User manual IQIO IO

Dear Customer

Thank you very much for choosing our product. At the same time, please read this manual carefully before using it, as it indicates the most appropriate ways to handle this appliance, taking into account basic safety and maintenance principles. Please also retain the manual for future reference.

Remember!

The manufacturer will not be held liable for any damage caused by improper use of the device or improper handling, nor for any malfunctions of the controller resulting from improper operation.

Table of contents

1 Introductory information

Before working with the controller, read the User Manual and follow the instructions contained therein!

Description of symbols used in this manual:

Warning	This symbol indicates that it is necessary to read a specific section of the User Manual that contains important information and warnings. Ignoring these warnings may lead to injury or damage to the device.

Tip	Important instructions and information. Observing the texts marked with this sign will facilitate operation.

The screenshots shown in this manual may differ from their actual appearance. Due to the continuous development of the module software, some functions may differ from those described in the manual. The manufacturer is not responsible for any undesired effects resulting from software differences.

2 Guarantee and liability of the manufacturer

Warning	The manufacturer provides a two-year warranty for the device and a post-warranty service for a period of 10 years from the date the device was placed on the market. The warranty covers all defects in materials and workmanship.

The manufacturer undertakes to comply with the guarantee agreement if the following conditions are met:

- all repairs, modifications, extensions and calibrations of the appliance are carried out by the manufacturer or an authorised service centre,
- the mains power supply system complies with the applicable standards,
- the appliance is operated in accordance with the instructions given in this manual,
- the appliance is used in accordance with its intended use.

The manufacturer shall not be held liable for any consequences resulting from incorrect installation, improper use of the device, non-compliance with the operating instructions or repairs carried out by persons not authorised to do so.

Warning	There are no user-serviceable parts inside the appliance.

3 Safety in use

The module was constructed using modern electronic components in line with the latest trends in world electronics. Particular emphasis was placed on ensuring optimum operational safety and control reliability. The unit has a housing made of high-quality plastic.

3.1 Storage, operating and transport conditions

The device should be stored in closed rooms where the atmosphere is free of vapours and corrosive agents and:

- an ambient temperature of -35°C to +65°C,
- humidity between 25% and 90% (no condensation allowed)
- an atmospheric pressure of 700 to 1060hPa.

The unit is designed to operate under the following conditions:

- ambient temperature of -30°C to +60°C,
- humidity between 30% and 75% (no condensation allowed),
- atmospheric pressure of 700 to 1060hPa.

Recommended transport conditions:

- ambient temperature of -40°C to +85°C,
- humidity between 5% and 95% (no condensation allowed),
- atmospheric pressure 700 to 1060hPa.

3.2 Installation and use

The controller should be operated as described in the following section.

3.3 Disposal and decommissioning

In the event that it becomes necessary to dispose of the device (e.g. at the end of its useful life), contact the manufacturer or the manufacturer's representative, who is obliged to respond appropriately, i.e. to collect the device from the user. The user may also contact companies dealing with the disposal and/or decommissioning of electrical or computer equipment. Under no circumstances should the appliance be placed with other waste.

4 Purpose of the device

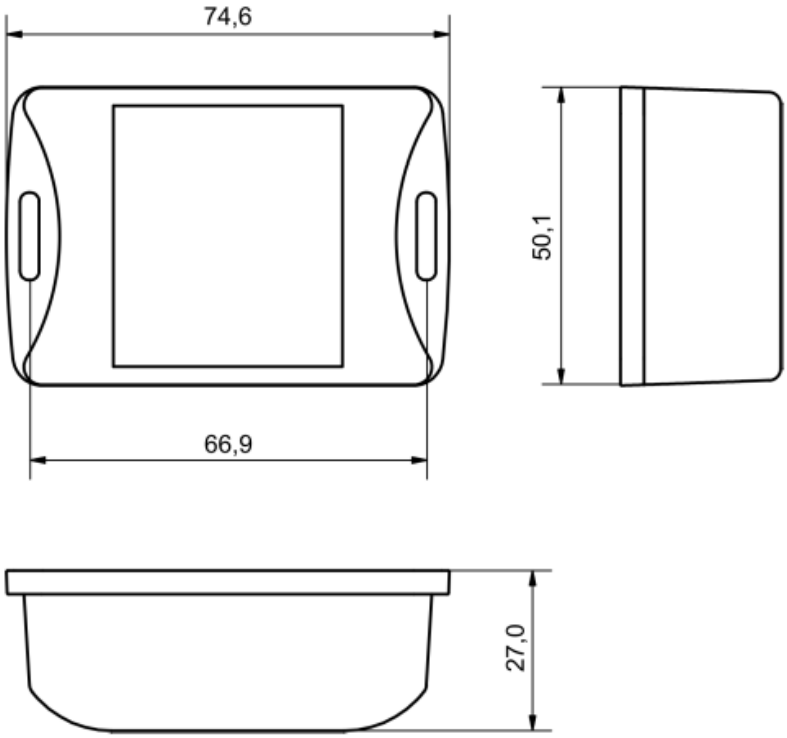
The IQIO IO device is a versatile controller that enables the monitoring, management and control of various devices and processes. In addition to supporting various communication protocols (such as HTTP, MQTT, TCP/UDP) and time synchronisation functions, the IQIO IO also offers support for one input and one output. This means that it can control one input device, for example a temperature or motion sensor, and one output device, for example a relay controlling a light or fan. The ability to configure notifications and the event system make the IQIO IO applicable in various fields such as industrial automation, building management, environmental monitoring and security systems. It is a reliable tool for remote control and process optimisation, meeting the needs of both individual users and businesses.

5 Assembly of the device

5.1 Technical data

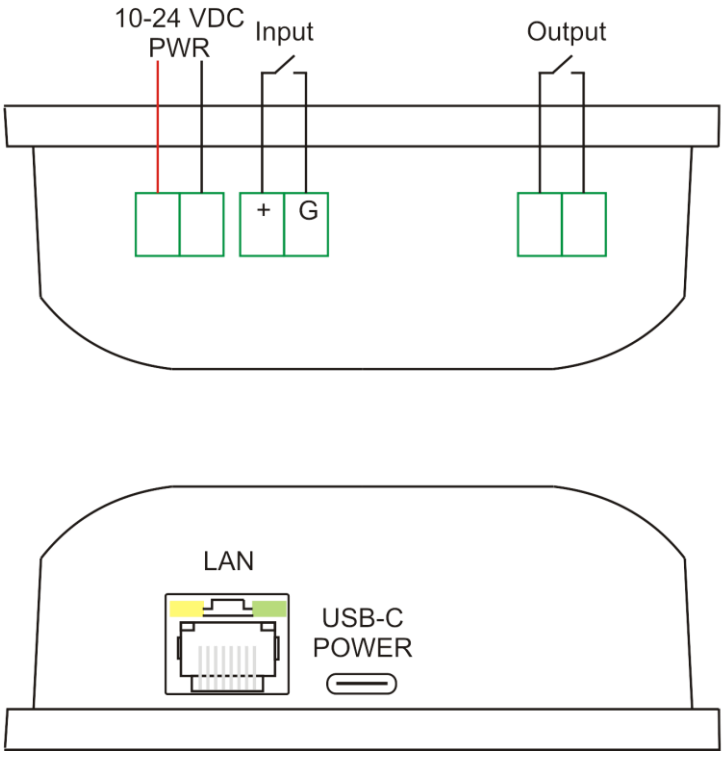
Power supply	Three optional power supply types are available: 1. PoE: 33-57V PoE IEEE 802.3af 2. DC: 12-24VDC (3.5mm screw connector) 3. USB: 5VDC USB C cable
Power consumption	1,5W
Inputs	1 digital input pre-polarised, NO
Outputs	1 relay output potential-free NO max. operating voltage 30VDC max load current 1A NO output (normally open) ON/OFF time 1ms/5ms operating modes: bistable, astable, monostable, timed
Communication	Wi-Fi optional 10/100 Mbps Ethernet port
Display	LED 7-segment, red
Operating temperature	from -10°C to +55°C
Enclosure	Enclosure class: IP30

5.1 Dimensions



5.2 Connection diagram

Diagram of the connection of the sensor to the IQIO device:

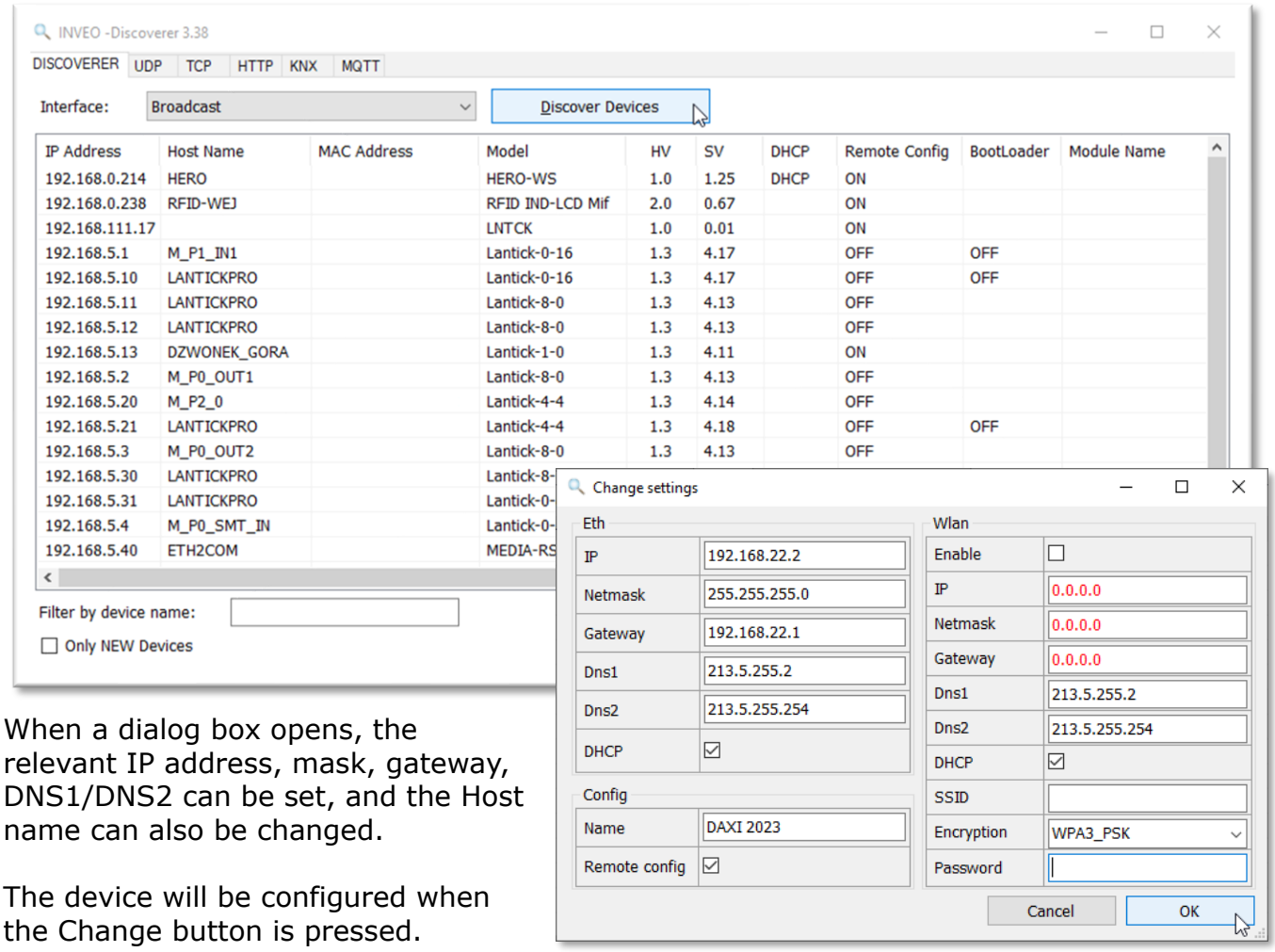


6 Device configuration

On first start-up, it is necessary to configure the device. This can be done in two ways. The simplest method is to use the Discoverer programme from Inveo.

6.1 7.1 Changing the IP address via the Discoverer program

After starting the Discoverer program (available at www.inveo.com.pl) and searching for a suitable device, right-click and then press Change settings.

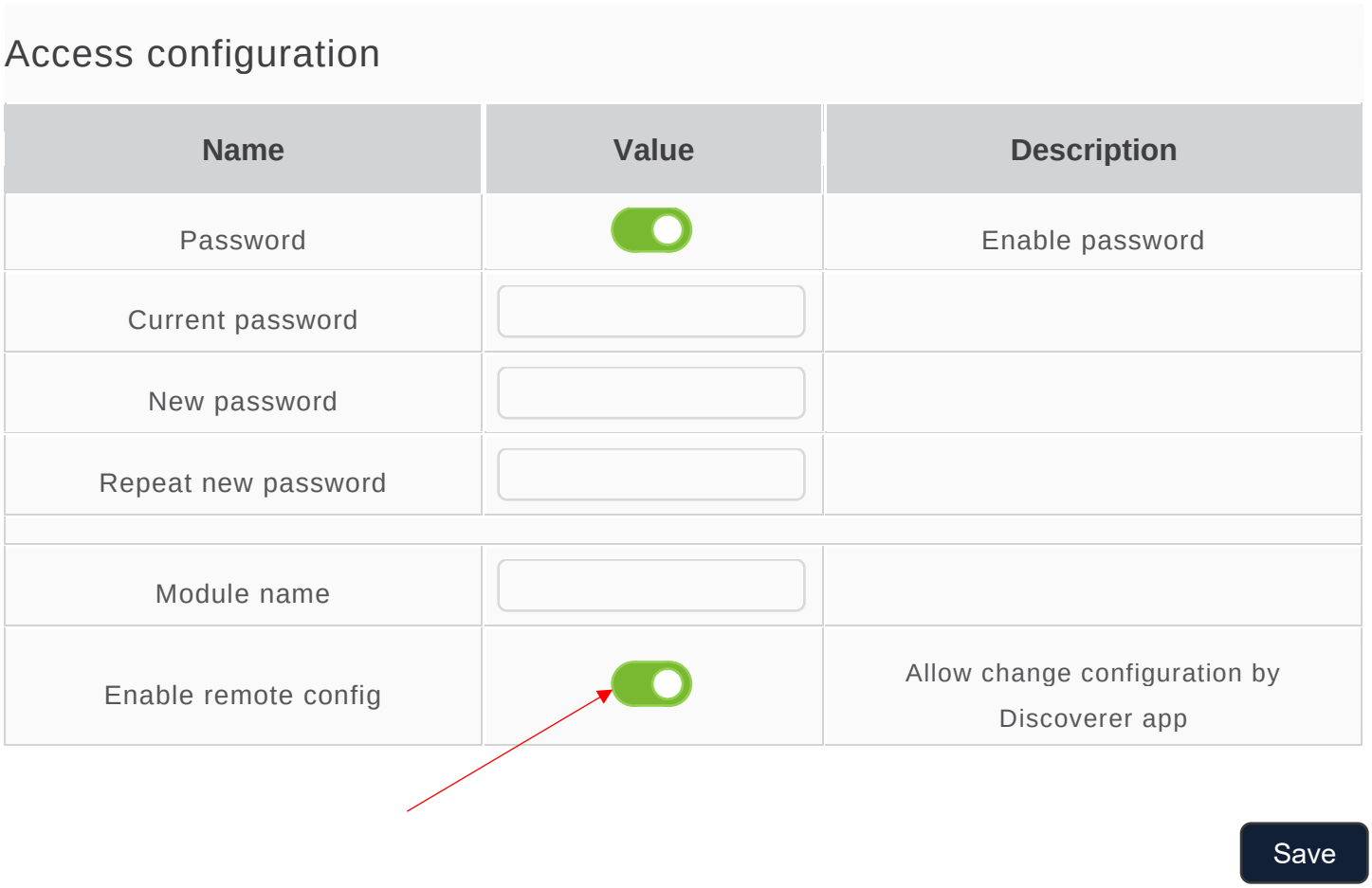


When a dialog box opens, the relevant IP address, mask, gateway, DNS1/DNS2 can be set, and the Host name can also be changed.

The device will be configured when the Change button is pressed.

If Remote Config is disabled (enabled by default), it is necessary to configure the device by changing the subnet of the computer (section 6.2 Changing the subnet of the computer to be configured).

To enable Remote Config, go to the Administration tab, in the Access configuration window select Enable Remote Config.



Then click Save to save the settings.

6.2 Changing the subnet of the computer to be configured

When configuring the device bypassing the Discoverer application, you must first change the subnet address of the computer connected to the same network.
To do this, go to the network configuration of the computer:

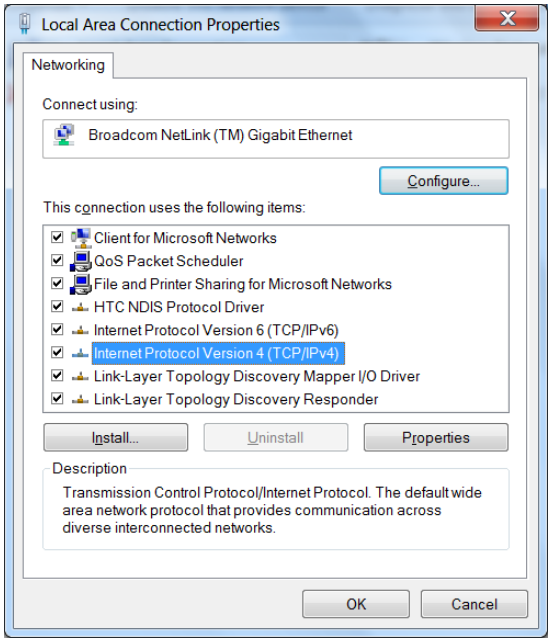
- Press Win + R, type ncpa.cpl and press Enter,

OR

- Start → Control Panel → Network and Internet → Network and Sharing Centre → Change network adapter settings.

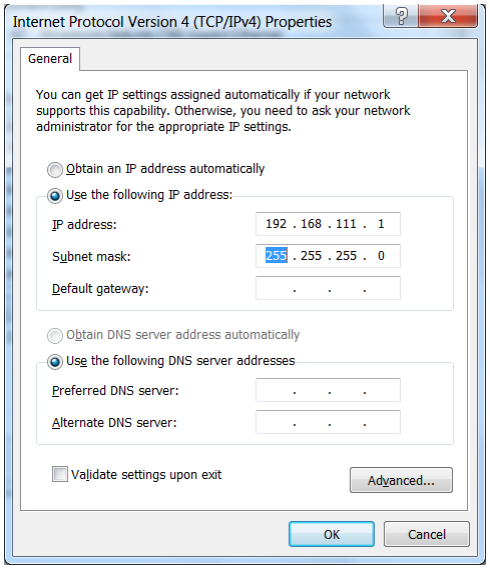
Select your network connection, press the right mouse button and click Properties.

Once selected, the configuration screen will appear:



Changing the network configuration in WINDOWS

Then select the "Internet Protocol (TCP/IP)" setting and enter the following parameters:

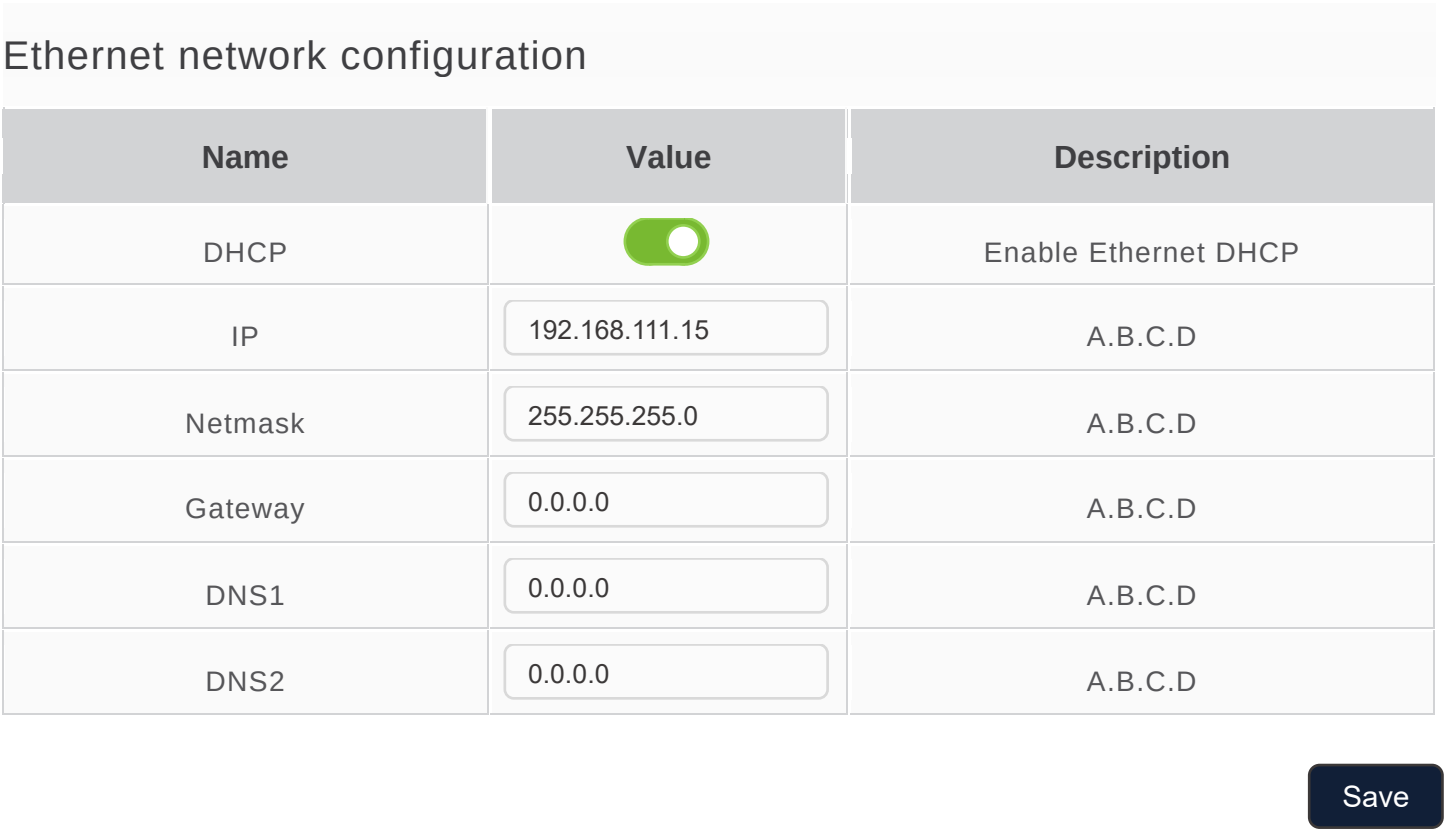


Examples of TCP/IP protocol settings

After accepting the settings with the OK button, start your web browser and enter the address: 192.168.111.15. (Default user and password: admin/admin).

6.3 Configuring network settings

To adjust the network settings of the device, go to the Administration / Network tab. Here it is possible to configure parameters such as IP address, subnet mask, gateway, DNS and other network-specific options. This tab enables both wired network configuration (Ethernet network configuration section) and wireless network configuration (WLAN network configuration section).



- **DHCP** – enabling/disabling the DHCP server function,
- **IP** – device IP address,
- **Netmask** – IP subnet mask,
- **Gateway** – network gateway,
- ***DNS1, DNS2*** – DNS server addresses

WLAN network configuration

Name	Value	Description
Wi-Fi		Enable Wi-Fi
DHCP		Enable Wi-Fi DHCP
IP	192.168.111.15	A.B.C.D
Netmask	255.255.255.0	A.B.C.D
Gateway	0.0.0.0	A.B.C.D
DNS1	0.0.0.0	A.B.C.D
DNS2	0.0.0.0	A.B.C.D
Encryption	Open	Select Wi-Fi encryption
SSID		Wi-Fi SSID
Password		Wi-Fi password

Scan available Wi-Fi

Save

- **Wi-Fi** - Enable / disable Wi-Fi wireless network support,
- **DHCP** - Enable/Disable DHCP server function in Wi-Fi network, DHCP - Enable/Disable DHCP server function in Wi-Fi network,
- **IP** - device IP address,
- **Netmask** - IP subnet mask,
- **Gateway** - network gateway,
- **DNS1, DNS2** - DNS server addresses,
- **Encryption** - selection of Wi-Fi encryption type:
  - Open
  - WEP
  - WPA-PSK
  - WPA2_PSK
  - WPA_WPA2_PSK
  - WPA3_PSK
- **SSID** - the name of your network,
- **Password** - the password for accessing the Wi-Fi network.

The button Scan available Wi-Fi allows you to search for and display available Wi-Fi wireless networks within the range of the device.

6.4 Configuration mode

Pressing and holding the RESET button will display the IP address.

Configuration Mode – for 3 minutes after power is applied, the unit is in a state where it is possible to change or view some settings. Pressing and holding the RESET button during this time will sequentially display:

- **IP** the current IP address of the device,
- **dhcp eth** – if the RESET button is released at this time, the DHCP function will be disabled / enabled,
- **AP** – releasing the RESET button at the moment when this caption is displayed will enable the configuration of WiFi on the device - see section 6.5 Instructions for setting up the WiFi connection ,
- **rst def** – releasing the button while this text is displayed will restore the device to factory settings.

If the RESET button is released during the interval between subtitles or after the last subtitle is displayed - no changes will be made.

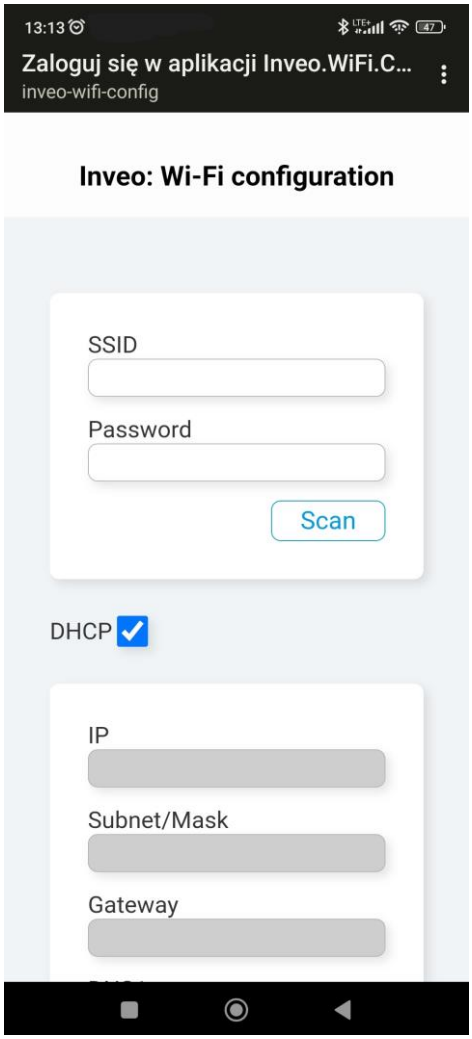
6.5 Instructions for setting up the WiFi connection

Step 1. For three minutes after the device has been powered up (during Configuration Mode, see section 6.4 Configuration mode) it is possible to configure the WiFi connection. To do this, press and hold the "RESET" button until "AP" appears on the device display.

Step 2. Turn on the search for available Wi-Fi networks on your phone or other device. A network named "Inveo-wifi-config" should appear.

Step 3. A network named "Inveo-wifi-config" will appear - connect to it.

Step 4. When the connection is established, press the 'scan' button in the configuration interface or enter the WiFi SSID name in the SSID field.



Step 5. Select the network from the list of available ones to which the device is to be connected.

Step 6. Enter the appropriate password for the selected network.

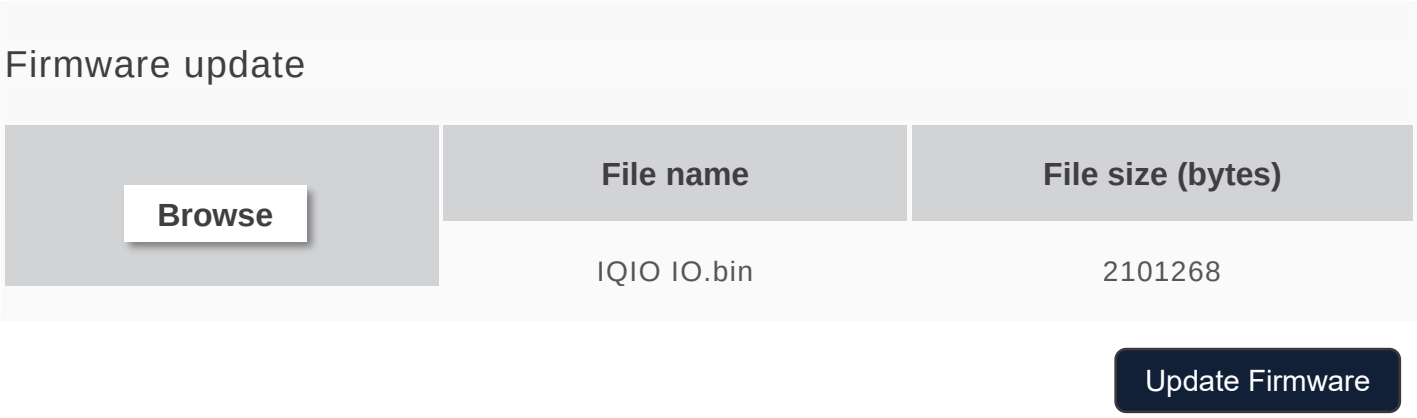
Step 7. If the DHCP server is not available, you can configure the network settings manually after unchecking the "DHCP" option.

Step 8. If the settings are successfully saved, this "SUCCESS" message will appear.

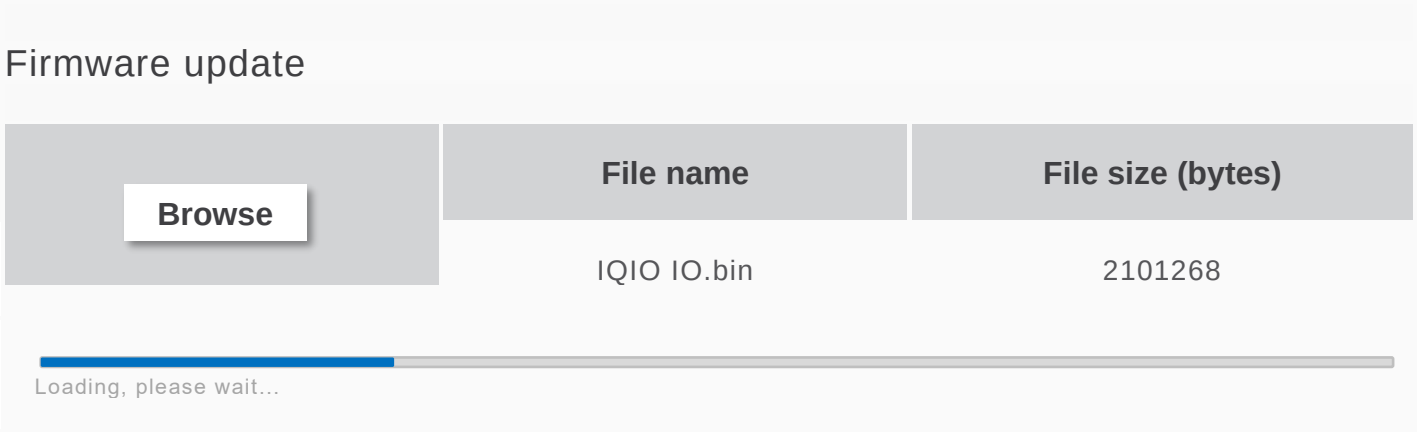
7 Software update

The DAXI device is equipped with a software update facility. The software is supplied as a file with the extension .bin.
To update the software, please follow the following steps:

Step 1. Go to the device's web page to the Administration/Update tab.
Step 2. Using the "Browse" button, locate the previously saved software file on your device.



Step 3. Step 3. Once you have selected the correct file, press the "Update Firmware" button. The progress of the update can be seen.

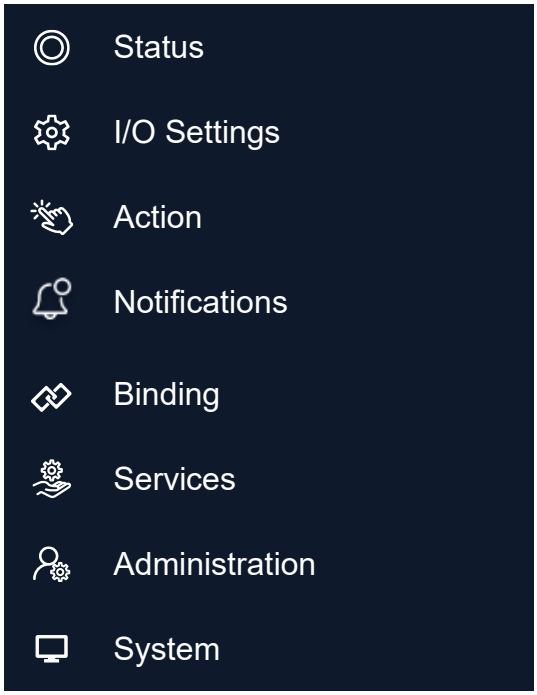


Step 4. Step 4. Once the update is complete, the screen will display the message "Firmware updated, rebooting...". (Firmware has been updated, rebooting takes place). The device will automatically reboot.

8 Appliance website

The web page interface of the DAXI appliance enables intuitive and advanced management of the device. After entering the device's IP into the browser, a page opens allowing full configuration and customisation of the device's operating parameters according to the individual user's needs.

On the left-hand side of the screen is a list of tabs for quick access to various functions and settings. Available tabs:

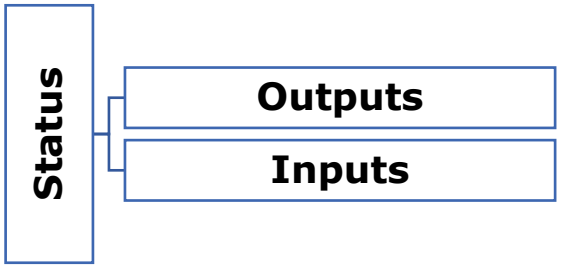


An information bar at the top of the page presents itself, providing key data about the device, such as the name, unique name given by the user, model, IP address, software number and MAC address.

With this website, the user can modify settings, configure parameters and monitor the performance of the device in real time. The DAXI website is a central point of control, enabling the device to be effectively managed and adapted to the user's changing needs.

9 Device status overview (Status)

In the Status tab you can find all information about the currently operated outputs, inputs, sensor readings etc.



9.1 Outputs window

The window displays the current status of the outputs supported by the DAXI device, as defined in the I/O Settings tab. The individual columns of the table with the outputs data can be found:

- **Name** - the name of the output (assigned by the user on the I/O Settings tab). If the output status depends on other factors, the relevant information is displayed under its name:
  - **output unavailable** - assigned to the shutter - output is assigned to the shutter control,
  - **output unavailable** - output is routed - output reflecting the state of e.g.: an input, another output, etc., see Binding
- **Off/On** - current state of the output, pressing the left mouse button in this area will change the state of the output - this option enables manual control of the output,
- **Coil state** - current status of the relay coil - green colour means the relay is on.

The activation of the output (visible in the Off/On column in the table) is not always the same as the coil state (visible in the Coil state column in the table).

Example:
If the output is configured in astable mode, with Time on and Time off parameters, switching the output on in the Status tab will result in a change of state in the Off/On column. On the other hand, the state of the coil will be reflected in the Coil state column. In this case, we can observe the coil state of the relay being alternately signalled as on / off, according to the Time on / Time off parameters set.

Tips

If an output is configured to control roller shutters or is programmed to reflect the status of another output or input - it cannot be tested in the Off/On column.

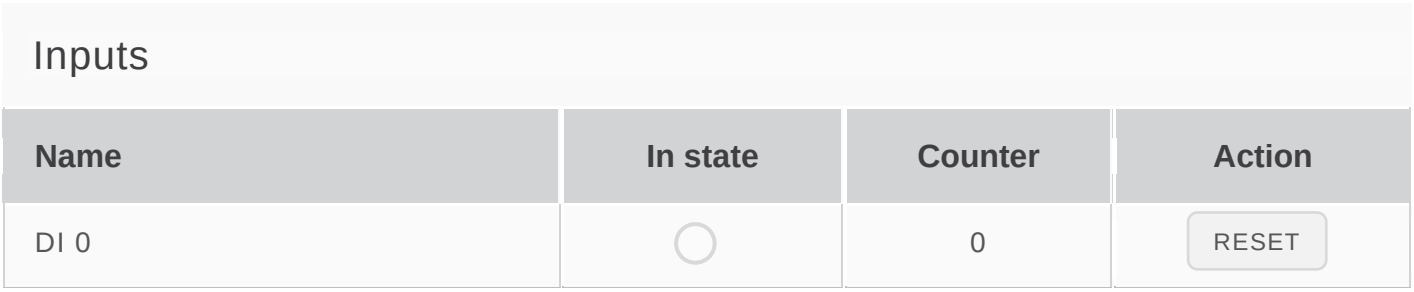
Outputs

Name	Off/On	Coil state
DO 0		

9.2 Inputs window

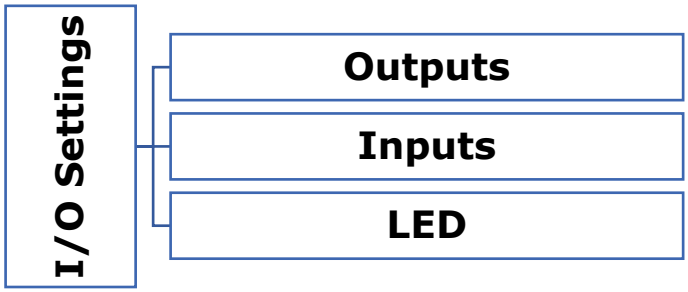
The window displays the current status of the inputs supported by the DAXI device, as defined in the I/O Settings tab. The individual columns of the table with the output data can be found:

- **Name** – name of the input (editable on the I/O Settings tab)
- **In state** – the state of the input
- **Counter** – counter, displaying information on the number of inputs activated since the last reset,
- **Action** – RESET button enables the counter to be reset.



10 Configuring inputs/outputs (I/O Settings)

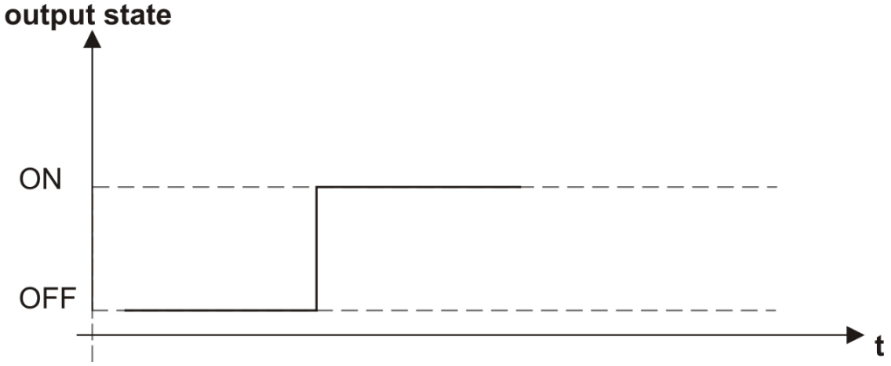
In the I/O Settings tab, you have access to advanced configuration options that allow you to define the exact operation of the device. Here you can specify precisely how the individual inputs and outputs will behave. In addition, for those who wish to customise the way data is presented, this tab also gives you the option to configure the display.



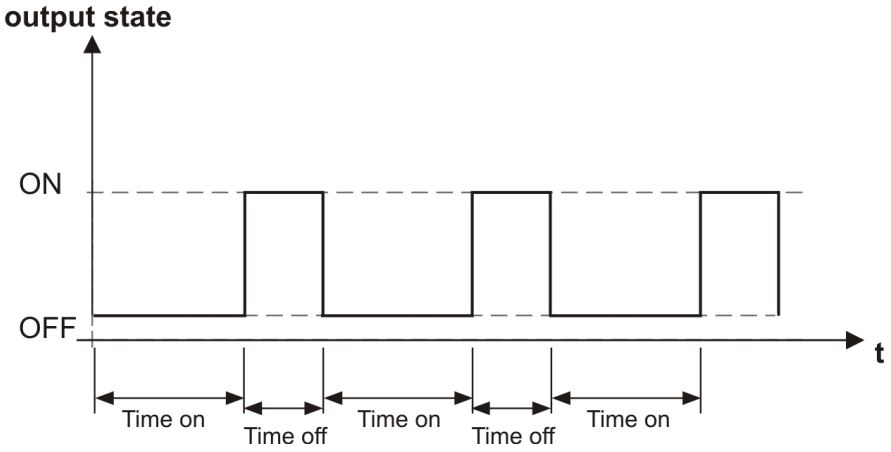
10.1 Outputs

This tab allows the configuration of the outputs supported by the DAXI device - both physical and virtual. The following settings can be changed in the individual columns:

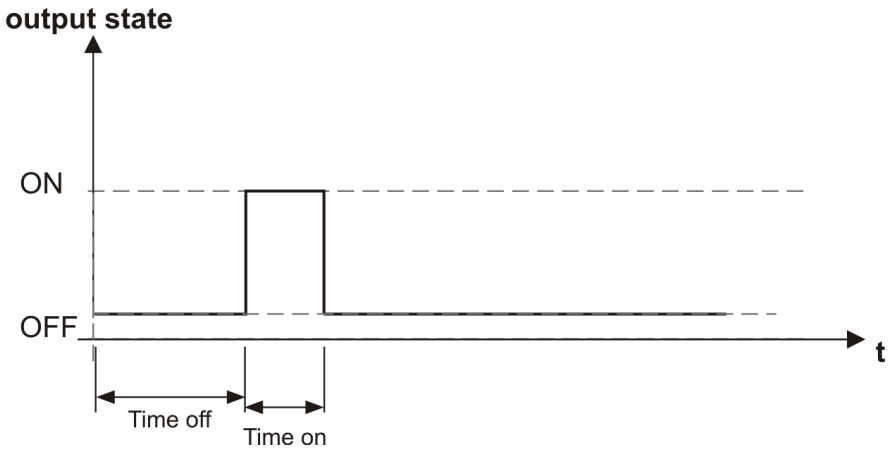
- **Name** – the field allows you to change the name of the output,
- **Mode** – operation mode of the output:
  - **Disable** – disable operation of the output,
  - **Bistabile** – bistable mode,



- **Astable** – cyclic mode - the output is switched on at defined intervals (parameter Time on) for a defined period of time (parameter Time off),



- **One-pulse** – the output is switched on once for a defined period of time (parameter Time on) after a defined time (parameter Time off),



- **Invert** – changing the base state of the output channel,
- **Time on** – time of switching on the output (parameter used in Astable and One-pulse mode),
- **Time off** – output switching off time (parameter used in Astable and One-pulse mode),

Physical outputs configuration

No.	Name	Mode	Invert	Time on	Time off
0	DO 0	Bistable	Standard	0	0

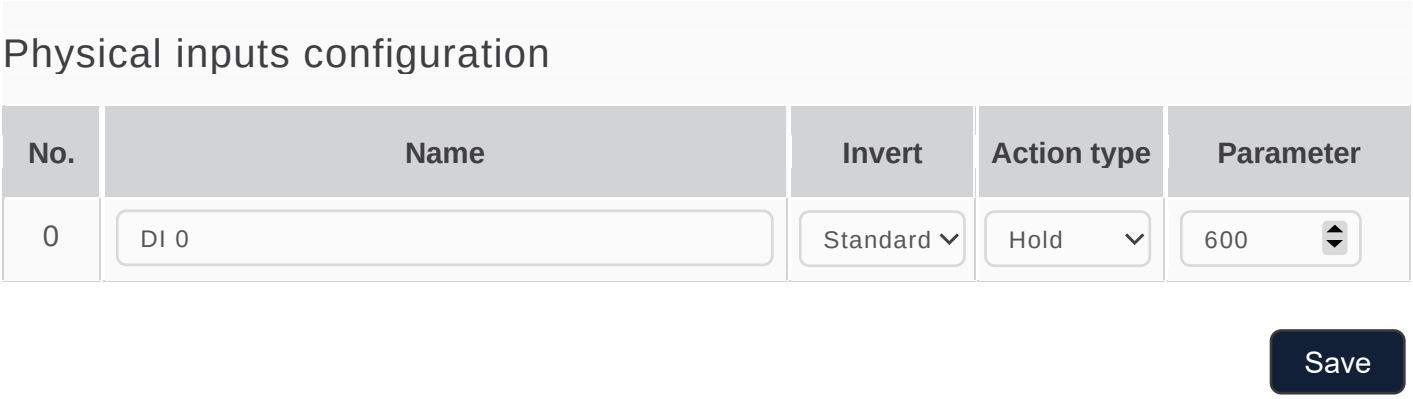
Save

10.2 Inputs

This tab allows the configuration of the inputs supported by the DAXI device - both physical and virtual. The following settings can be changed in the individual columns:

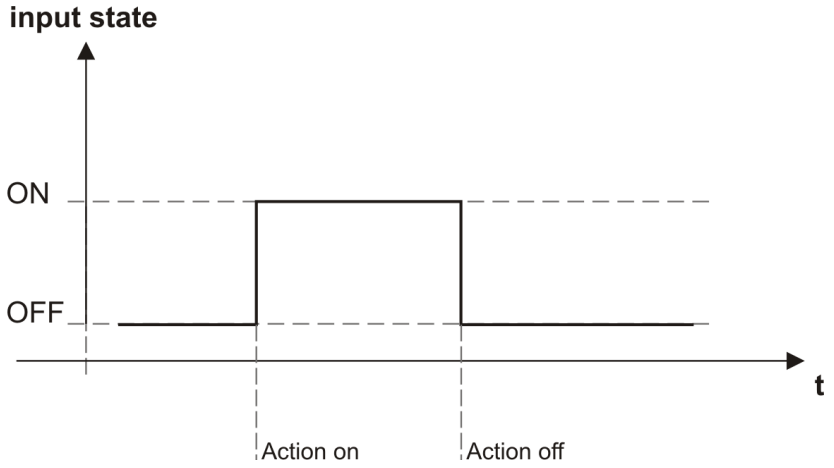
- **Name** - a field allows the name of the input to be changed,
- **Invert** - changing the base state of the input channel,
- **Action type** - mode of triggering the action assigned to the input:
  - **Standard,**
  - **Hold,**
  - **Cnt,**
  - **Toggle,**
  - **Freq,**
- **Parameter** - the value used in the various action activation schemes. When the mouse cursor is placed over the input field, the unit in which the parameter is represented appears, for example Hz for the Freq type.

The button Go to the input actions in the top right-hand corner allows quick access to the Action/Inputs tab, see section 11.2 Inputs.



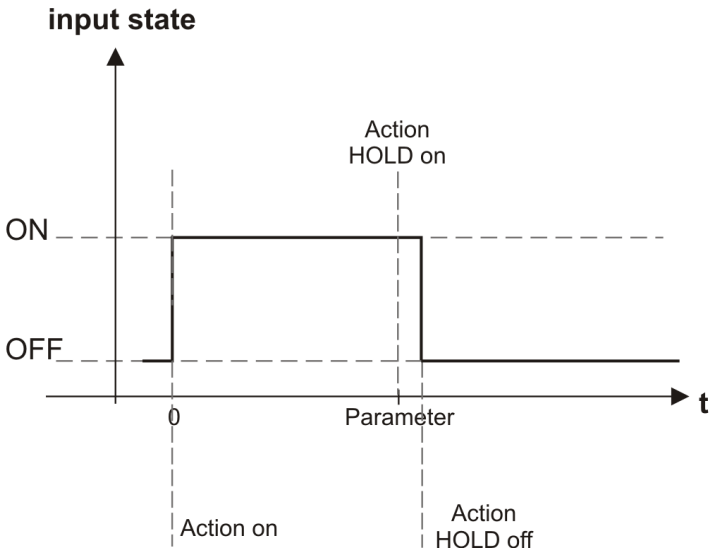
10.2.1 Types of action: Standard

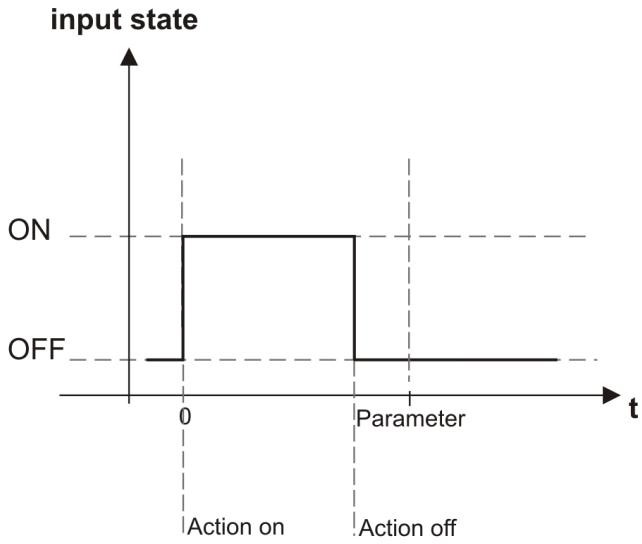
The action is triggered by switching the input on/off.



10.2.2 Action types: Hold

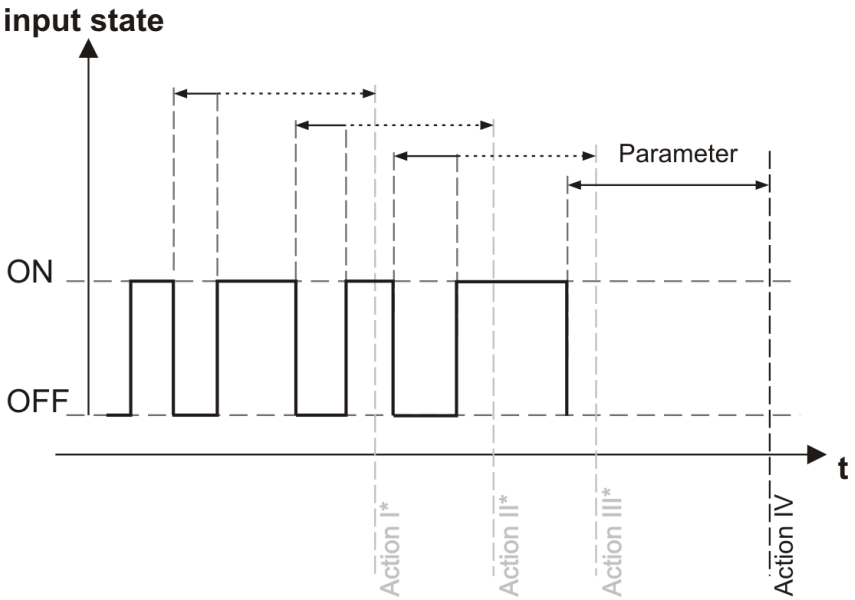
The triggering of a specific action depends on the length of the input pulse. A pulse at the input triggers an event described as Action on. If the pulse continues and exceeds the time specified in the Parameter field - the action described as Action Hold on is triggered. If the pulse is interrupted before the time specified in the Parameter field expires - Action off is triggered. If the pulse is interrupted after the time specified in the Parameter field - the action described as Action hold off is called.





10.2.3 Action types: Cnt

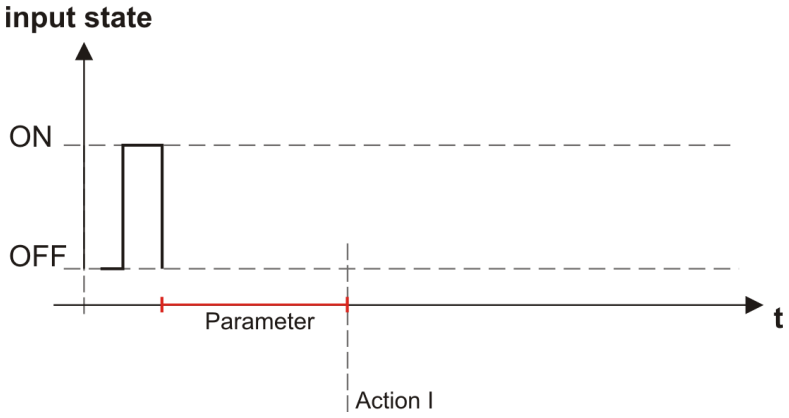
Pulse counter in a specific time interval - the action is triggered by a specific number of activations occurring within the time interval defined in the Parameter field,



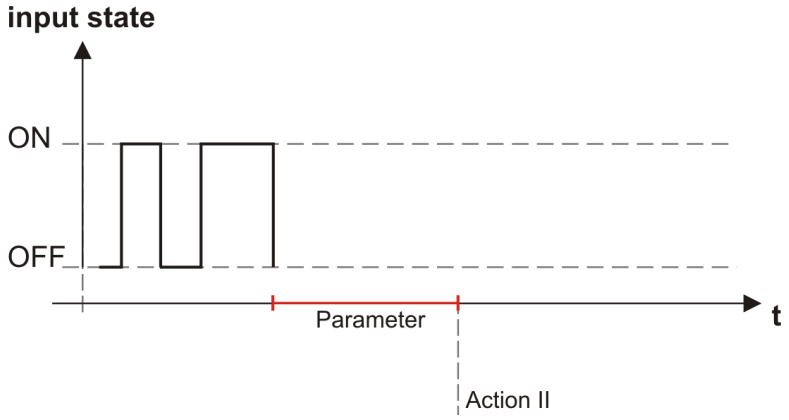
*the action is triggered only if no further impulses occur within the defined time interval (value entered in the Parameter field) (input is not switched on again).

The specified action is triggered when the time - the delay time from the end of the input pulse (e.g.: release of the switch) - has elapsed. If a new event (another pulse) occurs during this delay, the countdown of the delay is interrupted.

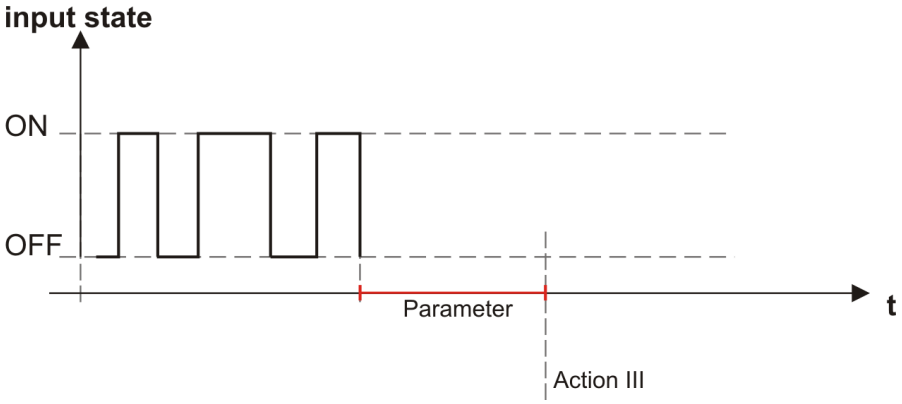
Call to action I:



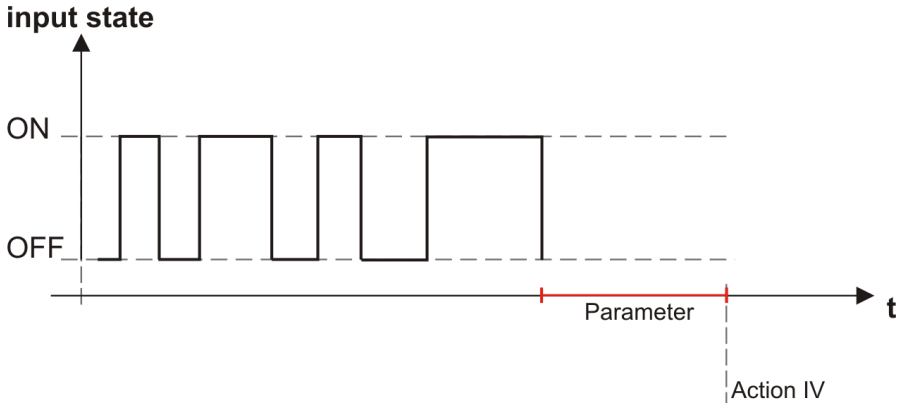
Call to action II:



Call to action III:

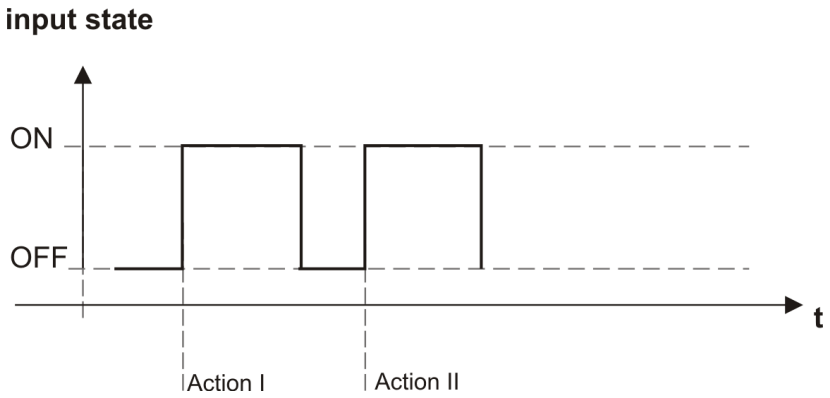


Call to action IV:



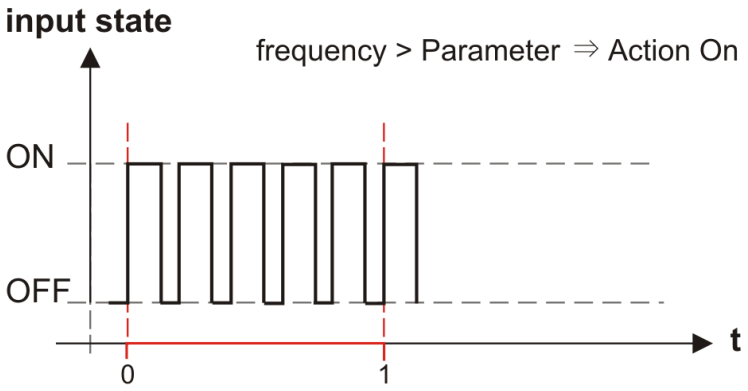
10.2.4 Action types: Toggle

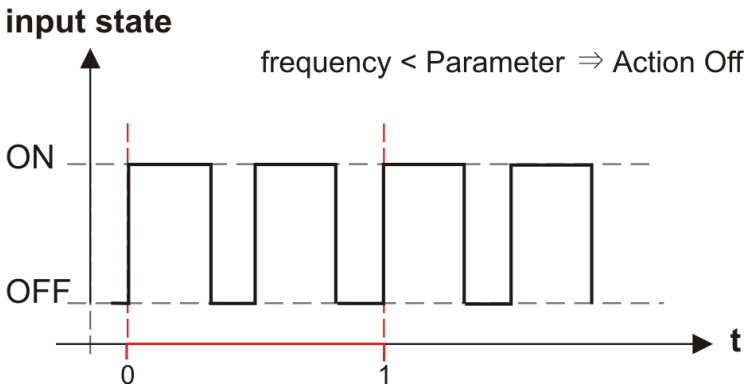
Successive pulses on the input trigger Action I / Action II alternately.



10.2.5 Action types: Freq

The triggering of an action depends on the frequency of the input pulses. The value of the desired frequency must be entered in the Parameter field - expressed in Hz.

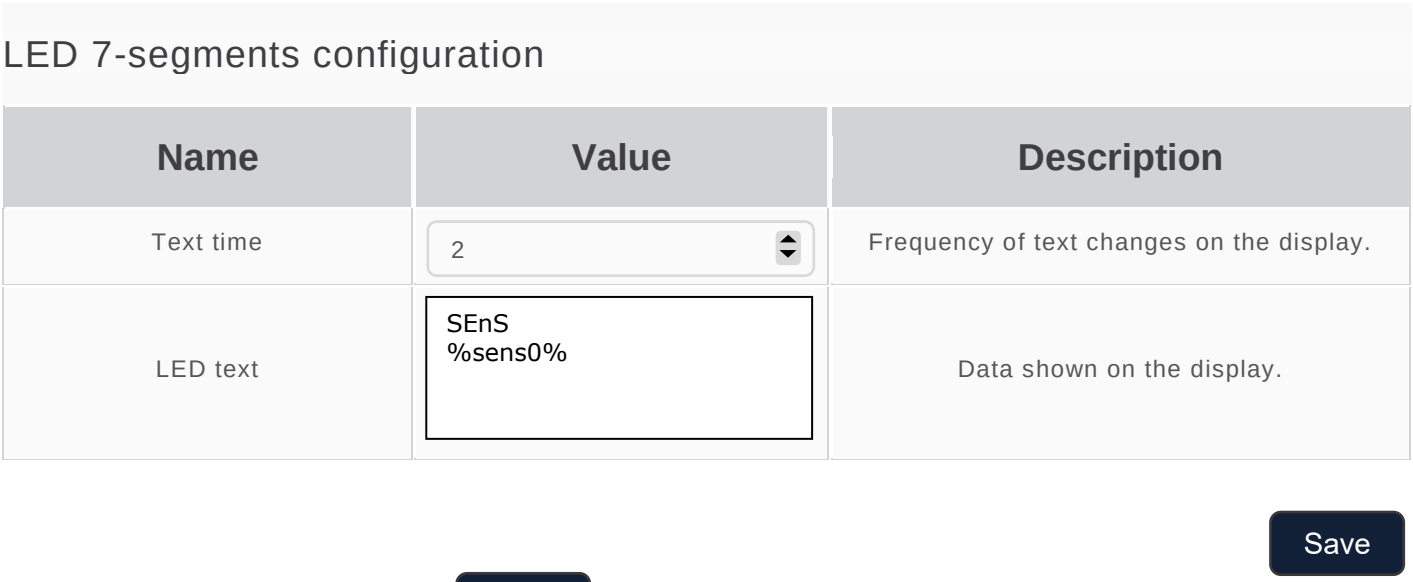




10.3 Display LED

In this tab, the display settings can be configured.

- Test time – frequency of text changes on the display - expressed in seconds,
- LED text – data displayed on the main screen, you can use the built-in variables described in detail in chapter 17 Built-in variables.



Confirm the settings using the Save .

10.4 ⟶ IO control via various communication protocols

The user has the possibility to control the outputs of the DAXI device using different protocols such as HTTP, TCP, UDP and MQTT.

The following commands are available for the outputs from the different protocols (HTTP, UDP/TCP, MQTT):

- out_on=ch - enable output numbered "ch".
- out_off=ch - switch off the output with the number "ch".
- out_inv=ch - changing the state of the output numbered 'ch' to the opposite.
- out_blink=ch,tone,toff,cnt - programming cyclic control of the output numbered "ch". Parameters:
  - ton - on time (expressed in seconds).
  - toff - off time (expressed in seconds).
  - cnt - number of switch-on cycles (optional parameter).
- out_time=ch,tone,toff - switch on the output number "ch" for the time specified in the tone parameter, after the time specified in the toff parameter. The toff parameter is not mandatory - omitting this parameter will switch on the output without delay.
- out_all=10n-11100 - command defining the status of all available outputs. Each digit represents another output:
  - 1 - on.
  - 0 - off.
  - n - change of state to the opposite.
  - - - no change of state.

Example: out_all=10n-1110 will switch on outputs number 0, 4,5,6; switch off outputs 1 and 7; change the state to the opposite of output 2; leave the state of output number 3 unchanged.

Commands can be combined with the & sign.

Example:
out_on=2&out_inv=3&out_time=1,20,20

Controlling the outputs via the HTTP protocol
In order to control the outputs using the listed commands, the io resource must be referenced. Example:
http://192.168.111.14/io?out_inv=2&out_inv=3.
The address contains: the IP of the device, the "io" resource and the selected commands, combined using "&".
Attachment of HTTP support and detailed configuration is available under Services / HTTPc - see section 14.2 HTTPc.

Output control via UDP, TCP protocols
Commands can also be used in the TCP and UDP protocols.
Server services and ports for TCP/UDP can be enabled under Services / TCP/UDP - see chapter 14.5 TCP/UDP.

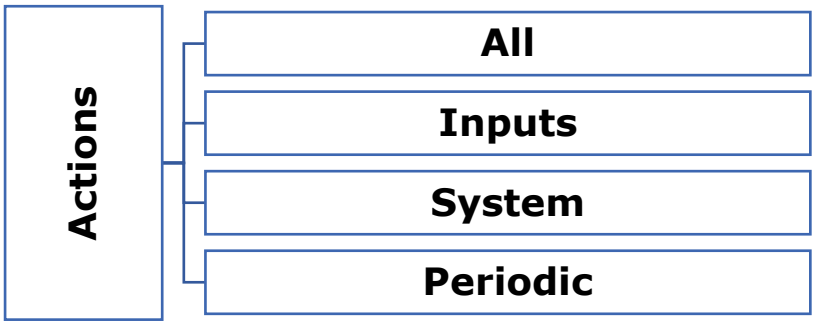
Output control via MQTT protocol
It is possible to use the above commands in communications using the MQTT protocol. After enabling the MQTT service on the device, it is necessary to specify the address of the broker, the port on which the broker listens and to specify the subscribe topic on which the device will listen.
Enabling MQTT support and detailed configuration is available under Services / MQTT - see section 14.3 MQTT.

11 Defining tasks (Action)

DAXI actions are user-defined actions that the device takes in response to specific signals or sensor readings. They can include:

- Output control: activating or deactivating a specific output based on a sensor reading. For example, activating a fan when the temperature value exceeds a certain threshold.
- Sending notifications in the form of SMS, e-mail, MQTT frame, HTTP, TCP, UDP, or SNMP trap and others. More specifically: automatic sending of an alert or message to the user or another system in response to specific conditions.
- Other user-defined actions: actions specific to a particular system or need, such as writing data to a database, activating an alarm, changing the settings of other devices, etc.

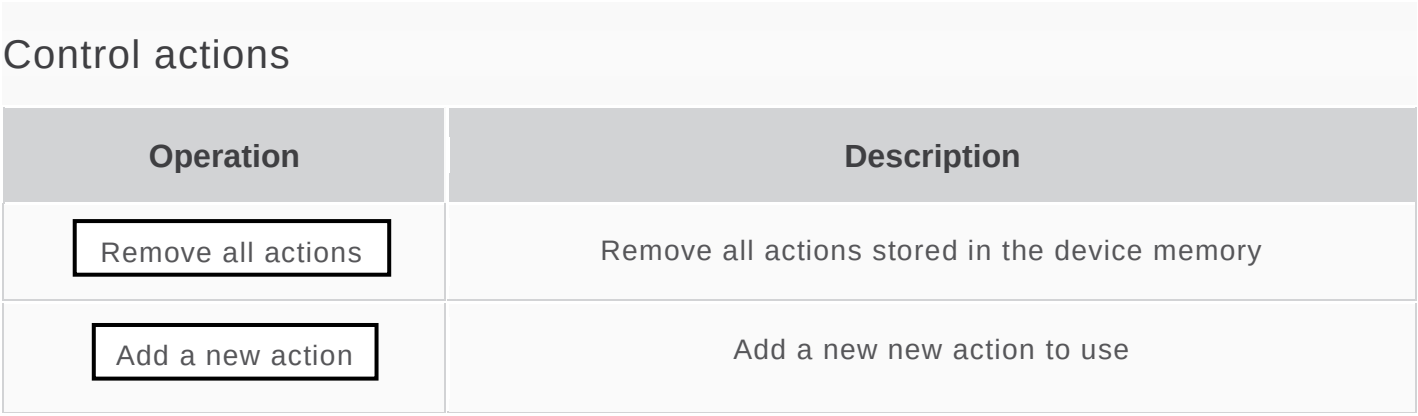
Actions are specific reactions of the DAXI device to received signals and input data, acting according to instructions set by the user. Many functions can be carried out in a number of different methods, depending on your preferences and needs.



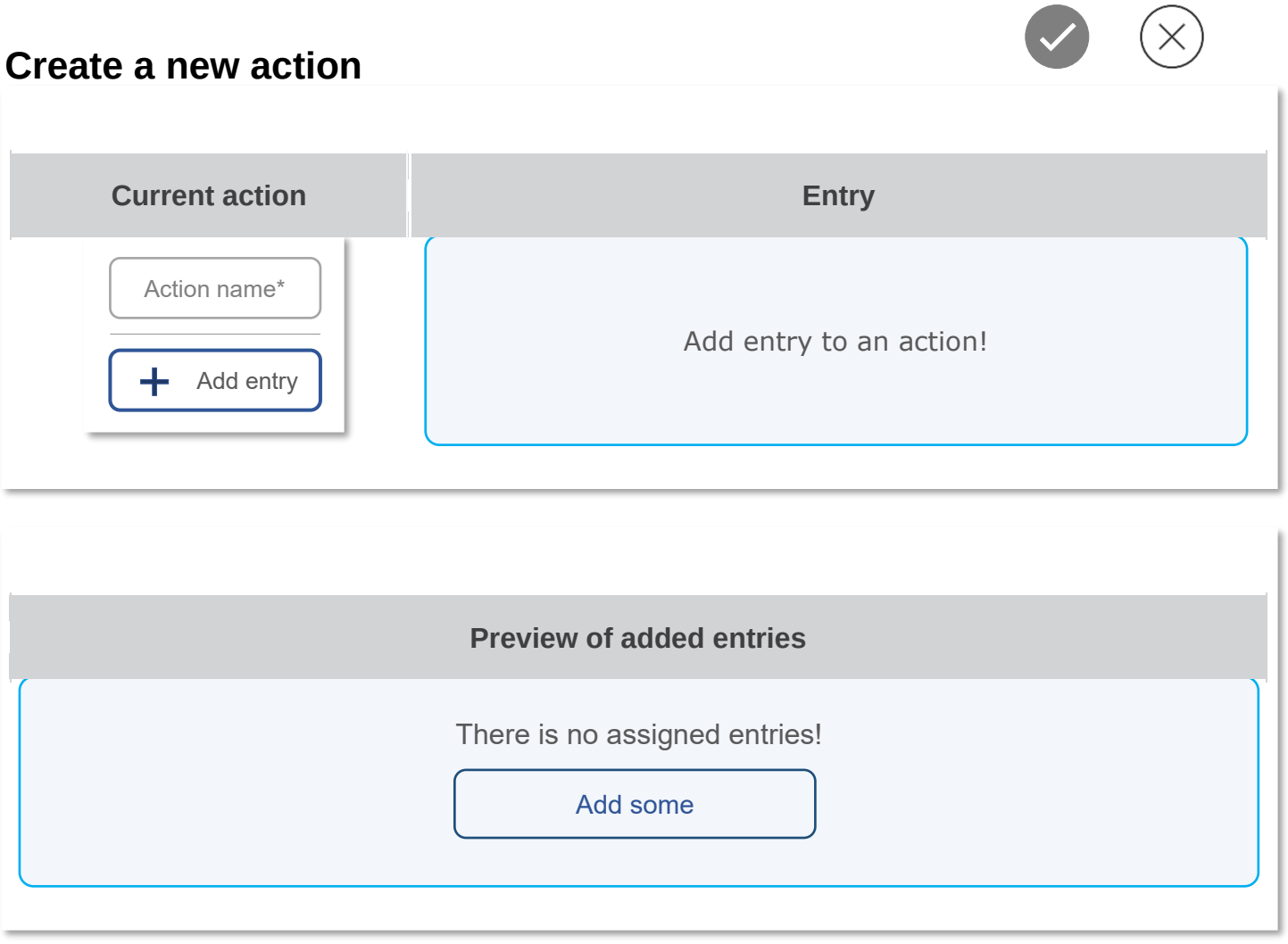
11.1 All

This tab allows you to view and manage the defined actions supported by the DAXI device.

11.1.1 Okno Control Actions



- **Remove all actions** – this button allows you to remove all actions defined on the device,
- **Add a new action** – button enables adding new actions. After clicking on the button, a window is displayed, which allows defining particular parameters of the added action:



Action name – a field in which to enter the assigned name of the action,

Pressing the button 

will enable the selection of the communication protocol and further configuration.

Protocol	Available options	Description
KNX	Input KNX destination group	KNX target group
	Input KNX frame	Content of the KNX frame
UDP	Input server IP	target IP address
	Input server port	port on which the target device listens
	Input data	command sent to target device
TCP	Input server IP	target IP address
	Input server port	port on which the target device is listening on
	Input data	command sent to target device
HTTP*	Input server IP/URL address	target IP address/URL
	Select method	choice of communication method: GET, POST, PUT or DELETE
	Select content-type	choice of content type: Text/plain, application/json, application/xml
	Input data	command to be sent to the target device
MQTT*	Input MQTT topic	topic to which device sends data
	Input data	
IO	Input command	command field, list of supported commands - see chapter 18 IO commands
Internal log	Input log message	message body
E-mail*	Input e-mail receiver	target e-mail address
	Input e-mail message	content of e-mail message
SMS*	SMS sender	sender of the SMS message
	Receivers (comma separated)	recipients of the SMS message
	Input SMS message	content of the SMS message
SNMP Trap	Trap syntax	syntax of the notification sent

*For detailed configuration of communication via protocols, please refer to the Services tab - see chapter 18 System administration (Administration)

After configuring the details of the action to be programmed, press the button 

. It is possible to configure several actions for one event. After defining all required entries, confirm the settings with the button  .

11.1.2 All available actions and All system actions window

The window shows all defined actions and system actions. Each of them can be:

- edit by clicking the button:  ,
- try it out by clicking the button: 

,
- delete it, using the button:  .

11.2 Inputs

In this tab, defined actions can be assigned and configured to specific inputs.

No.	Name	Actions	
0	DI 0	Action Off 	Action On 

Depending on the type of input action (this parameter is defined in the I/O Settings / Inputs tab - see section 10.2 Inputs) different forms of action are available to trigger the assigned action.

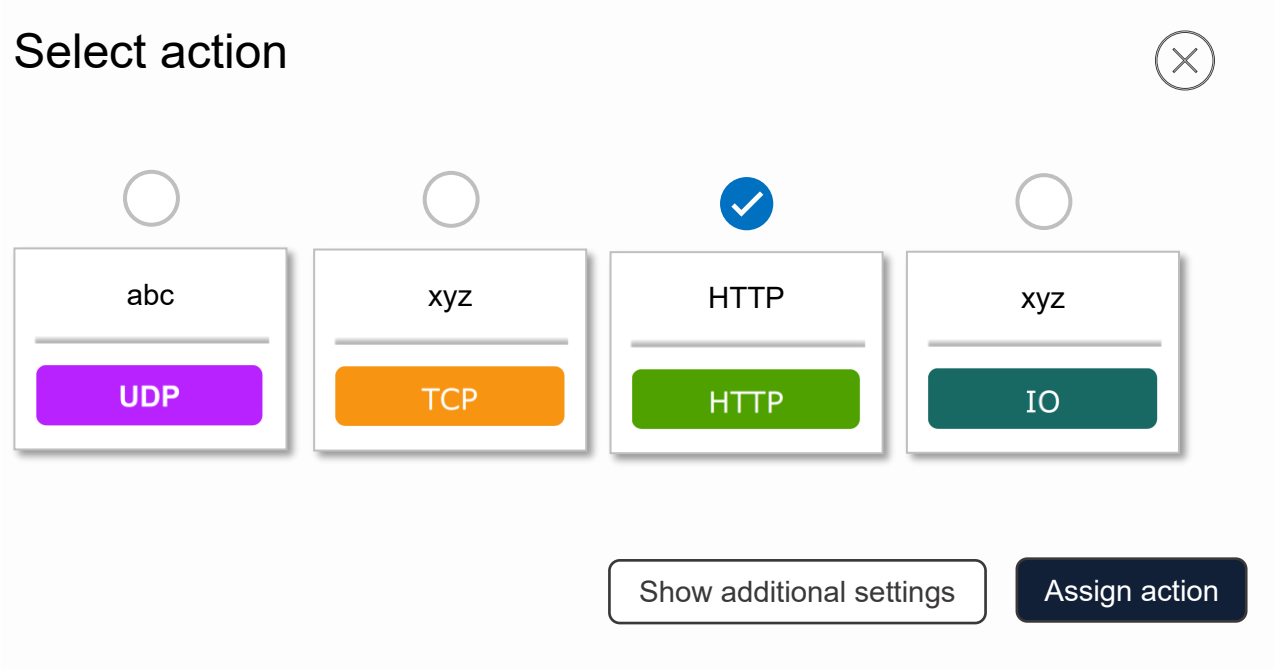
Selected type of action	Available forms of action	Action which will trigger the assigned action
Standard	Action Off	Action is triggered by switching off the input
	Action On	Action triggers input switching on
Hold	Action Off	Action triggers deactivation of the input - input has been ON for a shorter time than specified by the user (in the Parameter field - see chapter 10.2 Inputs)
	Action On	Action triggers switching on of the output
	Action Hold On	Action triggers activation of the input for a time longer than specified by the user (in the Parameter field - see chapter 10.2 Inputs)
	Action Hold Off	Action triggers deactivation of the input - the input has been switched on for a longer time than specified by the user (in the Parameter field - see section 10.2 Inputs)
Cnt	Action I	Action is triggered by the specified number of activations occurring in the user-defined time interval (in the Parameter field - see chapter 10.2 Inputs)
	Action II	Action is triggered by the defined number of activations occurring in the user-defined time interval (in the Parameter field - see chapter 10.2 Inputs)
	Action III	Action is triggered by the defined number of activations occurring in the user-defined time interval (in the Parameter field - see chapter 10.2 Inputs)
	Action IV	An action is triggered by a specific number of activations occurring within a user-defined time interval (in the Parameter field - see section 10.2 Inputs)
Toggle	Action I	Consecutive pulses at the input trigger Acion I and Acion II alternately.
	Action II	
Freq	Action Off	The action calls for switching on the input with a frequency lower than the one specified by the user (in the Parameter field - see section 10.2 Inputs)
	Action On	The action calls for switching on an input with a frequency higher than the one indicated by the user (in the Parameter field - see chapter 10.2 Inputs)

The button Go to the input configuration allows quick access to the I/O Settings/Inputs tab.

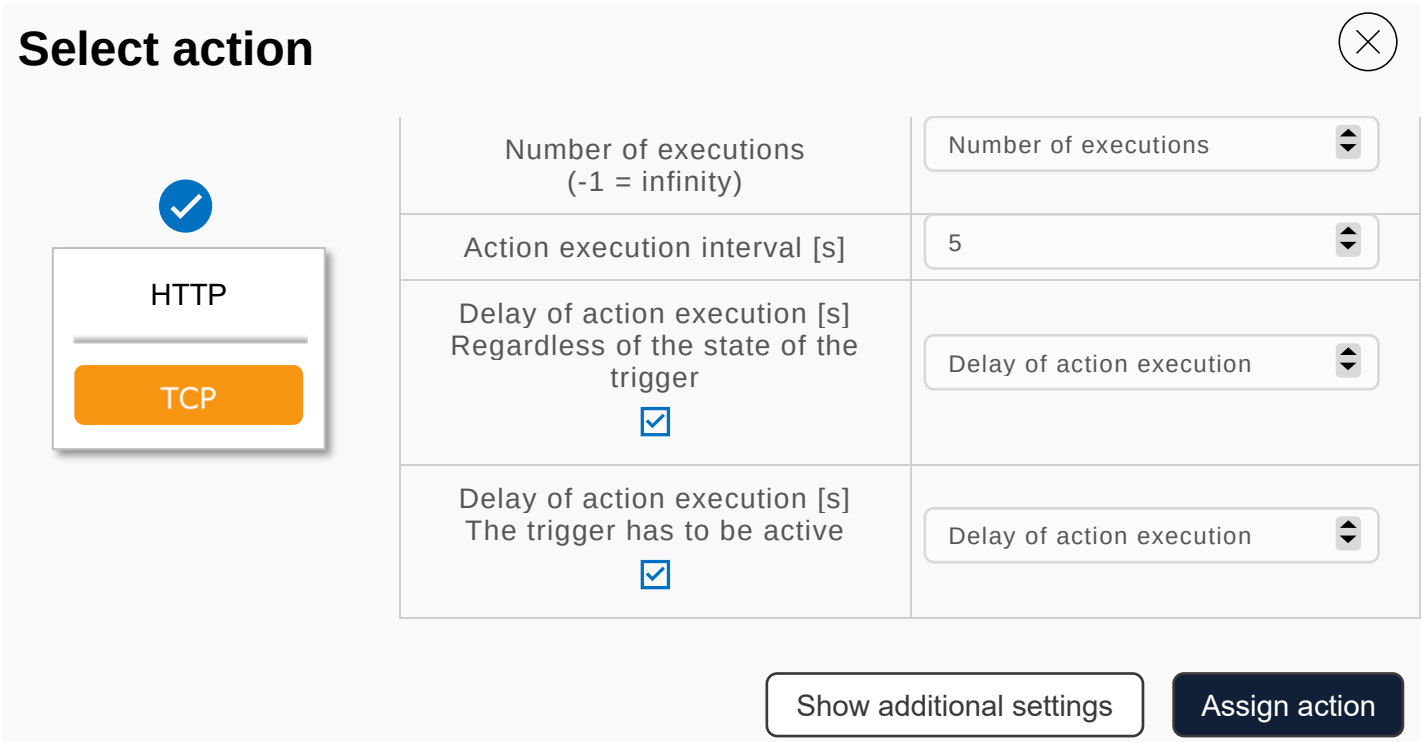
The icon allows you to go to the configuration step by step.

11.2.1 Assigning an action

To assign an action to a selected event, click the + button. A dialog box will be displayed where you can select the desired action, previously defined in the All tab - see section 11.1 All.

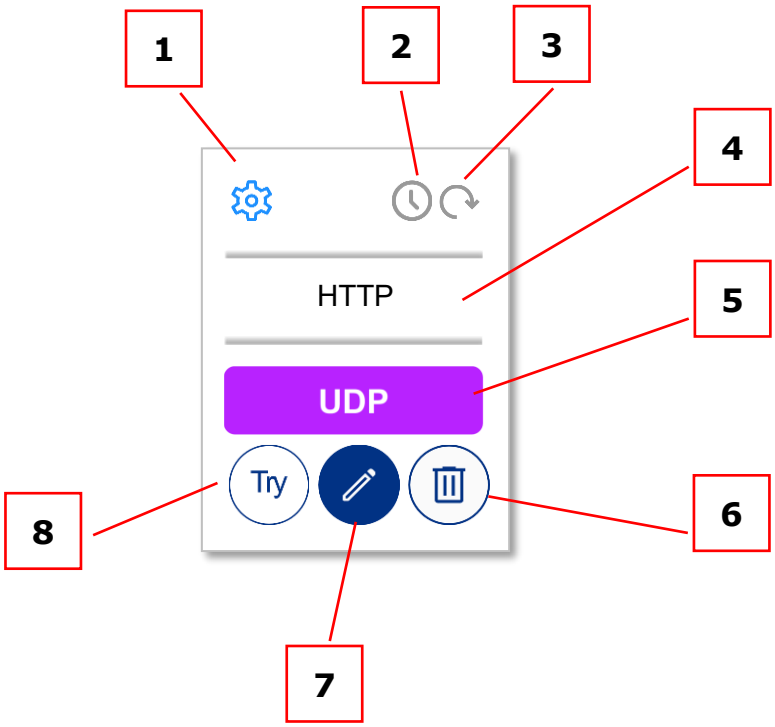


Clicking on the button Show additional settings will display another window, allowing additional settings to be made:



- **Number of executions** – number of actions performed
- **Interval between action executions [s]** – interval between executed actions, if left blank the action will be executed only once,
- **Delay of action execution [s] Regardless of the state of the trigger** – delay of action execution, regardless of the state of the trigger,
- **Delay of action execution [] The trigger has to be active** – delay of action execution, only if the trigger is active.

Confirm the settings with the button Assign action.
After assigning the action, a window appears in the table:



1. Icon for editing additional settings (repetition and delay),
2. Action repetition icon: grey - repetition disabled, green - repetition enabled,
3. Action delay icon: grey - delay off, green - delay on,
4. Action name - assigned by the user when adding or editing settings. action settings,
5. Communication protocol used,
6. Bin icon - clicking in its area will remove the action assignment,
7. Edit icon - clicking in its area will edit the action settings. 8,
8. Action test icon - clicking in its area will cause execution of the action.

11.3 System

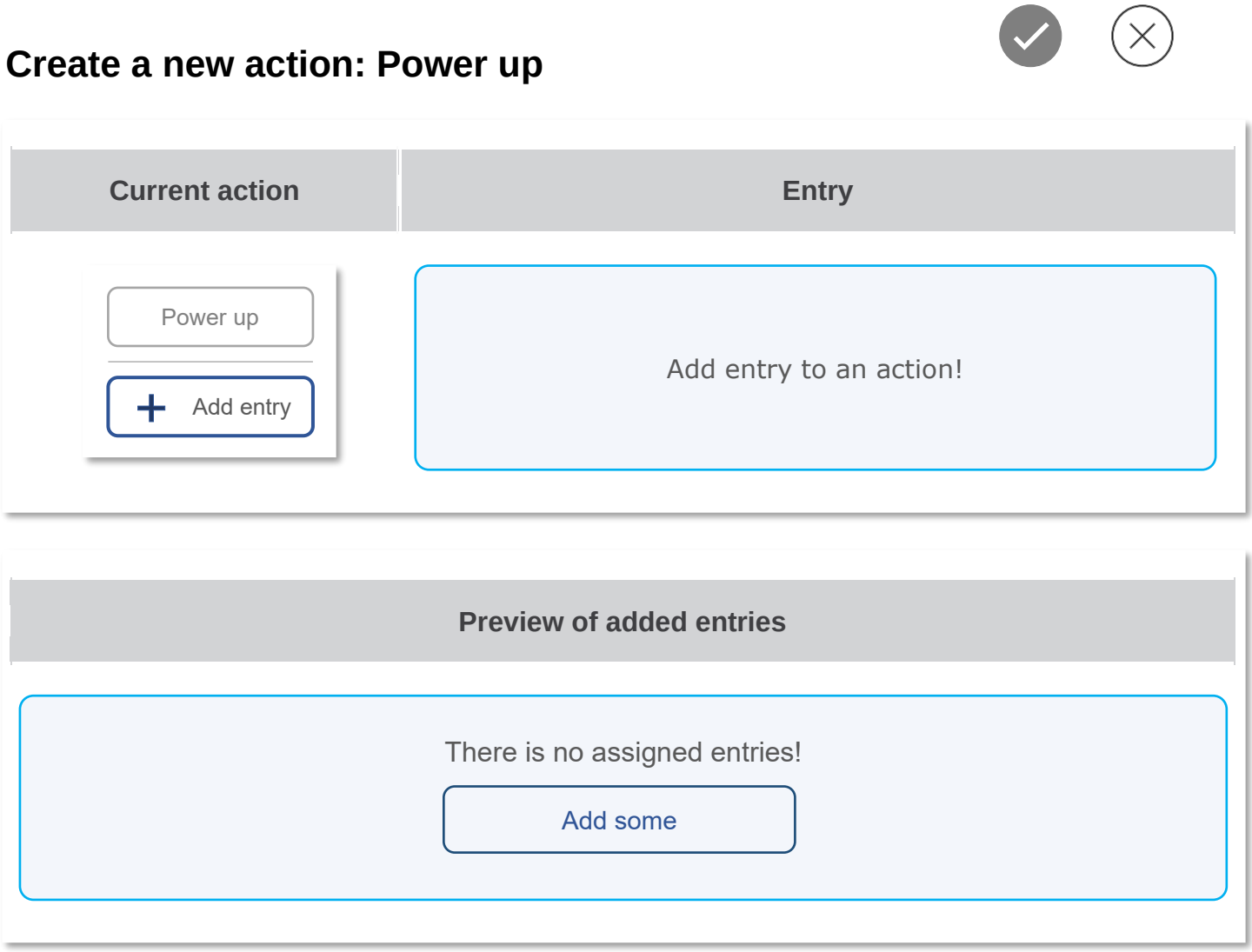
The tab allows you to define the system actions to be performed by the DAXI device when the following events occur:

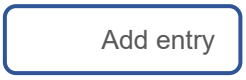
- **Wi-Fi up** – accessing the Wi-Fi network (parameter only available for devices with WiFi),
- **Power up** – restoring power to the device,
- **Ethernet up** – gaining access to Ethernet network,
- **Ethernet down** – Ethernet access lost,
- **Wi-Fi up** – access to Wi-Fi network,
- **Wi-Fi down** – loss of access to Wi-Fi network,
- **Modbus safe mode**

All constant actions

Action type	Entries
Power up ⊕	
Ethernet up ⊕	
Ethernet down ⊕	
Wi-Fi up ⊕	
Wi-Fi down ⊕	
Modbus safe mode ⊕	

To assign an action to the selected event, click the + button. A new dialog box will be displayed:



Press the button  to select the communication protocol and configure it further

- **Select protocol** – the parameters of the individual protocols are described in detail in section 11.1.1 Okno Control Actions.

After configuring the details of the action to be programmed, press the button  . It is possible to configure several actions for one event.

After defining all required entries, confirm the settings with the button  .

11.4 Periodic

The tab allows the definition of periodic actions - performed at specific intervals.

12 Configuration of notifications

The Notifications tab allows the configuration of various notifications - enabling, disabling and assigning notifications, including E-mail, SMS, SNMP Trap, MQTT, concerning the operation of sensors, inputs and outputs.

In order for notifications to be sent effectively you must:

Step 1. Enable the notifications option in the tab of the selected system elements: sensors inputs or outputs, see section 12.1 Inputs and 12.2 Outputs to determine the type of notifications

Step 2. Depending on the selected notification type - SMS, e-mail, SNMP Trap, MQTT - make the configuration in the Services tab - see chapter 14 Network services (Services.

Step 3. Enable the notification option in the Configuration tab - see chapter 12.3 Configuration

12.1 Inputs

In the Inputs tab, you can configure the settings for notifications regarding the operation of the inputs connected to the device. When the icon is pressed, notifications are activated for the selected input, leaving only its details to be configured. Full personalisation is possible in the configuration window that appears when the notifications function is activated:

DI 0				
State	E-mail	SMS	SNMP Trap	MQTT
On change action	☐	☐	☐	☐
Info	☐	☐		☐

It is possible to attach E-mail, SMS, SNMP Trap and MQTT notifications.

> Tip — In order for E-mail, SMS, SNMP Trap and MQTT notifications to function correctly, these options must be configured in the Services tab - see chapter 14 Network services (Services).

In the table displayed, the user has the option to select what kind of notifications are to be sent in response to the occurrence of specific events:

- **On change action** – change of the input status (on - off),
- **Info** – information about the input status.

> Tip — In order to activate the notification function, it is important that, in addition to the settings made here, this option is also activated on the Configuration tab - see section 12.3 Configuration

12.2 Outputs

In the Outputs tab, you can configure the settings for notifications regarding the operation of the outputs connected to the device. By pressing the icon  , notifications are activated for the selected output, leaving only the details to be configured. Full personalisation is possible in the configuration window that appears when the notifications function is activated:

DO 0				
State	E-mail	SMS	SNMP Trap	MQTT
On change action	☐	☐	☐	☐
Info	☐	☐		☐

It is possible to attach E-mail, SMS, SNMP Trap and MQTT notifications.

> **Tip** In order for E-mail, SMS, SNMP Trap and MQTT notifications to function correctly, these options must be configured in detail under the Services tab - see chapter 14 Network services (Services).

In the table displayed, the user has the option of selecting which types of notifications are to be sent in response to the occurrence of specific events:

- **On change action** – change of the output status (on - off),
- **Info** – information on the output status.

> **Tip** In order to activate the notification function, it is important that, in addition to the settings made here, this option is also activated on the Configuration tab - see section 12.3 Configuration

12.3 Configuration

In the Configuration section, there is an option to activate the notification function necessary for sending messages. In addition, the user has the option to adjust general parameters related to the sending of notifications.

Protocol	Value	Description
Notifcation		Enable notification
MQTT info	60	MQTT info time [s]
MQTT Retain		Set MQTT Retain flag
IO time	100	Minimum time before sending another state change for inputs and outputs [ms]

- **Notification** - activation / deactivation of notifications
- **MQTT info** - frequency of MQTT messages with information about the state of the sensor / input / output
- **MQTT Retain** - enable/disable MQTT Retain - enabled means that brokers will retain recent messages for subjects to which the device sends notifications,
- **IO time** - the minimum time that must elapse between successive changes of state on the inputs/outputs to avoid excessive sending of notifications, especially when testing or experimenting with the device's inputs/outputs.

The tabs also include: Sensor, Inputs and Outputs.
Each table contains predefined commands to send email and SMS notifications containing the current states of the device. In addition, the user can edit these commands, allowing them to be customised according to personal preferences, for example by adding a device name. Each table also contains a topic, the use of which is necessary when sending notifications via the MQTT protocol.

Inputs		
MQTT	IQIO IO/c09bf4a003a2	MQTT input topic

Outputs		
MQTT	IQIO IO/c09bf4a003a2	MQTT output topic

13 Binding

The Binding tab allows you to configure binding - poller settings, transferring input/output states, assigning outputs/inputs to KNX groups, etc.

13.1 Outputs

This tab enables you to assign outputs (both physical and virtual) to specific KNX groups and to redirect status from other components:

Physical outputs configuration

No.	Name	KNX read	Route to
0	DO 0	0/0/0	0[2]

- **Name** - allows the output to be renamed,
- **Route to** - indicates the source that is to influence the output state - a change of state on the channel indicated in this field will result in a corresponding change of the output state.

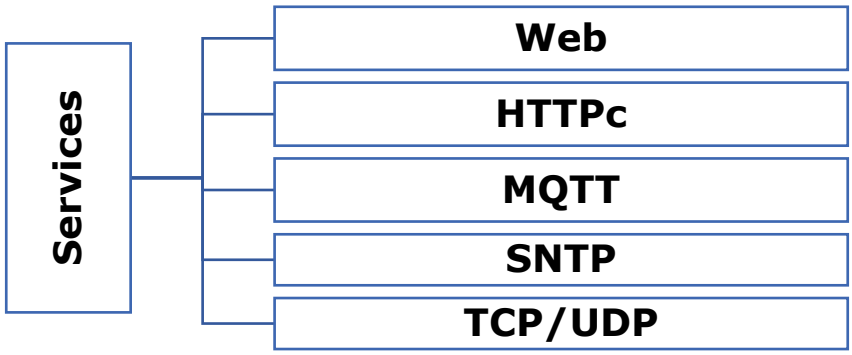
List of possible sources of the output state:

- **i[x]** - state of the input channel,
- **o[x]** - state of the output channel coil,
- **o[x].on** - state of the output channel,
- **v[x]** - state of virtual variable,
- **s[x].aHi** - sensor high alarm,
- **s[x].aLo** - sensor low alarm,
- **s[x].wHi** - sensor high warning state,
- **s[x].wLo** - sensor warning low state,
- **s[x].err** - sensor error,
- **s[x].ok** - sensor OK,
- **ping[x]** - ping status: 0 - error, 1- success,
- **poll[x].y** - poll value.

If the source indication is preceded by the characters "!i", the state of the output relay coil will be opposite to the source state. For example: !"io[3] means that the output will have a state opposite to output 3.

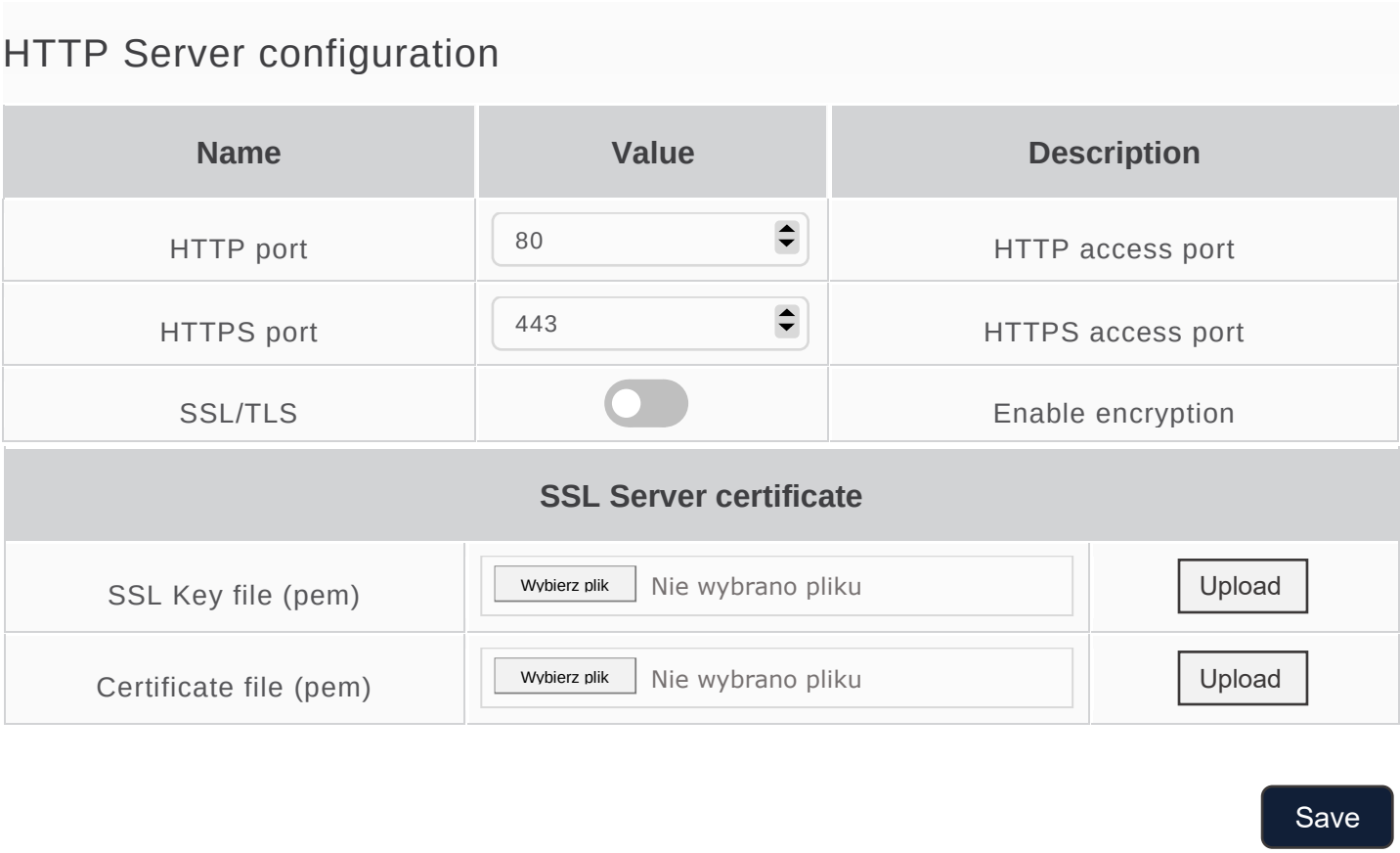
14 Network services (Services)

This tab presents options for the detailed configuration of support for various communication protocols, which is a key element of the device's functionality:



14.1 Web

In this section, the user can adjust the settings for the device's web interface, manage access to resources or modify parameters for connection to the network.



- **HTTP Port** – the HTTP port from which requests are sent,
- **HTTPS port** – the HTTPS port from which requests are sent,
- **SSL/TLS** – enable/disable encryption
- **Select Key file (pem)** – allows loading the SSL server key (in pem format)
- **Select CSR file (pem)** – loads the server CSR key (in pem format)

14.2 HTTPc

In this section, it is possible to configure the device to initiate HTTP connections to specific servers or services. URLs, request parameters and other connection details can be defined here. The DAXI device can send HTTP/HTTPS event information via GET or POST.

HTTP Client configuration

Name	Value	Description
HTTP Client		Enable HTTP Client
Server		Remote server address
HTTP port	0	HTTP access port
HTTP Method	GET	HTTP request default method
Content type	text/plain	Content-type header
Resource	/	Http resource i.e. /rfid.php
User		Auth user
Password		Auth password
HTTP ping server interval	0	Ping time in secs. 0-disable
HTTP ping server	HTTP request payload. I.e. ping=1&mac=%emac%	

- **Enable** – Enable the HTTP Client service,
- **Server** – address of the HTTP server to which information will be sent,
- **HTTP Port** – the port the HTTP server is listening on,
- **HTTP Method** – the method of sending GET / POST / PUT / DELETE messages.
- **Content type** – the type of content:
  - **text/plain**
  - **json**
  - **xml**
- **Resource** – the resource that the module will refer to,
- **User** – user name,
- **Password** – password,
- **HTTP ping server** – the frequency of the ping request,
- **HTTP ping server** – content of the ping request.

SSL/TLS		Enable encryption
Root certificate		Use CA ROOT certificate
Skip cert CN check		Skip certificate Common Name check
Use Client certificate		It needs upload client's key, password and certificate
Client key password		

- **SSL/TLS** – enable/disable encryption,
- **Skip cert CN check** – skip the certificate common name check
- **Use Client certificate** – require client key, password and certificate to be sent,
- **Client key password** – password for the client key.

SSL Server certificate		
SSL server root certificate	Wybierz plik Nie wybrano pliku	Upload
Client certificate	Wybierz plik Nie wybrano pliku	Upload
Client key	Wybierz plik Nie wybrano pliku	Upload

Save

- **SSL server root certificate** – enables to load SSL server certificate,
- **Client certificate** – allows to load SSL client certificate,
- **Client key** – enables the SSL client key to be loaded.

14.3 MQTT

This tab is used to configure the communication parameters with the MQTT broker, enabling data exchange in a publish-subscribe model. It allows key aspects such as topics, server address, port and other relevant connection parameters to be defined. The device sends information to the server every 1 minute and every time there is a change in value. The transmission of this data can be secured by encryption. Once the connection to the MQTT broker is established, users can subscribe to the data coming out of the device. There is no limit to the number of subscribers who can simultaneously receive information from a single device.

MQTT Client configuration

Name	Value	Description
MQTT Client		Enable MQTT Client
Server		Remote server address
MQTT port	1883	port
QoS	QOS0	Quality of service
Subscribe Topic	/	Topic to subscribe
Client ID	dev a002a4	Client ID
User		Auth user
Password		Auth password
Send test message	Before sending a test message, save your settings. Send test messages to the broker with a payload of 1 and topic of \validation.	

- **MQTT Client** – attachment of the MQTT service,
- **Server** – address of the MQTT server,
- **MQTT port** – the port on which the server is listening (usually 1883),
- **QoS**
- **Subsribe Topic** – the topic to which the message will be sent (the topic must be in the format e.g. /sensor/home - without the "/" at the end of the line),
- **Client ID**
- **User** – (optional) mqtt username,
- **Password** – (optionally) password of the mqtt user,
- **Send test message**

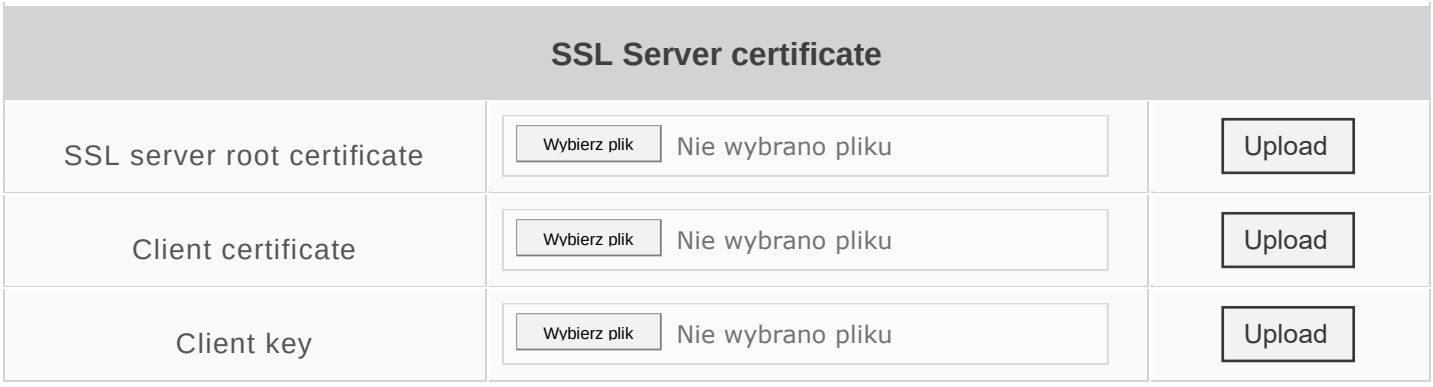
SSL/TLS		Enable encryption
Root certificate		Use CA ROOT certificate
Skip cert CN check		Skip certificate Common Name check
Use Client certificate		It needs upload client's key, password and certificate
Client key password		

- **SSL/TLS** – Enable/disable encryption,
- **Root certificate**
- **Skip cert CN check** – skip the certificate common name check
- **Use Client certificate** – require uploading client key, password and certificate
- **Client key password** – password for the client key

The device is equipped with the LWT mechanism, which stands for 'Last Will and Testament'. LWT is a mechanism that allows an MQTT client to send a message automatically in the event that the client fails or loses connection to the MQTT broker.
The LWT mechanism allows you to define the subject (topic) and content of the message that will be published when the client loses connection.

MQTT Last Will and Testament (LWT)		
LWT		Enable LWT
QoS	QOSO	Quality of service
LWT retain		Set LWT reatain
LWT Topic		LWT Topic e.g.: /device/MAC_address/lwt
LWT Message		LWT Message

- **LWT** – enable/disable the LWT mechanism,
- **QoS -** quality level of message delivery - refers to how the LWT message will be delivered if the client loses connection. It can take one of three values: 0 (At most once), 1 (At least once), 2 (Exactly once),
- **LWT retain** - a flag informing the MQTT broker whether to retain the last LWT message for clients who register with it after the client's LWT connection is lost,
- **LWT Topic** – the topic that will be used to publish the LWT message,
- **LWT Message –** the content of the message that will be published in the LWT topic after the loss of the client connection.



- **SSL server root certificate** – allows loading the SSL server certificate,
- **Client certificate** – allows to load SSL client certificate,
- **Client key** – enables loading SSL client key.

Confirm the settings with the Save button.

Tip

If using the Inveo broker, the values will be as follows:

- MQTT Address: mqtt.inveo.com.pl

- MQTT Port: 1883

You can use the computer on which the Inveo Monitoring application is installed in the broker function.

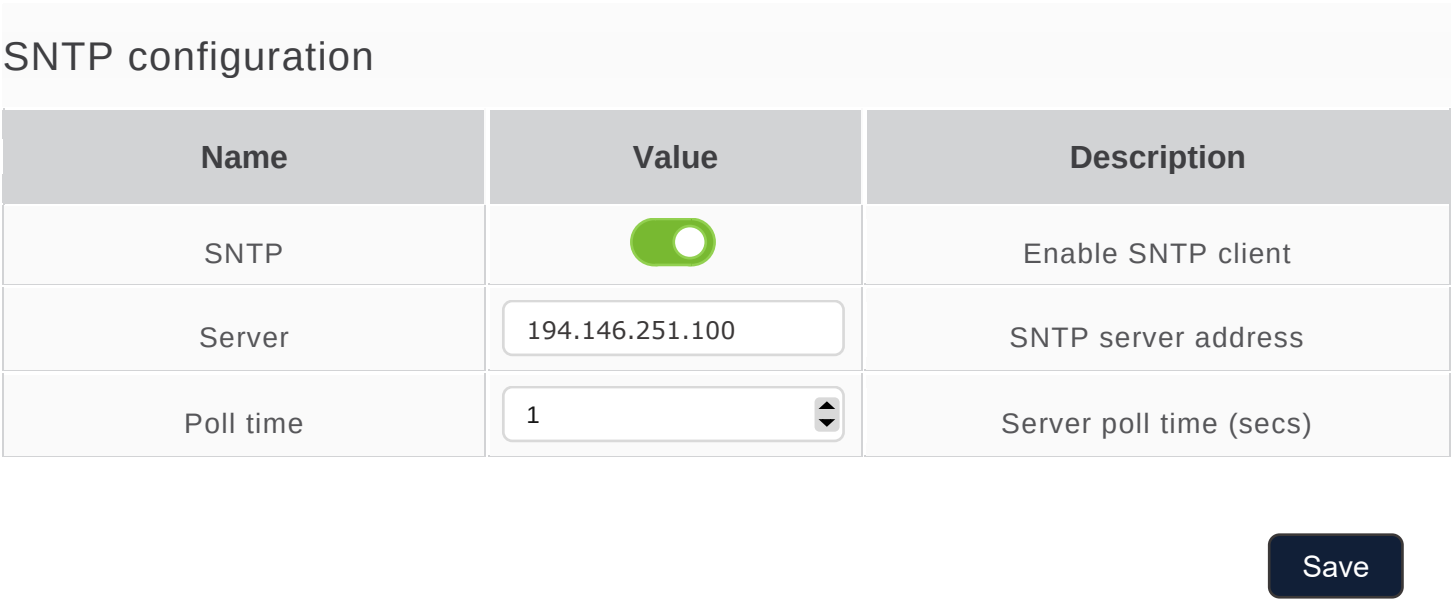
To do this, enter the IP address of the computer in the MQTT Address field.

Tip

Please ensure that the topic you assign is unique, e.g.: /IQIO/ MAC address.

14.4 SNTP

The DAXI device is equipped with SNTP protocol support, which is responsible for synchronising the device's time with the SNTP server. This is crucial for correct data logging and time tasks.
The options available under Services / SNTP allow you to configure the SNTP time server.



- **Enable –** enable/disable SNTP support
- **Server –** SNTP server address
- **Poll time** – server poll time (secs)

Tip

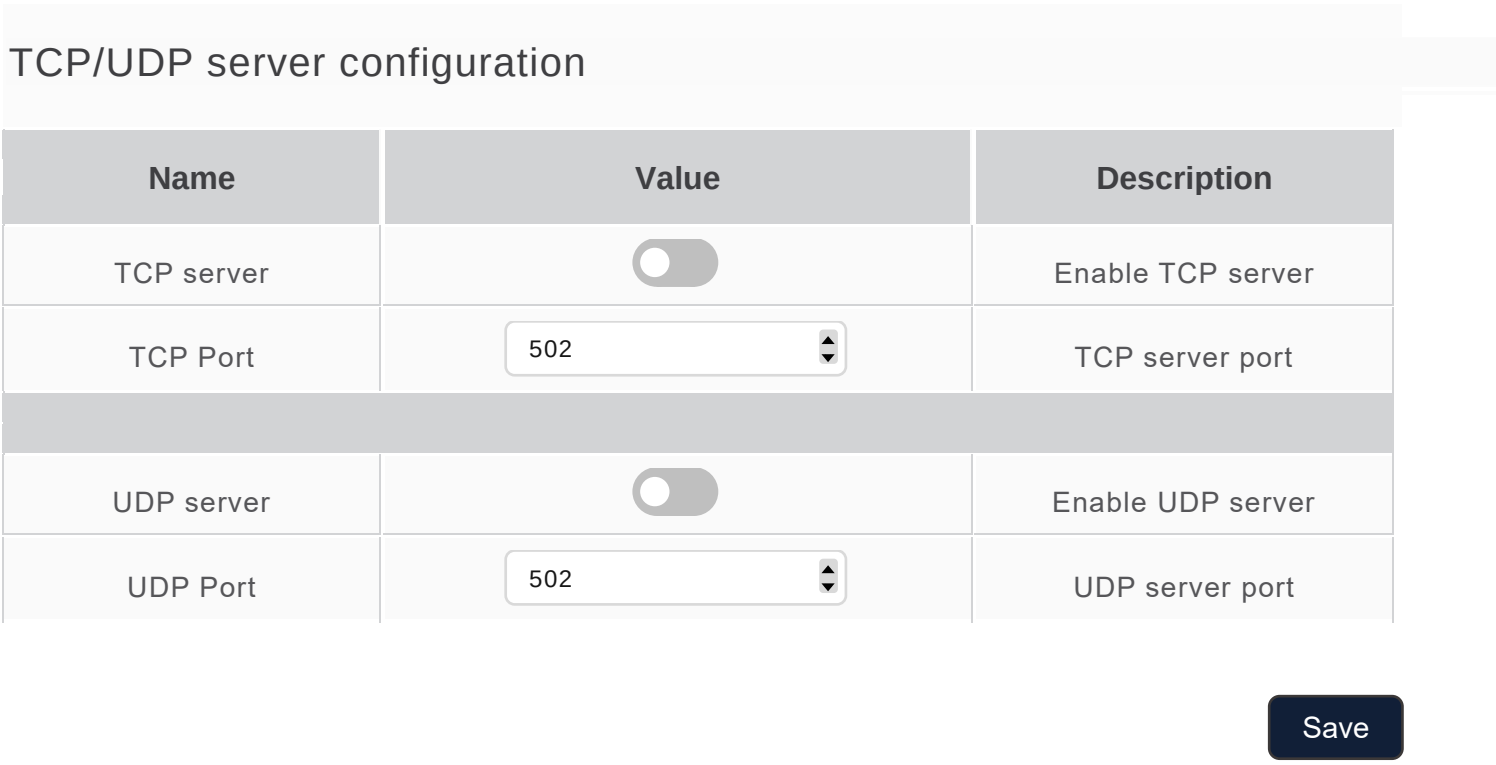
Examples of SNTP servers:

- tempus1.gum.gov.pl – new address: 194.146.251.100
- tempus2.gum.gov.pl – new address: 194.146.251.101

In addition, the DAXI device is equipped with an internal RTC clock with battery backup. When the device does not have permanent access to the Internet, it can use this clock to maintain accurate time - see section15.3 Time.

14.5 TCP/UDP

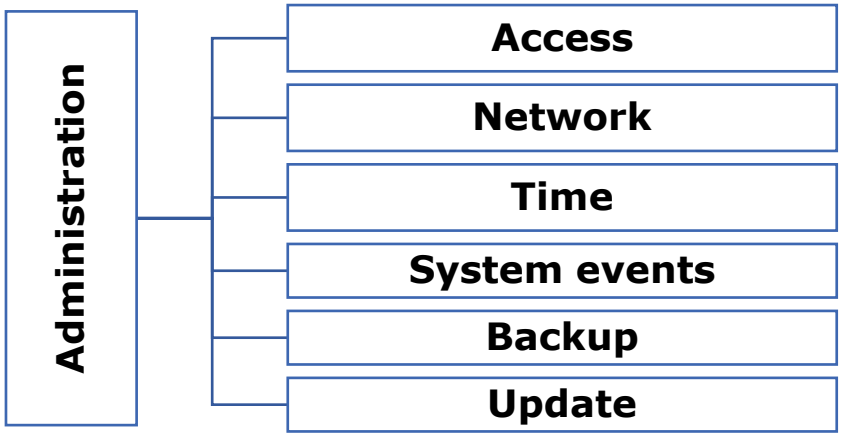
The TCP/UDP tab on the DAXI website allows TCP and UDP communication protocol support to be included and configured. The user can customise settings such as ports and communication parameters, providing flexibility in configuring the device according to network requirements.



- **TCP server** - a location that listens for connections using the TCP protocol,
- **TCP port** - port number used to identify services and applications on target devices,
- **UDP server** - a place that listens for data sent using the UDP protocol,
- **UDP port** - port number used to identify services and applications in the UDP protocol.

15 System administration (Administration)

The Administration tab allows you to manage aspects of the device that affect the operation, security and configuration of the system.



15.1 Access

In this section, the user can manage access to the device webserver. This includes authentication, name and access from Discoverer.

Access configuration

Name	Value	Description
Password		Enable password
Current password		
New password		
Repeat new password		
Module name		
Enable remote config		Allow change configuration by Discoverer app

Save

- **Enable** – enable/disable password,
- **Current password** – current password,
- **New password** – new password,
- **Repeat password** – repeat new password,

- **Module name** – module name (displayed, e.g. in Discoverer programme) - giving an individual name facilitates identification of a device in the system,
- **Enable remote config** – enabling/disabling permission to change configuration via Discoverer program.

Tip

Default settings on the device:

- login: admin
- hasło: admin

15.2 Network

The network settings of the device are configured on this tab - see chapter 7.3 Configuring network settings Configuring network settings.

15.3 Time

This section allows you to manually configure the time settings and time zone and download the current time from your computer.

Time status

Name	Value
Current time	13:58:17
Current date	30-11-2023
Update time in the device	Update time

- **Current time** – preview of the current time in the device,
- **Current date** – preview of the current date in the device,
- **Update time in the device** – allows the time in the device to be set the same as the time in the computer,

Time zone

Name	Value
Daylight saving	
Time zone	(GMT) Western Europe Time, London, Lisbon

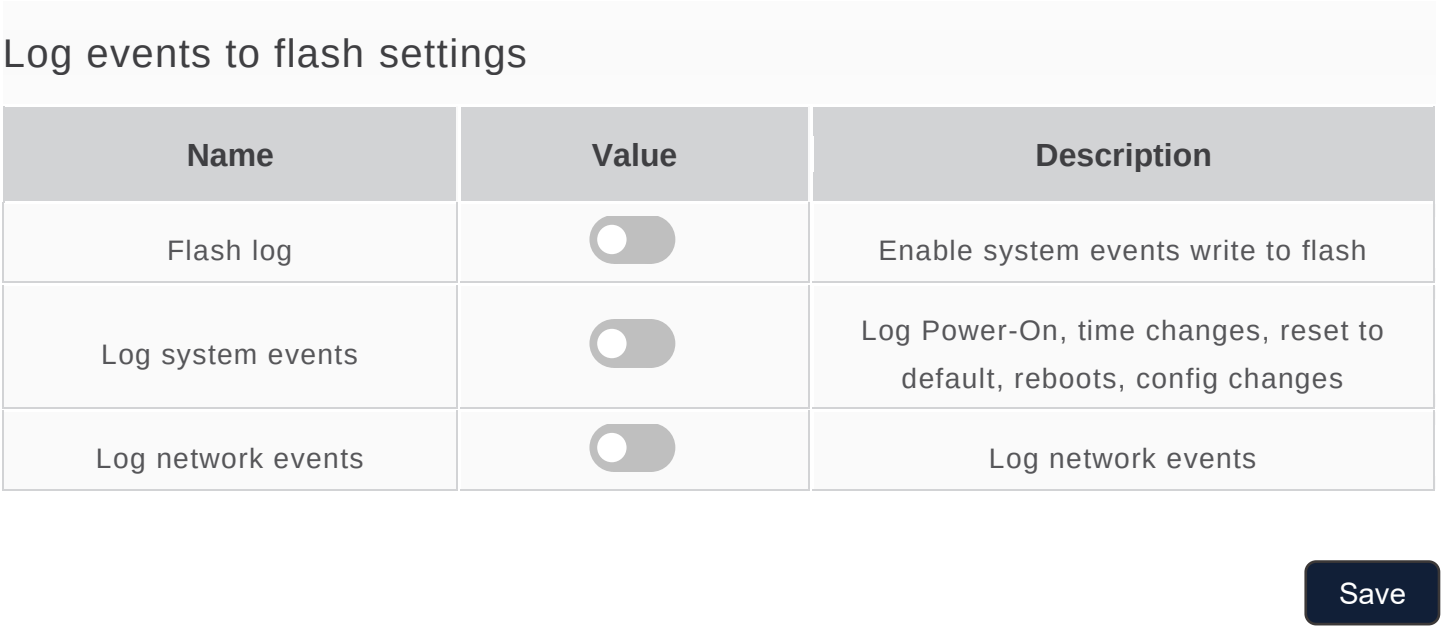
Save

- **Daylight saving** – switching on/off daylight saving time,
- **Time zone** – selection of time zone.

The IQIO IO device is equipped with an internal RTC clock with battery backup. When the device has permanent access to the Internet, the SNTP service can be used to ensure precise time synchronisation (see chapter 14.4 SNTP).

15.4 System events

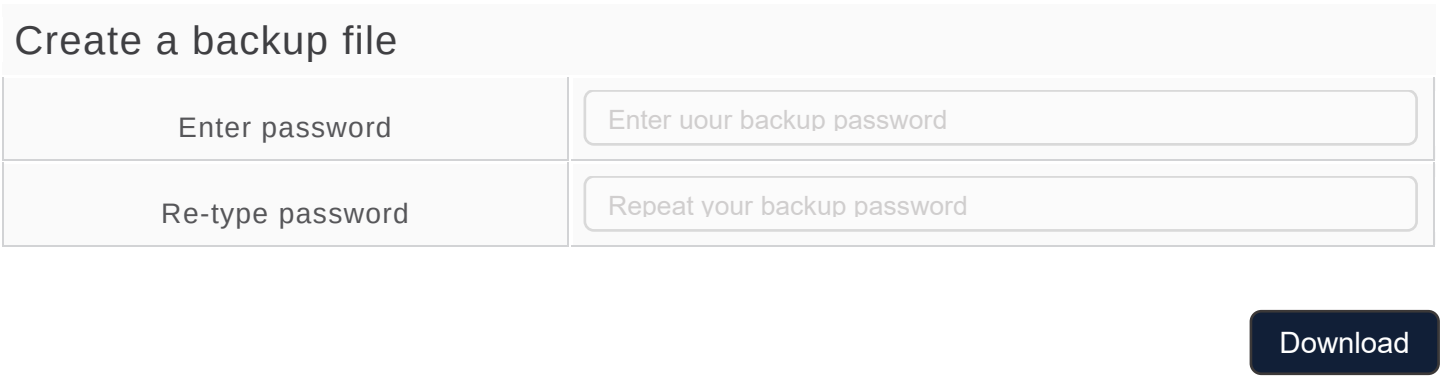
The tab allows system events to be recorded in flash memory, enabling users to view and analyse a variety of system events. This process helps to monitor system performance and diagnose potential problems.



- **Enable** – enable / disable logging of system events to flash memory,
- **Log system events** – enable / disable logging of power-ups, time changes, resetting to default settings, reboots, configuration changes,
- **Log network events** – enable / disable logging of network events.

15.5 Backup

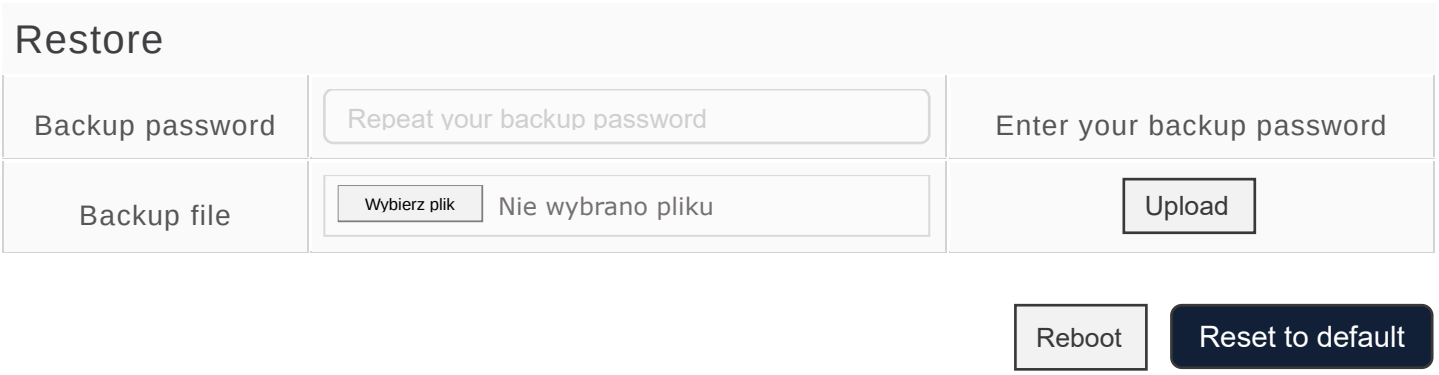
In this section, users can create backups of the current system configuration and restore the system from previous backups.



- **Enter password** – allows you to enter a password to protect the backup being created,
- **Re-type password** – retype the password.

The button 

allows you to save the backup to your computer.



- **Backup password** – password for the backup to be uploaded
- **Backup file** – button for searching the backup file

The button 

will upload the selected backup to the device.

Button 

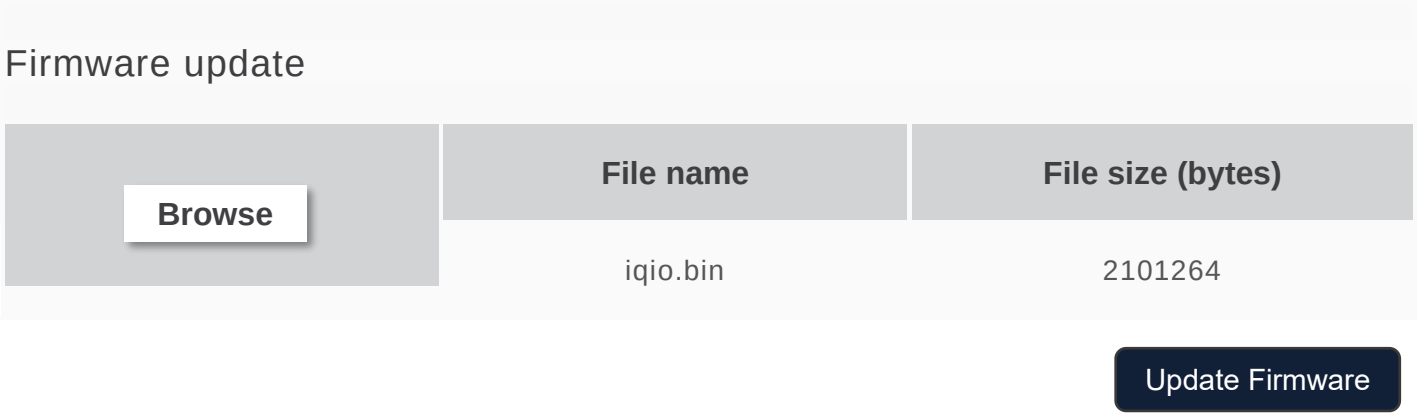
enables rebooting the device.

Button 

restores the factory settings of the device.

15.6 Update

This tab enables the system or device to be updated to the latest software version. Users can upload new firmware or software versions here to provide bug fixes, updated functions and other improvements.



Warning Incorrect use of the firmware update function may damage the module.

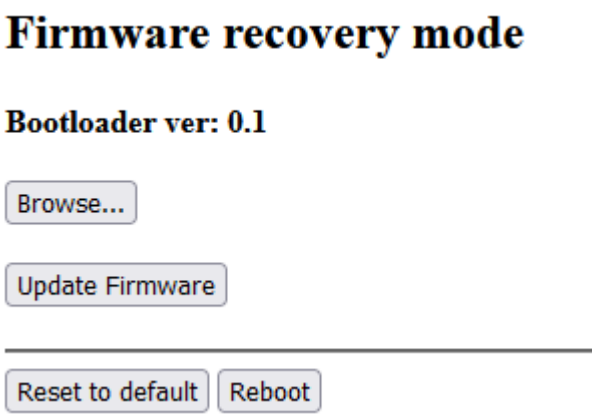
16 Emergency software upload / factory reset

In the event of a device failure preventing normal access to the website, use the emergency procedure:

- Disconnect the device from the power supply
- Press the RESET button
- Power up the device and connect it to the LAN
- Without releasing the RESET button, open the device web page:
  - Adres IP: 192.168.111.15
  - Maska IP: 255.255.255.0

> Tip
>
> To access the address 192.168.111.15, the IP address of the computer must be in the same subnet (example IP address for the computer: 192.168.111.1.) Changing the subnet of the computer is described in section 6.2 Changing the subnet of the computer to be configured.

Referring to the given IP address will access the bootloader of the device. The RESET button can only be released after the page has been opened:



Here we have the possibility to upload firmware, reset the device to factory settings and restart it.

17 Built-in variables

This chapter presents a table with examples of internal variables that enable the precise transmission of data related to the reader's operation. These variables are a key part of the configuration, use in email notifications, SMS, HTTP Client, etc.

Syntax	Example	Description
%out[range],[off],[on]%	%out[0-5],0,1%	state of outputs [range] means the range of outputs to be shown [off] means the value for the inactive state [on] means the value for the active state Example: the state for OUT 0-5 will be shown inactive value is 0 and active value is 1
%in[range],[off],[on]%	%in[0-7],i,I%	Input status [range] means the range of inputs to be displayed [off] means the value for the inactive state [on] means the value for the active state Example: the state for IN 0-7 will be shown inactive value is i and active value is I
%cnt[number]%	%cnt5%	input counter value [number] means the number of inputs Example: the counter value for input 5 will be shown
%sens[number]%	%sens10%	sensor value [number] means the sensor number Example: the value for sensor no. 10 will be shown
%sunrise%	%sunrise%	sunrise time
%sunset%	%sunset%	sunset time
%time%	%time%	current time
%date%	%date%	Current date
%timedate%	%timedate%	Current time and date
%ts%		Current timestamp - the number of seconds since a specific time: 1 January 1970
%mod_name%		User-defined module name
%mod_model%		Device model
%eip%		IP address of the device
%emac%		MAC address

%s[x]%	%s[3]%	Sensor value Example: the value for sensor no. 3 will be shown.
%s[x].statTxt	%s[2].statTxt	Sensor status Example: the value for sensor no. 2 will be shown
%o[x]%	%o[4]%	Output status Example: the status of output 4 will be shown
%i[x]%	%i[1]%	Input status Example: the status of input 1 will be shown
%v[x]%		Value of virtual variable
%cntx%		Input counter value

18 IO commands

Below is a summary of the commands used to create actions based on IO commands (see section 11.1 All). It is worth noting that the following commands are also effective using various protocols such as HTTP, MQTT, UDP and TCP.

Syntax	Description	Values
out_all=10n-11100	command that controls all outputs	**1** - on
		0 - switch off
		n - change state to opposite
		- do not change state
out_on=ch	switch the output on	**ch** = output number
out_off=ch	switch the output off	**ch** = output number
out_inv=ch	change of state to the opposite	**ch** = output number
out_blink=ch,ton,toff,cnt	command to switch an output on or off	**ch** - output number
		ton - output activation time, measured from the moment the action is activated, expressed in 0.1 second, e.g: 10=1second
		toff - output switch-off time measured from the time defined in the tone parameter, expressed in 0.1 second
		cnt - parameter specifying how many times the output is to be activated during a single action; if the field is left blank the output will be activated an infinite number of times
out_time=ch,ton,toff	command to turn the output on for a specified period	**ch** - output number
		ton - output switch-off time measured from the time defined in the tone parameter, expressed in 0.1 seconds
		toff - output cut-off time measured from the time defined in the tone parameter, expressed in 0.1 second, entering the value of single will switch the output on permanently

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