 Show

15 All events Any status Event Type

Showing 1-1 of 1 item. Mark all alarms "read"

Message	Logging start	Logging stop	Parameter values	Importance	Read by
Device is offline	02-10-2024 15:22:09	02-10-2024 16:06:00	<a href="#">details</a>	Event	not supported

[Export to Excel](#)

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 by account devices and facilities in one window.

Click the **Alarms** link in the main akYtec Cloud window. A window will open:

Event type filter:

- system
- custom
- facility events

Enable/disable sound notification

Current alarm list

Event type

Logging start	Device names	Event	Read by	
03-10-2024 13:39:43	Device 1	Event 1	Demo Demo (03-10-2024 14:03:28)	<a href="#">parameters</a>
03-10-2024 13:39:28	Device 2	Event 2	Demo Demo (03-10-2024 14:03:27)	<a href="#">parameters</a>
30-09-2024 18:34:09	Device 3	Event 3	Demo Demo (01-10-2024 09:04:41)	<a href="#">parameters</a>
21-09-2024 10:05:09	Device 4	Event 4	Demo Demo (21-09-2024 11:57:23)	<a href="#">parameters</a>

Export to Excel

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. **e-mail**;
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 about device events and by facility events of the integrator customers' companies (see [Notification setup](#)).

#### 10.4.2 Notification setup

This section describes all rules for notifications that have been configured for device events or facility events.

Notifications are configured:

- when setting the device events;
- when setting 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 that have a system integrator status to configure event notifications in the integrator customer account:

- Customer Manager;
- Customer Viewer.

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

Edit notification

+ Add

List of notifications.

Event	Device	E-mail	Telegram bot	
Temperature > 30	hs0101	demo@akytec.rs		 

Delete notification

The notification list displays event notifications for the devices available to the user and if the corresponding privilege is available (see [Section 14.2](#)). Create a rule to send notifications by clicking the **Add** button. A window will open:

Creating notifications

---

**Event\*** [Add event](#)

The list is empty

**Receive notifications about**  The start of event  The end of event

**List of Telegram bot notification recipients** [Add user](#)

The list is empty

**List of Email Notification Recipients** [Add e-mail](#)

The list is empty

[Undo](#) [Save](#)

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

Choose event [Undo](#)

Devices Facility Events

	Expression	Alarm	Active
<ul style="list-style-type: none"> <li>Root category</li> <li>└ Demonstration devices                             <ul style="list-style-type: none"> <li>└ hs0101</li> <li>└ PR200 - Presentation</li> <li>└ um0101</li> <li>└ um0101</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>All events                             <ul style="list-style-type: none"> <li>All system events                                     <ul style="list-style-type: none"> <li>Device is offline</li> </ul> </li> <li>User Events                                     <ul style="list-style-type: none"> <li>Temperature &gt; 30</li> </ul> </li> </ul> </li> </ul>		
		No	Yes
	'h2' > 30	No	Yes

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 send notifications when an event starts and/or ends.



**NOTE**

The setting affects only receiving notifications via Telegram bot and e-mail and does not affect the display of events in reports.

Specify the services and notification recipients:



## 10 Events and notifications

- 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 both in the customer company and users from their integrator company.

Select a company user	
Name	E-mail
A A	*****@akytec.de
Demo Demo	demo@akytec.de

- notification recipients by e-mail by clicking the **Add e-mail** link. A window will open where you can enter the e-mail addresses of users to receive notifications. The maximum number of e-mails is 9.

### 10.4.3 Device notification setup

Open the **Devices** tab in the **Administration** section. Select a device by clicking on its name. The window with the device settings will open.

Open the **Event settings** tab. A window opens:

General settings   <b>Event settings</b>   Parameter settings										
<a href="#">Edit notifications</a>   <a href="#">+ Add new event</a>										
Name	Active	Alarm	Expression	Delay	Schedule	E-mail	SMS	Telegram		
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Device is offline</li> </ul> </li> </ul>	✓			300						<a href="#">✎</a>
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Temperature &gt; 30</li> </ul> </li> </ul>	✓		'h2' > 30	60		demo@akytec.rs				<a href="#">✎</a> <a href="#">🗑</a>

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

### Editing notifications

---

**Event\***

Gate is offline (Greenhouses) ✘

Pump failure (Greenhouse #1) (Greenhouses) ✘

**Receive notifications about**     The start of event     The end of event

**List of Telegram bot notification recipients**    [Add user](#)

The list is empty

**List of Email Notification Recipients**    [Add e-mail](#)

The list is empty

---

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

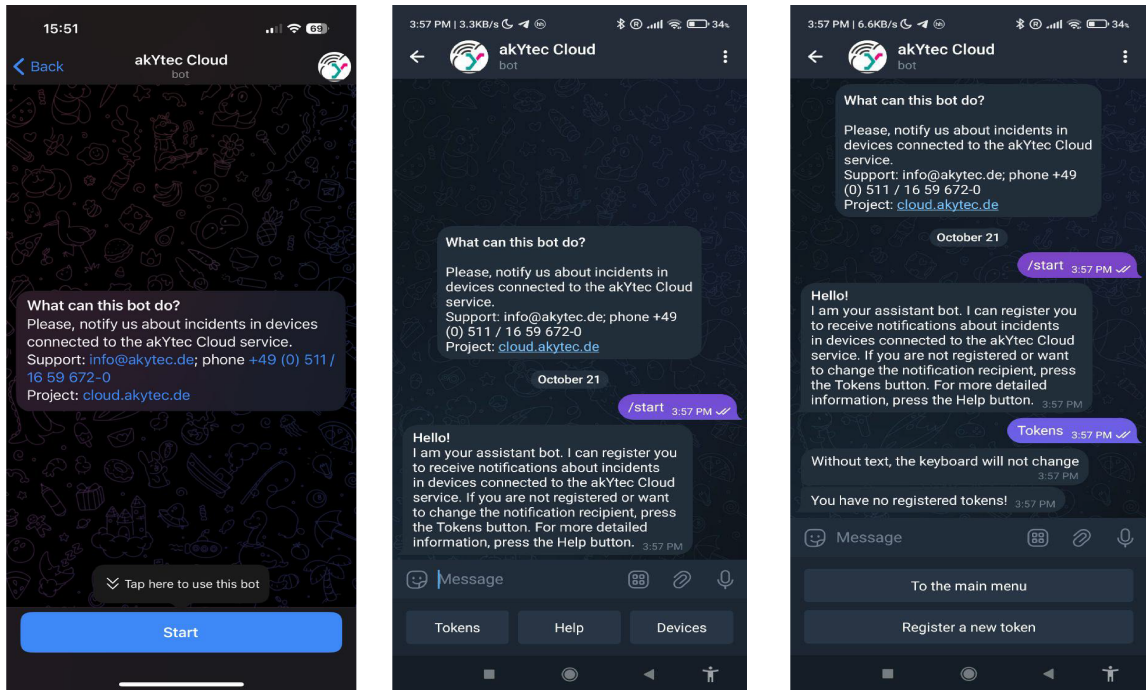
### 10.4.4 Telegram bot setup

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 in the telegram bot (akYtec Cloud Bot).

To work with akYtec Cloud Bot:

- in the Telegram messenger, add a bot by going to [https://t.me/akYtec\\_Cloud\\_Bot](https://t.me/akYtec_Cloud_Bot);
- in akYtec Cloud, go to **Administration / Users** and click the **Edit** button.





- Click the **Tokens** button. Click the **Register a new token** button.
- Enter a token or send an image of the QR code.

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

## 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 into case of 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.

**Recording a set of controlled parameters (configuration) into the device** is used in the following cases:

- to store a configuration ("recipes"). akYtec Cloud stores up to 5 recipes. akYtec Cloud provides configuration recording into the device and allows you to view and compare configurations;
- to roll back settings and configuration changes. If errors were made when setting up the device, it is possible to return to the previous configuration;
- when replacing a device. If a device fails and needs to be replaced, akYtec Cloud saves the settings of the old device and allows you to set them for the new device.

### 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 open:

Parameter	Code	Current value	New value	Updated
Charge	h1	63		02-10-2024 13:46:36
Temperature	h2	25	20	02-10-2024 13:46:36
Humidity	h3	58		02-10-2024 13:46:36

Get the values of manageable parameters out of the queue

In the **New value** column enter the values of only those parameters that you want to change. Click the **Record** button. A window will open:

«Old» value

Recorded value

## 11 Remote control

**Repeat logging attempts for** – specify the time to make 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 prohibit recording of a 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 open:

Parameters Tables Graphs Events **Parameter record** Configurations

Active commands and parameters Command log

Latest data Period data From Till 25-09-2024 00 : 00 : 00 15 Show

Showing 1-9 of 9 items.

User	Date/time created	Status	Maximum duration	Desynchronization allowed
***** (*****@akytec.de)	01-10-2024 16:35:24	Completed	600 sec	Yes
***** (*****@akytec.de)	23-09-2024 09:04:16	Completed	600 sec	Yes
Demo Demo (demo@akytec.de)	18-09-2024 17:32:12	Completed	600 sec	Yes
***** (*****@akytec.de)	16-09-2024 11:47:19	Completed	600 sec	Yes
***** (*****@akytec.de)	10-09-2024 12:47:45	Completed	600 sec	Yes
Demo Demo (demo@akytec.de)	09-09-2024 11:14:14	Completed	600 sec	Yes
Demo Demo (demo@akytec.de)	09-09-2024 11:12:46	Completed	600 sec	Yes
Demo Demo (demo@akytec.de)	02-09-2024 13:53:49	Completed	600 sec	Yes
Demo Demo (demo@akytec.de)	02-09-2024 13:50:47	Completed	600 sec	Yes

Maximize/minimize information about command

Specify the time interval of data to be displayed in the report by selecting **Latest data** or **Period data** and by setting 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 open

Current company: Own company

Name of the device or template to be recorded

Company templates list. All categories are selected.

Showing 1-2 of 2 items.

Template name	Devices	Last execution
☆ Alarm	hs0101	02-10-2024 13:24:13
☆ Temp. 33	hs0101	02-10-2024 12:58:41

Navigation menu: Devices, Mnemonic diagrams, Graphs, Reports, Programs (Beta), Facility Events, **Templates**, Desktop

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

Add a record template ✕

---

**Name\***

**Categories**

**Description**

**Do not record if values change in the device during recording**

**Name** – enter a name for the template.

**Categories** – select the groups to which the template will belong.

**Description** – enter a description of the template.

**Do not record if values changed in the device during recording** – check the box to prohibit recording of a new parameter value if the old value has changed.

Click the **Save** button. A window will open:

Template management: Template 001 👤

---

General settings

Parameters

---

Record template settings Save

**Name\***

**Repeat attempts for\***

**Description**

**Categories**

**Do not record if values change in the device during recording**

---

Device	Parameter	New value	Last value	Last update
No results found.				

**Repeat attempts for** – specify the time to make recording attempts if the first attempt is unsuccessful.

Open the **Parameters** tab. A window will open:

Template management: Template 001

General settings
Parameters

---

Edit parameters of the record template
Save

- └─ Root category
- └─ Demonstration devi...
- └─ ✓ hs0101 Spirin
- └─ ✓ PR200 - Present...

Device		
hs0101 Spirin	↑	🗑️
Parameter	New value	
└─ All parameters		
└─ Temperature		

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

## 12 Adding and configuring user rights

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

User access rights
System integrator access rights

Edit the user profile

Set up the user access rights

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

Add new user
✕

**Surname\***

**Name\***

**Phone**

**Skype**

**Email\***

**Password\***

**Password confirmation\***

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



Manage access rights for \*\*\*\* \* (\*\*\*\*@\*\*\*\*.com) ✕

Company : Demo Company

Own company access    Customer company access

Available privileges

- Administrator
- Profile manager
- Categories manager
- Device manager
- Mnemonic diagrams manager
- Graph Manager
- Report Manager
- Program Manager
- Desktop Manager
- Event manager
- Command manager
- Configuration manager
- Own settings manager

Own profile settings: name, email, password, etc...

Available categories

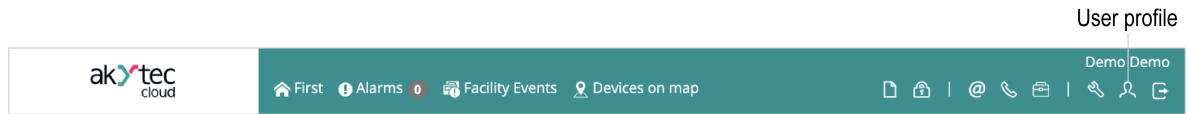
- Demonstration devices
- New category
- Pavle-Presentation

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.

## 13 User profile

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



A window will open:

The 'User data' window is divided into two main sections: 'General settings' and 'Personal settings'.  
**General settings:** Includes fields for 'Surname\*' (masked with \*\*\*\*\*) and 'Name\*' (masked with \*\*\*\*\*) with a 'Save' button below. It also has fields for 'Phone' and 'Skype'.  
**Change password:** Includes fields for 'Current password\*', 'Password\*' (with a note 'Not less than 6 chars'), and 'Password confirmation\*' (with a note 'Not less than 6 chars'), followed by an 'Update password' button.  
**Personal settings:** Includes a checked checkbox for 'Display parameter code in reports' and an 'Update settings' button.

If necessary, change the user data.

If it is necessary to display the parameter code in the Parameters, Tables, Graphs, Events reports, check the box in the **Personal settings** section.

## 14 Company administration (system integrator status)

The system integrator status is intended to distribute devices belonging to different customer companies into their own accounts with the ability to monitor the operation of the customer's equipment.

A customer company can be an individual or a legal entity.

To become a system integrator, send a request to [info@akyttec.de](mailto:info@akyttec.de).

### 14.1 Adding a customer company

A customer company is added as an individual. If you need to become to a legal entity, send your request to [info@akyttec.de](mailto:info@akyttec.de).

Open the **Customer companies** tab in the **Administration** section. A window will open:

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

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

14.2 Configuring user access rights to customer companies

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

Manage access rights for **Demo Demo** (demo@akyttec.de) ✕

Company : **Demo Company**

---

Own company access    Customer company access

Available privileges

- Customer viewer
- Customer profile manager
- Customer manager

Available customers

Check the boxes to provide access according to privileges:

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

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

### 15 Integration

#### 15.1 API

Third-party software can interact with **akYtec Cloud** using a *REST*-like programming interface (*API*). API is designed to access the data available in the service. *JSON* is used as the main output format, but the customer can also request data in the *XML* format.

API documentation is available at: <https://api.akytec.com/>.

akYtec Cloud has a limit on the number of requests that can be processed in a time interval of 10 seconds coming from a single IP address. The timing starts with the first request in the new request sequence. If the limit is exceeded, status code **429 (Too Many Requests)** is returned. The limits are described below:

- /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.

## 16 Connection of akYtec devices

### 16.1 Connection over RS485 (via gateway)

#### Device setup

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

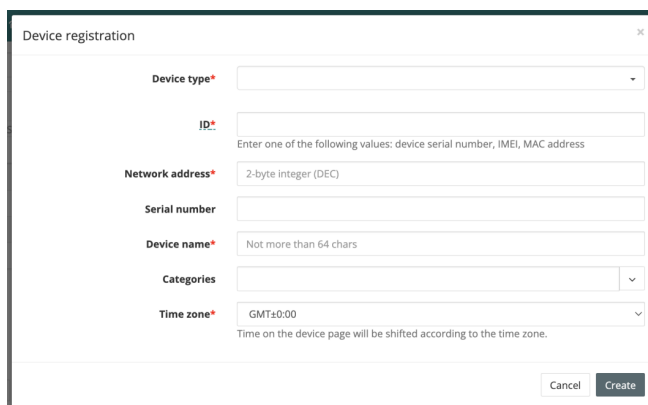
Table 16.1 Network settings

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 open:



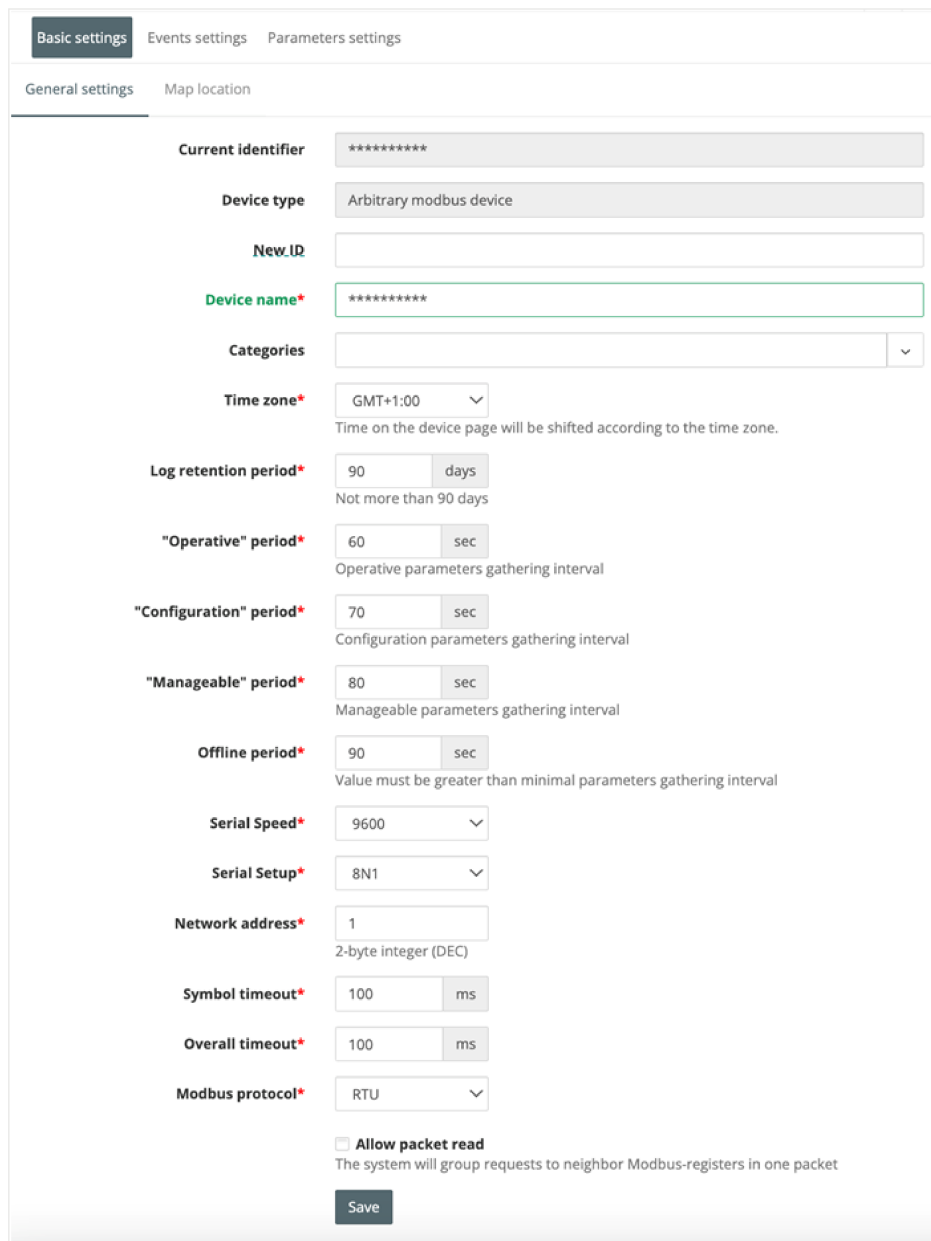
Specify the following settings for the device and gateway:

- **Device type** – select the device to be connected;
- **ID** – enter the network gateway ID (indicated on the gateway enclosure):
  - for GG–24–Cloud, GE–24–Cloud, GW–24–Cloud – serial number of the gateway (indicated on the gateway enclosure).

- **Network address** – enter the device address in the RS485 network which has been set during device setup (see [Table 16.1](#));
- **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 set device network setting (see [Table 16.1](#)). A window will open:



- **Serial speed**– set the COM port speed;
- **Serial setup** — select the COM port settings, in the following format:
  - the number of information bits for one 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.

## 16 Connection of akYtec devices

- **Device parameters polling periods** – set the periods of polling of operative, configuration and **manageable** parameters (*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 speed up 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 (*Customizing the display of parameters in reports*):

Parameter	Code	Read function	Write function	Register address	Unit of measurement	Data format	Wi-Fi	Bluetooth	Modbus	MQTT	HTTP	JSON	XML	CSV	PDF	Print	Refresh	Delete
All parameters +																		
Charge	h1	03	non writable	F9	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature	h2	03	16	FB	deg: °C	float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Humidity	h3	03	non writable	FD	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . You will see the main akYtec Cloud window with the **Parameters** tab.

Check that the parameter values have been recorded to the device by clicking on the **Write commands** tab.

Parameter	Code	Title
All parameters		
Charge	h1	63 % RH
Temperature	h2	25 °C
Humidity	h3	58 % RH



#### CAUTION

To enable verification, the list must contain the **manageable** -type parameters.

### 16.2 Connection over Ethernet

Mx210 modules are connected over Ethernet.

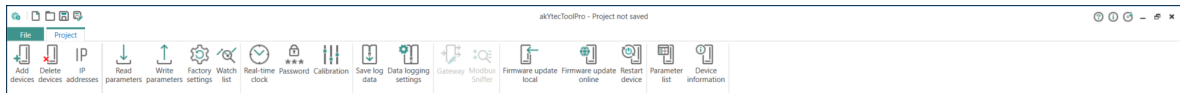
The akYtec devices with Ethernet must be connected to a local network with Internet access.

#### Configuring the device in akYtec Tool Pro

1. Connect the device to a PC according to the device user guide.
2. Install and start akYtec Tool Pro.



3. Connect to the device using akYtec Tool Pro and click the **Read parameters** button



Set **Connection to akYtec Cloud** to On in the **Network settings / akYtec Cloud connection settings** section.

In the **Modbus Slave / Remote access rights from akYtec Cloud** section, set:

- configuration enable - enabled.
- manage and record values - enabled;
- access to Modbus registers - full access.

On the **Ethernet settings** tab, set the device network settings according to the network requirements (IP address, mask, gateway). Click the **Write parameters** button.

Set the password that will be used to access the device from the akYtec Cloud service by clicking **Set Password**.



#### CAUTION

If you do not have a password, you cannot connect the device to akYtec Cloud.

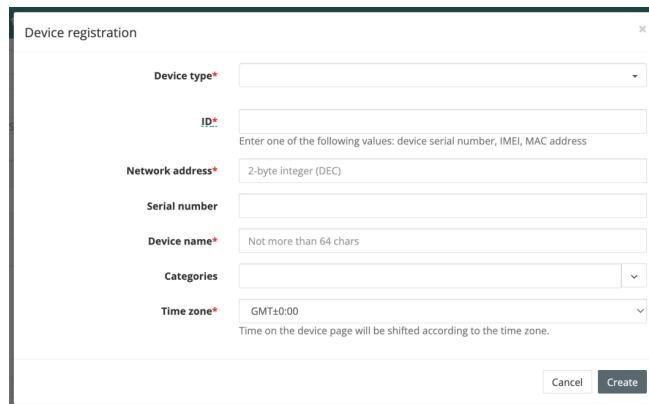
Reboot the device to apply the settings.

### Adding the device to akYtec Cloud

Connect the device to a LAN with Internet access.

Open your browser and type in <https://cloud.akytec.de/>. Log in. The main akYtec Cloud window will open.

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



- **Device type** – select the device to be connected;
- **ID** – 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.

Go to the device setup by clicking on the device name, select **General settings / Basic settings**. Enter the password set in akYtec Tool Pro:

**Current identifier**

**Device type**

**New ID**

**Password**

**Device name\***

**Adding device parameters to akYtec Cloud**

The parameter list is read automatically from the device.

**Verifying the data exchange between akYtec Cloud and the device**



To view the current values of the device parameters, click . You will see the main akYtec Cloud window with the **Parameters** tab. Check that the parameter values have been recorded to the device by clicking on the **Write commands** tab.

The screenshot shows the akYtec Cloud interface. On the left is a sidebar with a tree view of devices, including 'Demonstration devices' with 'hs0101' selected. The main area displays the details for device 'hs0101', which is 'last updated 4 minutes ago'. Below this, there are tabs for 'Parameters', 'Tables', 'Timing diagrams', 'Events', 'Write commands', and 'Configurations'. The 'Parameters' tab is active, showing a table of parameters:

Parameter	Code	Title
Charge	h1	63 % RH
Temperature	h2	25 °C
Humidity	h3	58 % RH

An 'Export to Excel' button is located at the bottom right of the parameter list.

**NOTE** To enable verification, the list must contain the **manageable**-type parameters.

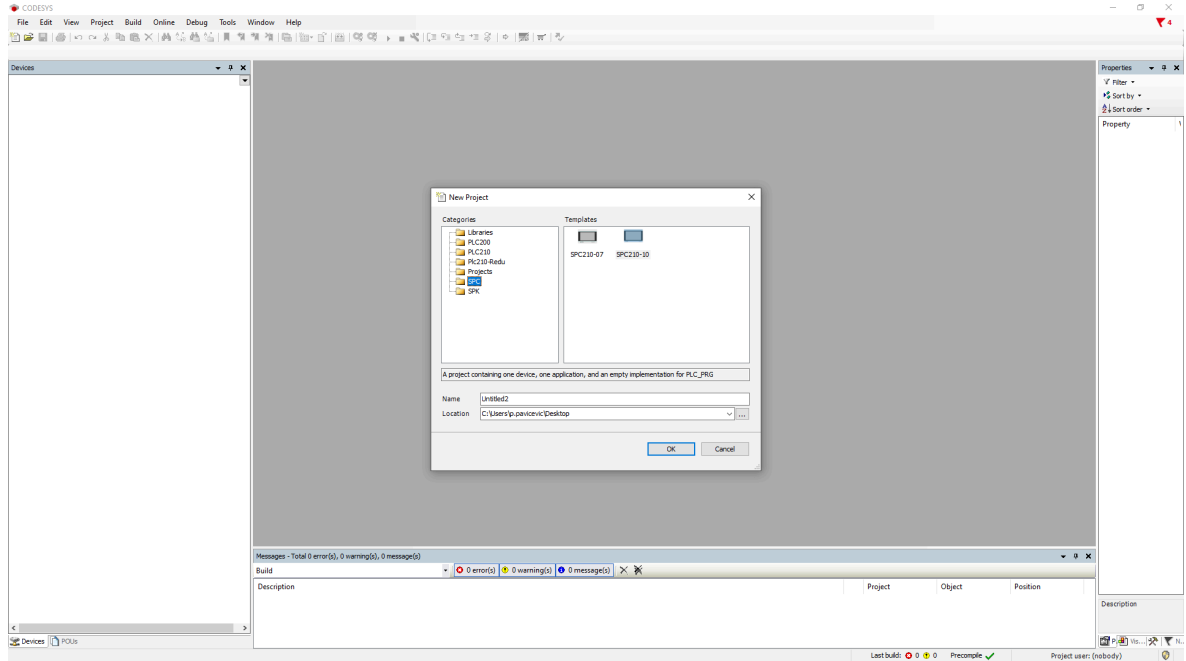
## 17 Connection of PLC210 and SPC210 with Codesys 3.5

### 17.1 Connection over RS485 (via gateway)

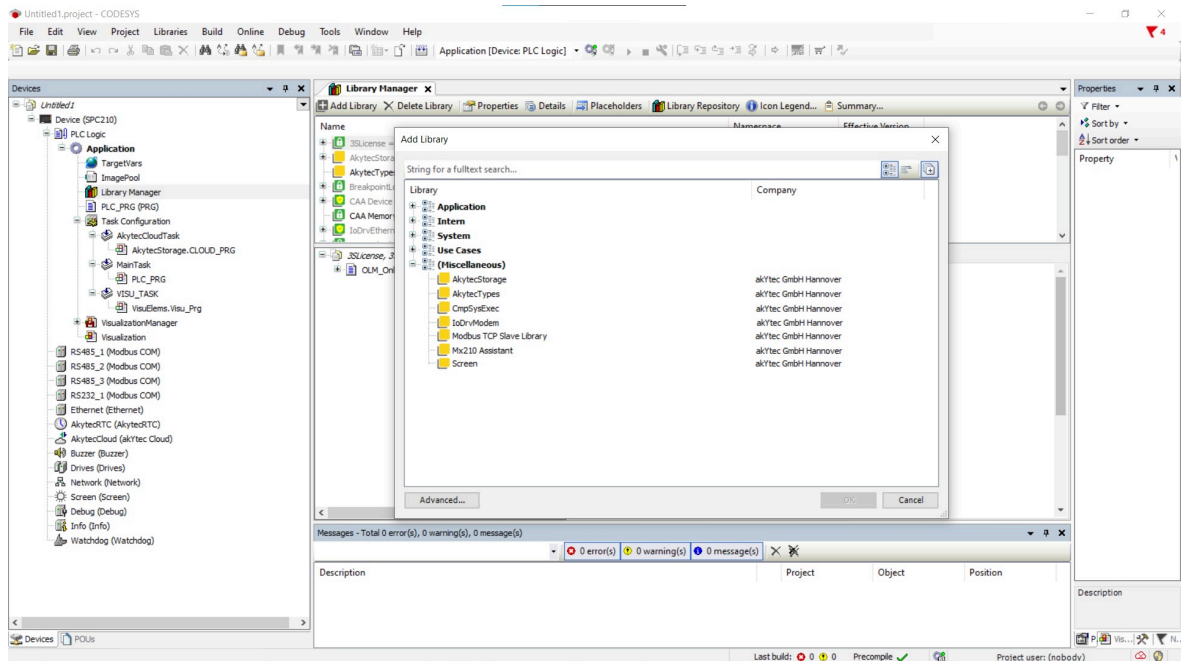
PLC210 and SPC210 are connected as described in this section.

#### Creating a project in the CODESYS 3.5 environment

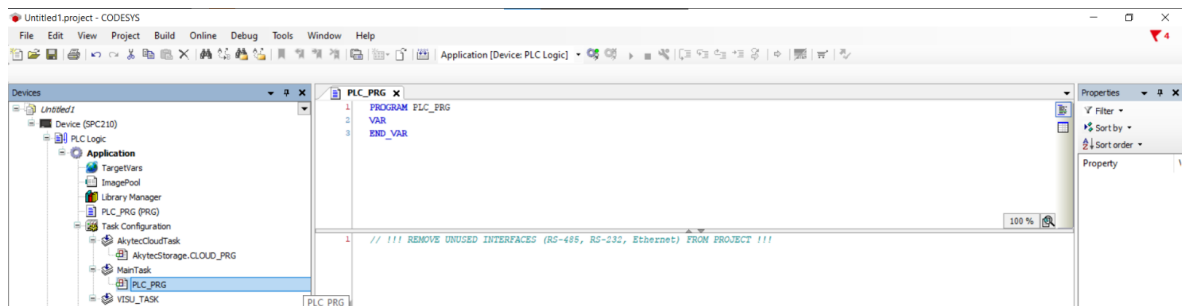
Start CODESYS 3.5 and connect to the device. A window will open:



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:



Consider the following:

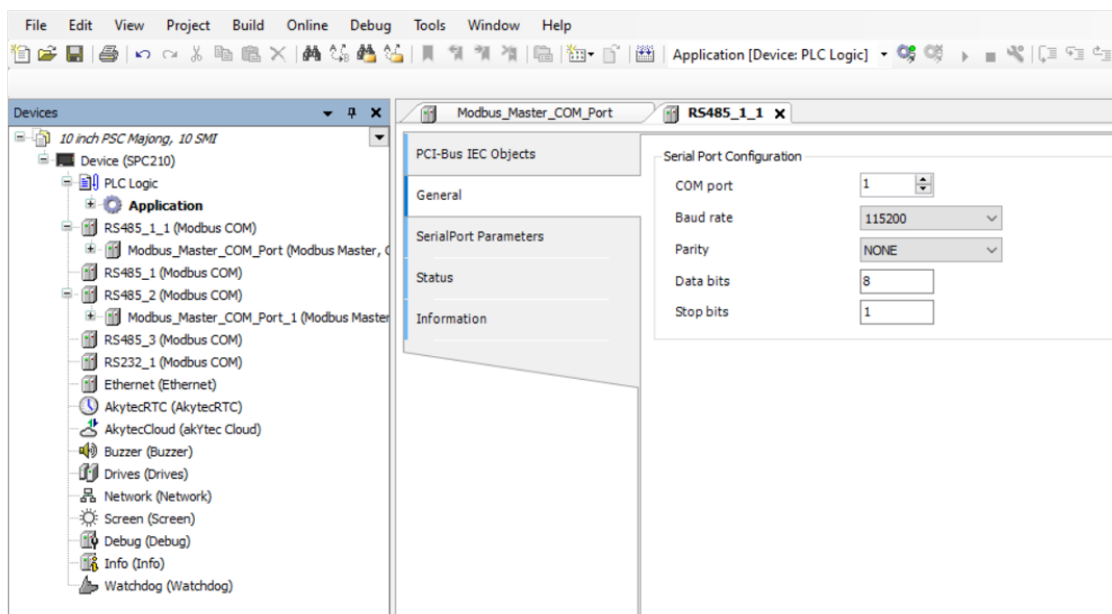
- only variables of BOOL and WORD types can be assigned in the Modbus Slave component;
- if you want to assign a REAL variable, you will need to declare two WORD additional variables:
  - in the program code for REAL variables that are written from akYtec Cloud, you need to merge two WORD variables into a variable of REAL type;
  - in the program code for REAL variables readable in akYtec Cloud, you must parse a variable of REAL type into two variables of WORD type.

```

1 rVar_Write := OCL.WORD2_TO_REAL(wRealVarReg0_Write, wRealVarReg1_Write, FALSE);
2
3 fbRealToWorld2(rInput := rVar_Read, xSwapBytes := FALSE, wOutput1 => wRealVarReg0_Read, wOutput2 => wRealVarReg1_Read);

```

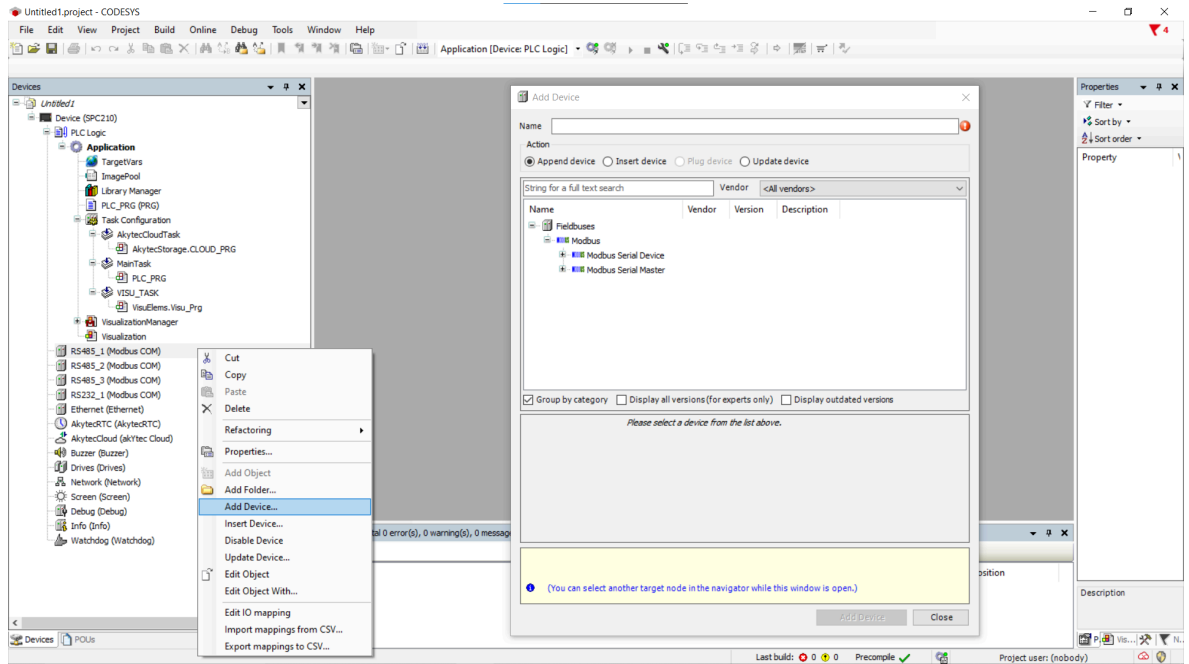
Select the RS485\_1 (Modbus COM) component:



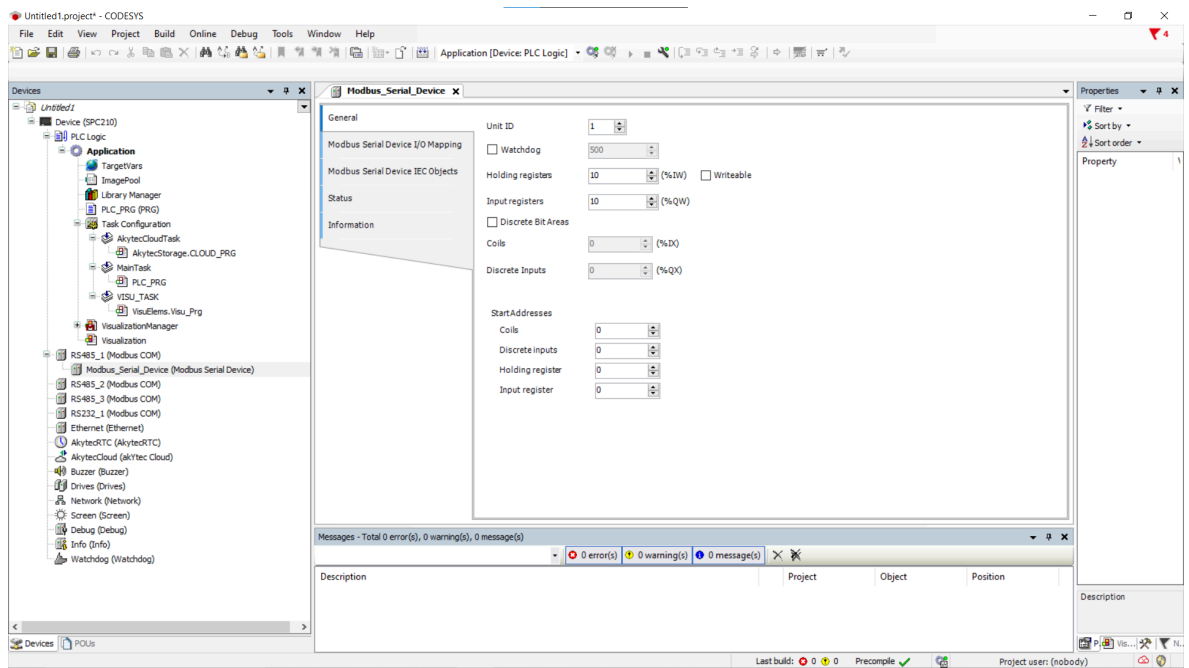
Specify the parameters of the **Modbus COM** component:

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

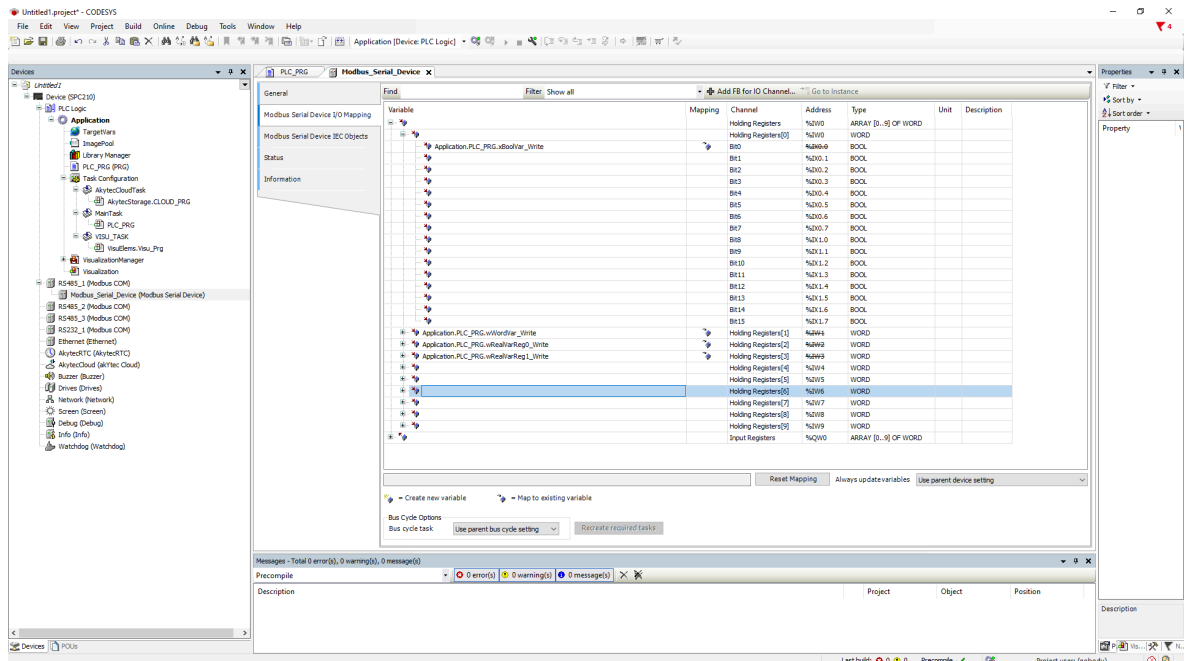
Add **Modbus Serial Device**:



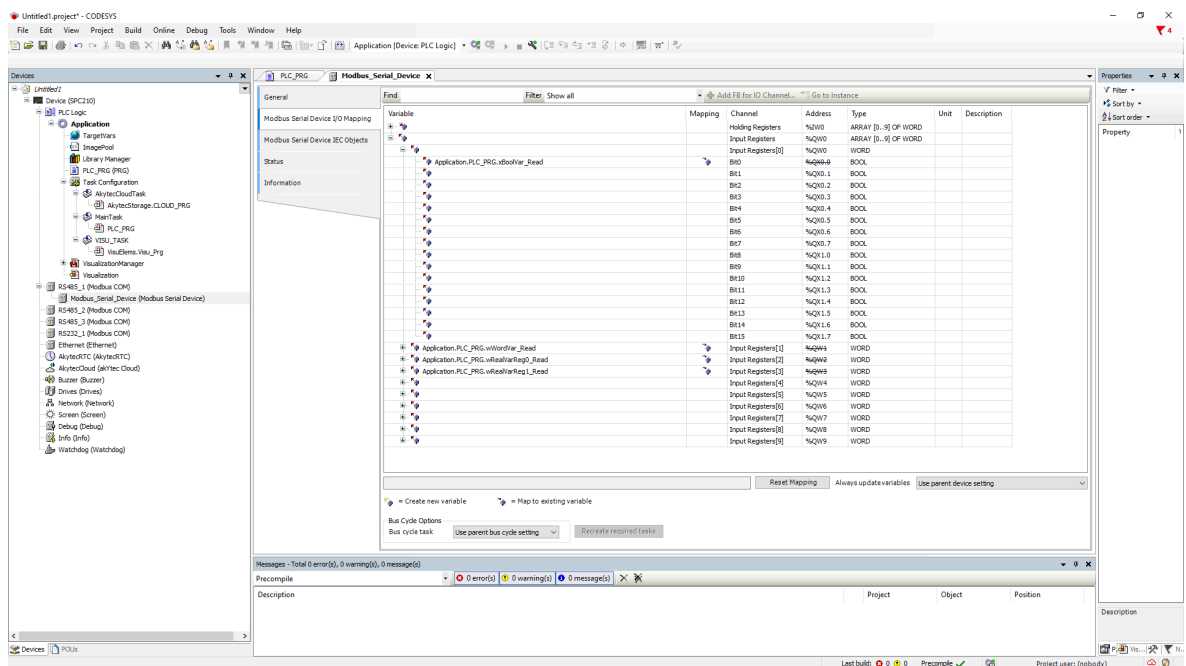
Open the **Modbus Serial Device** tab and specify the slave address of the device:



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



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:

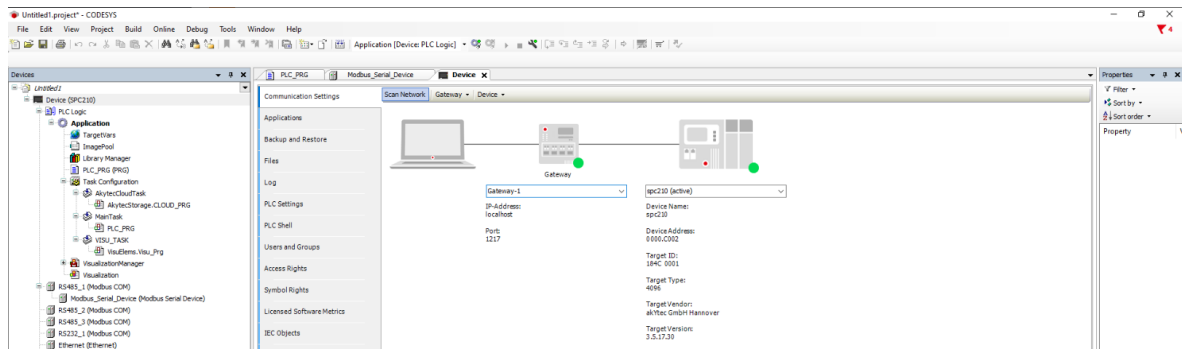


Addressing for each Modbus memory area is independent and is done from 0 register.  
 As a result, the following register map will be generated in the controller (taking into account that variables of REAL type are represented in Modbus Slave as two variables of WORD type):

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

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 or find the device by scanning the network:

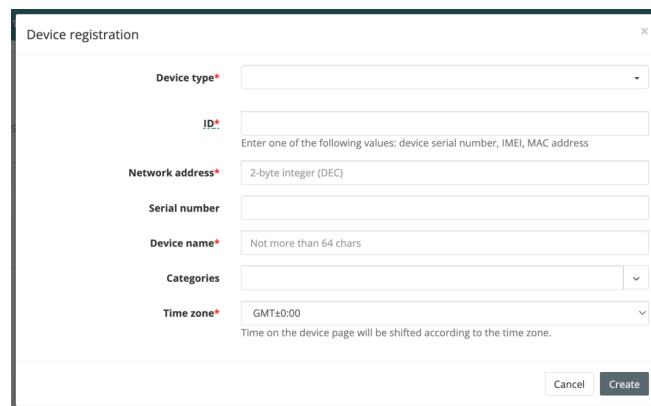


Load the project into the controller and start by selecting **Online / Login and Start (F5)**.  
Connect the GG-24-Cloud gateway to the RS485-1 port of the controller according to the user guide.

### Adding the device and gateway to akYtec Cloud

Open your browser and type in <https://cloud.akytec.de/>. Log in. The main akYtec Cloud window will open.

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



**Device type** – select the device to be connected;

**ID** – enter the network gateway ID (indicated on the gateway enclosure):

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

**Network address**– enter 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.

Select **Basic settings / General setting** in the device settings and specify:

Basic settings
Events settings
Parameters settings

General settings
Map location

Current identifier

Device type

New ID

Device name\*

Categories

Time zone\*

GMT+1:00

Time on the device page will be shifted according to the time zone.

Log retention period\*

90

days

Not more than 90 days

"Operative" period\*

60

sec

Operative parameters gathering interval

"Configuration" period\*

70

sec

Configuration parameters gathering interval

"Manageable" period\*

80

sec

Manageable parameters gathering interval

Offline period\*

90

sec

Value must be greater than minimal parameters gathering interval

Serial Speed\*

9600

Serial Setup\*

8N1

Network address\*

1

2-byte integer (DEC)

Symbol timeout\*

100

ms

Overall timeout\*

100

ms

Modbus protocol\*

RTU

Allow packet read

The system will group requests to neighbor Modbus-registers in one packet

Save

**Serial speed** – set the COM port speed;

**Serial setup** – select the COM port settings, in the following format:

- the number of information bits for one 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 in accordance with the project in CODESYS 3.5.



Basic settings Events settings **Parameters settings**

Export to JSON Clear all parameters Import from file Settings

Parameter	Code	Read function	Write function	Register address	Unit of measurement	Data format	Wi-Fi	Settings	View	Table	Graph	Alert	More
- All parameters													
Charge	h1	03	non writable	F9	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature	h2	03	16	FB	deg: °C	float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Humidity	h3	03	non writable	FD	% RH: % RH	int32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**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 . You will see the main akYtec Cloud window with the **Parameters** tab.

Change the values of the variables in CODESYS 3.5 and monitor the corresponding changes in akYtec Cloud.

Check that the parameter values have been recorded to the device by clicking on the **Write commands** tab.

Device.Application.PLC\_PRG

Expression	Type	Value
xBoolVar_Write	BOOL	FALSE
wWordVar_Write	WORD	44
rVar_Write	REAL	66.77
xBoolVar_Read	BOOL	TRUE
wWordVar_Read	WORD	11
rVar_Read	REAL	22.33
wRealVarReg0_Read	WORD	16818
wRealVarReg1_Read	WORD	41943
wRealVarReg0_Write	WORD	17029
wRealVarReg1_Write	WORD	35389

Parameters Tables Graphs Events Parameter record Configurations

Parameter	Code	Value
- All parameters		
iVar_Read	InputRegister2	22.33
iVar_Write	HoldingRegister2	66.77
wWordVar_Read	InputRegister1	11
wWordVar_Write	HoldingRegister1	44
xBoolVar_Read	DiscreteInput0	1
xBoolVar_Write	Coil0	1

Export to Excel

**NOTE** To enable verification, the list must contain the **manageable**-type parameters.

### 17.2 Connection over Ethernet

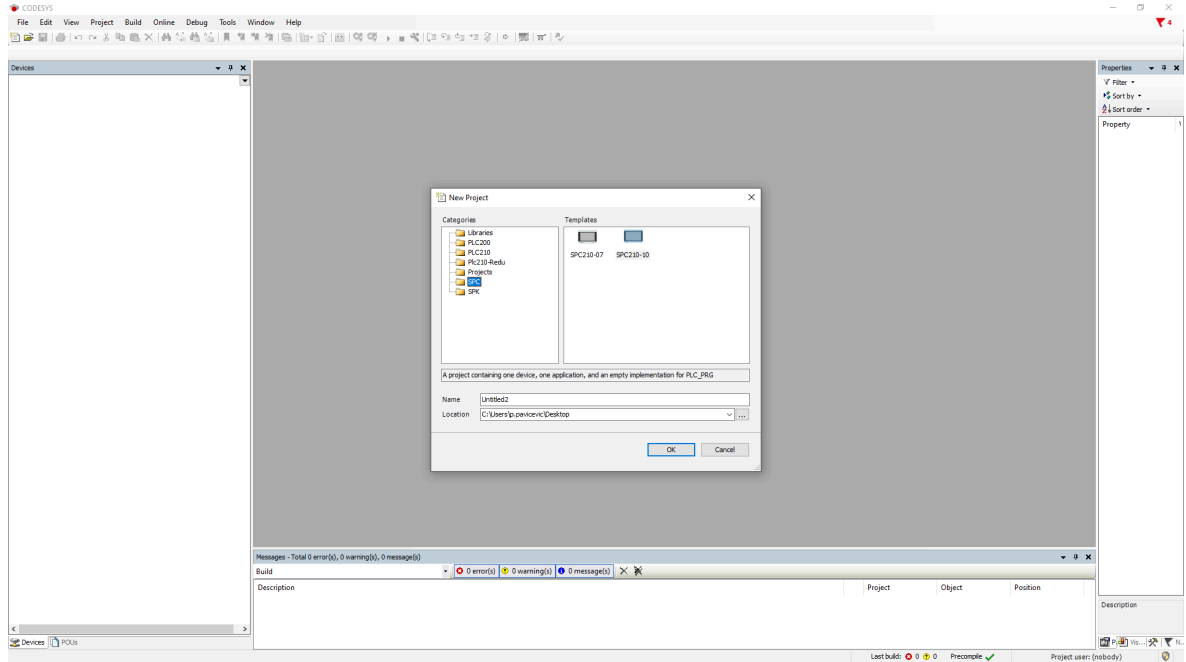
Connection of SPC210 and PLC210 programmed in CODESYS V3.5 SP11 Patch 5 or higher is performed via symbol configuration.

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 - this method is

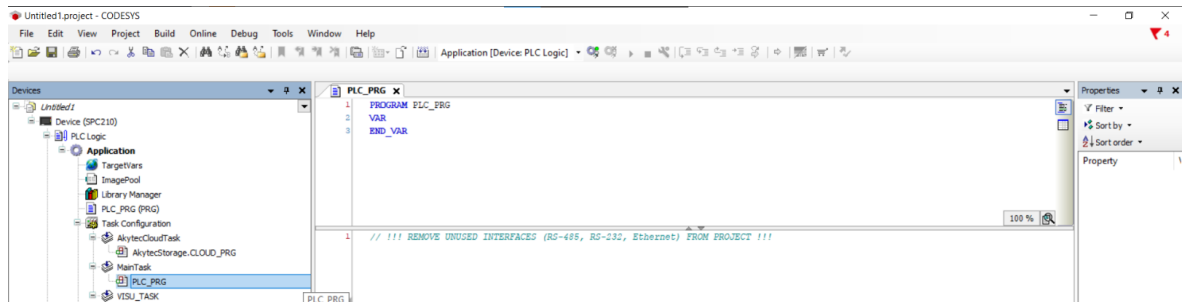
described in version 2.0 of the CODESYS V3.5. Configuring exchange with the upper level is not supported in current firmware.

### Creating a project in the Codesys 3.5 environment

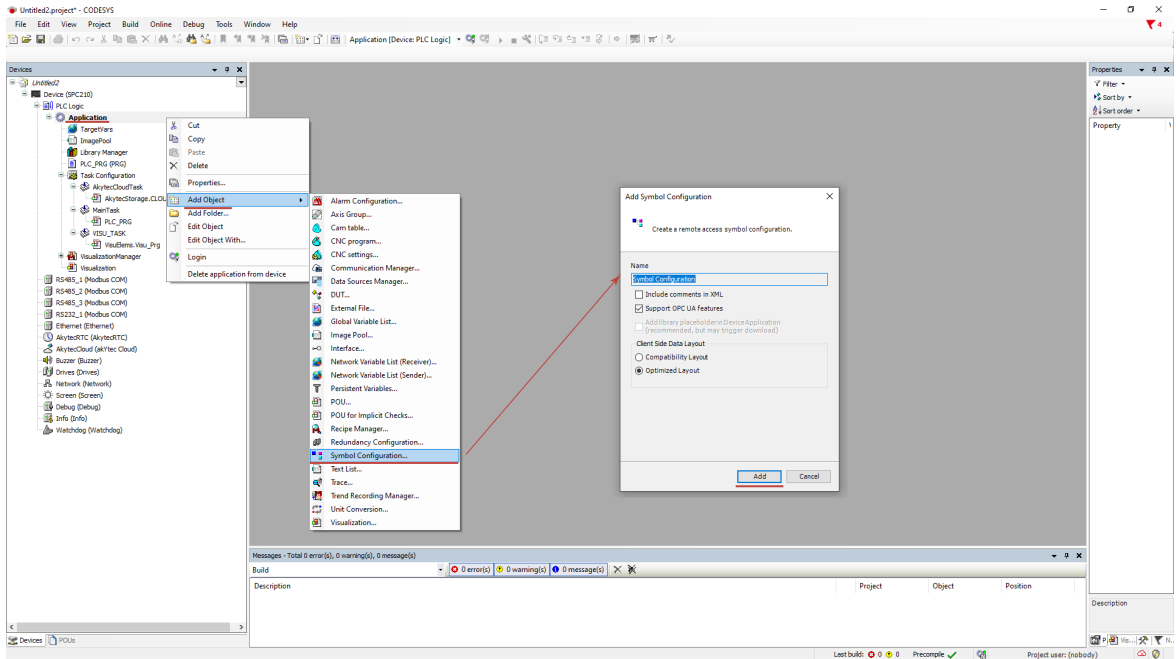
Create a new project in CODESYS V3.5. A window will open:



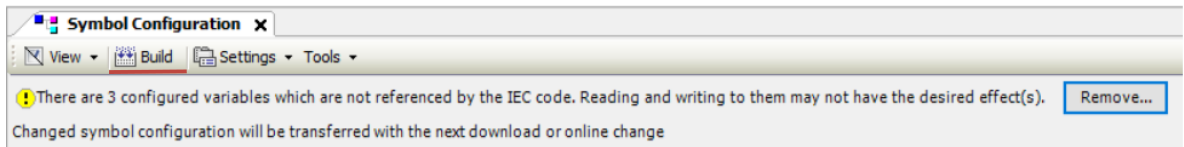
Declare variables for **PLC\_PRG**::



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



Compile the project by clicking **Build**.

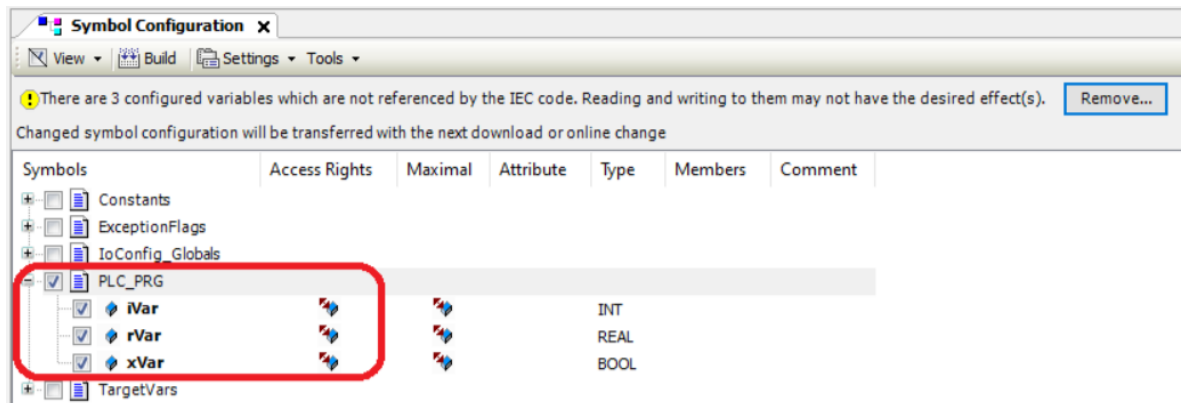


**CAUTION**

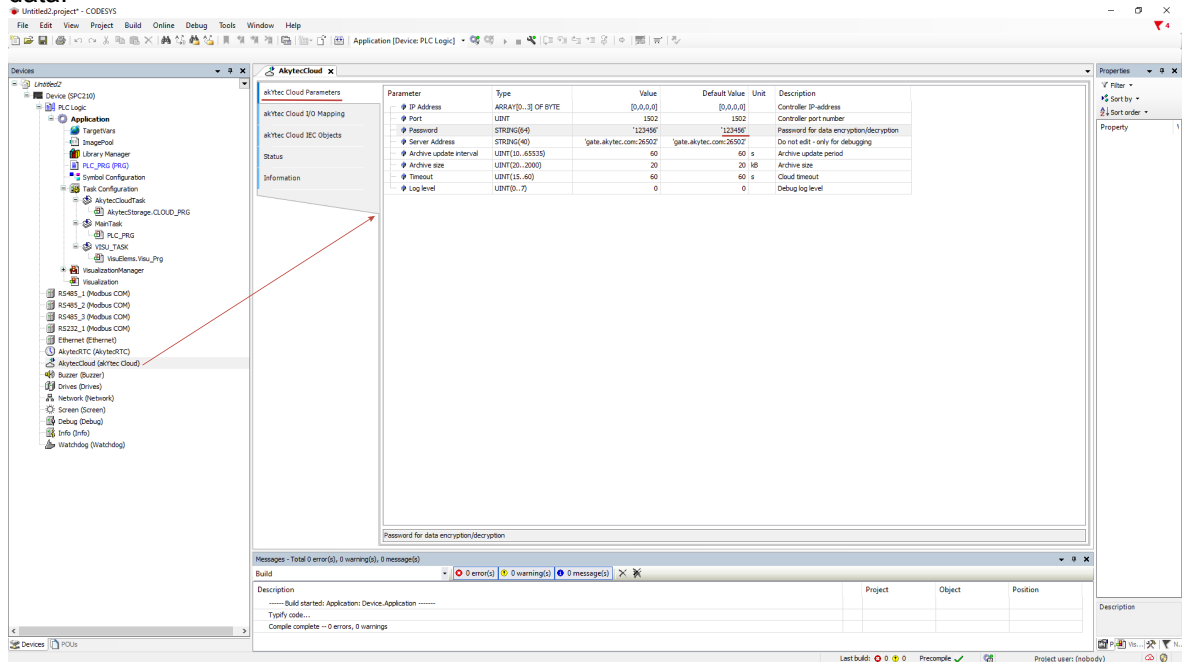
When adding new variables to a project, you must first compile the project to make changes to the symbol configuration.

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

- read only;
- write only;
- read and write.



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

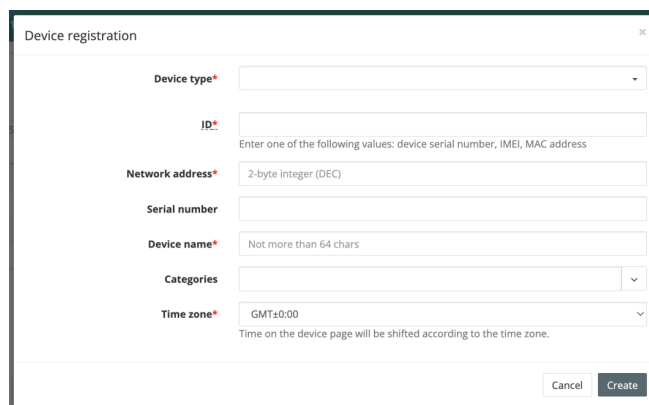


This password is used when adding the device to akYtec Cloud. Connect to the controller and load the project into the controller.

### Adding the device to akYtec Cloud

Open your browser and type in <https://cloud.akytec.de/>. Log in. The main akYtec Cloud window will open.

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



Device registration

Device type\*

ID\*

Enter one of the following values: device serial number, IMEI, MAC address

Network address\*

2-byte integer (DEC)

Serial number

Device name\*

Not more than 64 chars

Categories

Time zone\*

GMT+0:00

Time on the device page will be shifted according to the time zone.

Cancel Create

**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 variable of STRING type 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.

Select **Basic settings / General setting** in the device settings. A window will open:

Basic settings
Events settings
Parameters settings

General settings
Map location

Current identifier

Device type

New ID

Device name\*

Categories

Time zone\*

GMT+1:00

▼

Time on the device page will be shifted according to the time zone.

Log retention period\*

90

days

Not more than 90 days

"Operative" period\*

60

sec

Operative parameters gathering interval

"Configuration" period\*

70

sec

Configuration parameters gathering interval

"Manageable" period\*

80

sec

Manageable parameters gathering interval

Offline period\*

90

sec

Value must be greater than minimal parameters gathering interval

Serial Speed\*

9600

▼

Serial Setup\*

8N1

▼

Network address\*

2-byte integer (DEC)

Symbol timeout\*

100

ms

Overall timeout\*

100

ms

Modbus protocol\*

RTU

▼

Allow packet read

The system will group requests to neighbor Modbus-registers in one packet


Save

**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. This can take up to a few minutes.

### Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . You will see the main akYtec Cloud window with the **Parameters** tab.

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.

Check that the parameter values have been recorded to the device by clicking on the **Write commands** tab.

Parameters		
Parameters	Tables	Graphs
Events	Parameter record	Configurations
Parameter	Code	Value
└─All parameters		
└─Application		
└─SymbolConf		
└─PLC_PRG		
└─iVar	UID1073741832	11
└─rVar	UID1073741833	22.330
└─xVar	UID1073741834	1

[Export to Excel](#)

**CAUTION**

To enable verification, the list must contain the **manageable**-type parameters.

## Restrictions:

- The number of valid controller parameters imported into akYtec Cloud is limited to 1000. If this value is exceeded, some of the 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 3.5b will be **TRUE**.
- The number of folders in the configuration is limited to 100. If this value 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 **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 set in the controller.

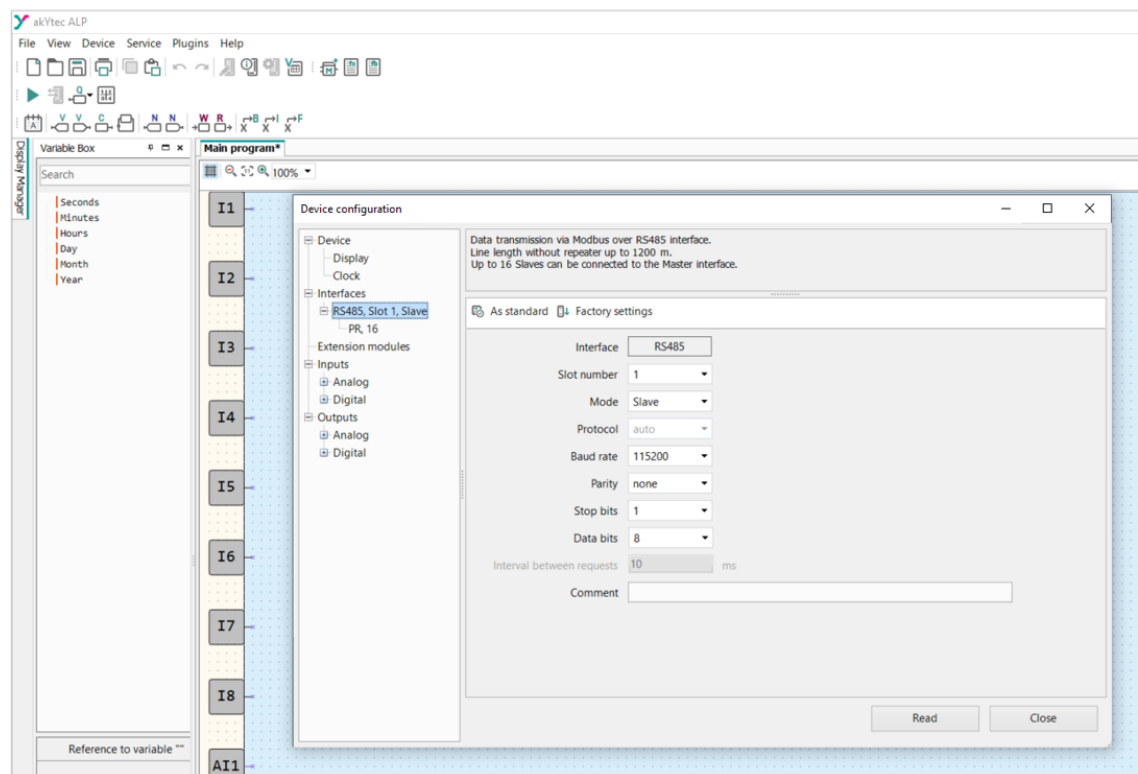
## 18 Programmable relay connection

### 18 Programmable relay connection

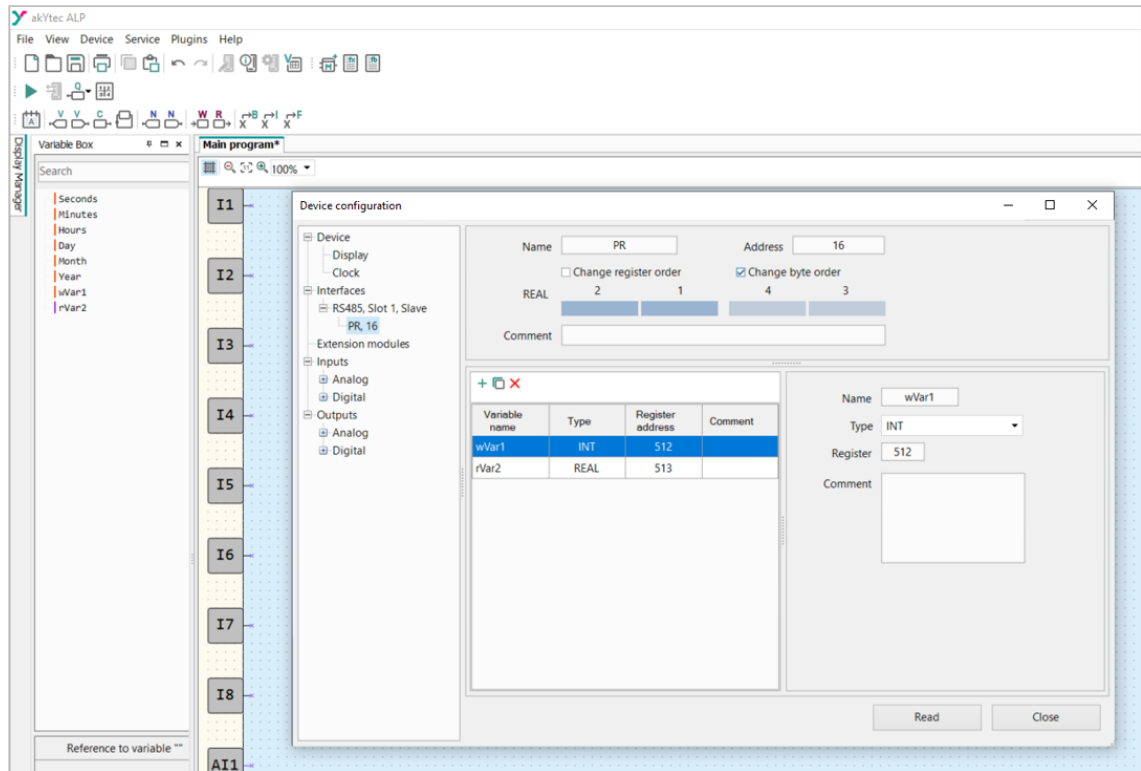
Connection of PR200 programmable relays with the RS485 interface.

#### 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.



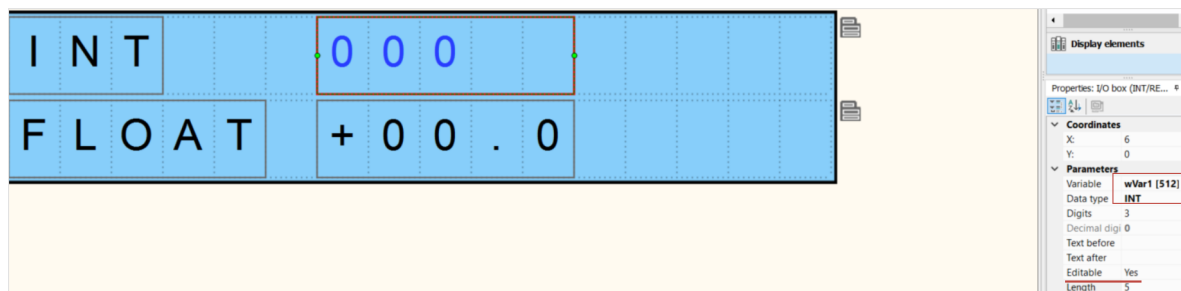
2. Add the following network variables to the register map:



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, 513-514).

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 them.



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

### Adding a device and gateway to akYtec Cloud

Open your browser and type in <https://cloud.akytec.de/>. Log in. The main akYtec Cloud window will open.

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



Device registration ✕

**Device type\***

**ID\***   
Enter one of the following values: device serial number, IMEI, MAC address

**Network address\***  2-byte integer (DEC)

**Serial number**

**Device name\***  Not more than 64 chars

**Categories**  ▼

**Time zone\***  GMT±0:00  
Time on the device page will be shifted according to the time zone.

**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.  
Select **Basic settings / General setting** in the device settings. A window will open:

Basic settings Events settings Parameters settings

General settings Map location

**Current identifier**  \*\*\*\*\*

**Device type**  Arbitrary modbus device

**New ID**

**Device name\***  \*\*\*\*\*

**Categories**  ▼

**Time zone\***  GMT+1:00  
Time on the device page will be shifted according to the time zone.

**Log retention period\***  90  days  
Not more than 90 days

**"Operative" period\***  60  sec  
Operative parameters gathering interval

**"Configuration" period\***  70  sec  
Configuration parameters gathering interval

**"Manageable" period\***  80  sec  
Manageable parameters gathering interval

**Offline period\***  90  sec  
Value must be greater than minimal parameters gathering interval

**Serial Speed\***  9600 ▼

**Serial Setup\***  8N1 ▼

**Network address\***  1  
2-byte integer (DEC)

**Symbol timeout\***  100  ms

**Overall timeout\***  100  ms

**Modbus protocol\***  RTU ▼

**Allow packet read**  
The system will group requests to neighbor Modbus-registers in one packet

## 18 Programmable relay connection

- **Serial speed** – set the COM port speed;
- **Serial setup** – select the COM port settings, in the following format:
  - the number of information bits for one byte of data. Possible options: 7, 8;
  - parity mode. Possible options: N - none, E - even, O - odd;
  - stop bits. Possible options: 1, 2.

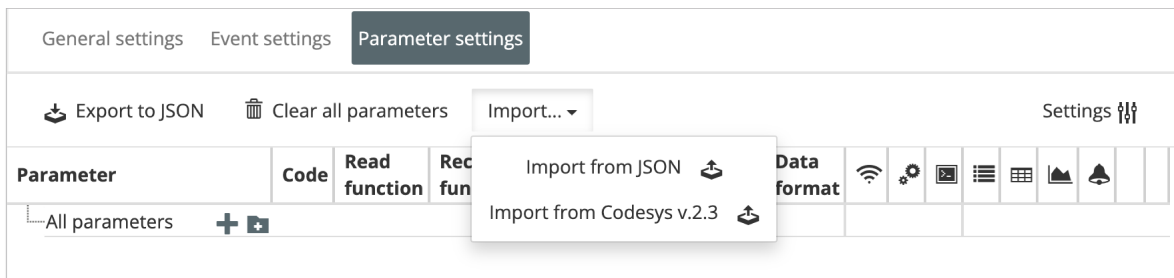
**Example:**

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**.



This will automatically add the PR200 parameters to akYtec Cloud:

Parameter	Code	Read function	Record function	Register address	Unit of measurement	Data format	Wi-Fi	Settings	Grid	Print
All parameters										
Network variables										
rVar	ps13	03	16	201	none: no units	float	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
wVar	ps12	03	16	200	none: no units	uint16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Verifying the data exchange between akYtec Cloud and the device

To view the current values of the device parameters, click . You will see the main akYtec Cloud window with the **Parameters** tab.

Change the variable values from the PR200 display and monitor the corresponding changes in akYtec Cloud.

Check that the parameter values have been recorded to the device by clicking on the **Write commands** tab.

Parameter	Code	Value
All parameters		
Network variables		
rVar	ps13	11.22
wVar	ps12	3

[Export to Excel](#)

**CAUTION**

To enable verification, the list must contain the **manageable**-type parameters.