

User manual DAXI



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.

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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 DAXI device provides an advanced solution for controlling electrical circuits. It is equipped with independent outputs that allow the control of a variety of system components, from simple circuits to more complex modules. With the ability to handle multiple sensors (e.g.: temperature, humidity, etc.), DAXI is not only a tool for control, but also for monitoring various parameters in the system.

One of DAXI's key strengths is its ability to automatically respond to signals and readings from connected sensors and digital inputs. The user can programme the device to perform specific actions (actions), such as controlling a specific output or sending notifications in response to a specific signal, etc.

DAXI can be used as a tool for scheduling timed tasks, working on the basis of the Cron syntax characteristic of Linux systems. In this syntax, each line represents a single time criterion which, when satisfied, initiates the designated command.

DAXI has built-in logic capabilities - Logic, Lua. With logic functions and the Lua language, the device is capable of performing complex logic operations without the need for external controllers. This makes DAXI not only an effective, but also a flexible tool for any automation system.

Finally, DAXI supports a number of popular communication protocols such as HTTP, HTTPS, MQTT, SNMP v2/v3, SMSApi, Modbus TCP and Modbus RTU, making it compatible with many other devices and systems. The ability to integrate with external Modbus sensors further extends its range of applications.

5 Description of the DAXI device

The Daxi device combines a programmable I/O controller and a sensor controller. The main task of this device is to collect data from sensors and inputs, process them and perform the corresponding execution functions (actions).

The device is configured via a web browser.

Block diagram:



The module is equipped with a real-time clock with battery backup to perform time-related functions, so that cyclic actions can be performed and at set times. An additional facility is the astronomical clock, which makes it possible to control according to the sunrise and sunset times at a given location.

The clock can be updated with the time from an NTP server via the Internet.

5.1 Sensors

The environmental factor sensors are connected to the unit via a 3-wire bus in the form of an RJ12 flat cable, to which a maximum of 16 sensors can be connected. For ease of installation, the sensors have an additional connector for connecting another sensor.



The device supports the following sensors:

- temperature
- humidity
- flooding,
- phase failure/current loss,
- light brightness
- air pressure,
- water pressure,
- CO/CO₂/ NO_x gases,
- door opening (reed switch).
- others on special request.

Several component measurements can be operated as a single sensor.

Sensor data can be stored in the built-in memory and viewed at a later date. Data can be downloaded in various formats. Viewing using graphs is also provided for convenience,

Each sensor has the ability to set thresholds, beyond which the device will perform a specific action (Action).

The sensor source can be a 3-wire bus, a device queried by the Modbus TCP/RTU protocol (e.g.: meters, counters, thermometers) or another Inveo device supporting sensors. Any of the mentioned readings from external devices can be assigned as a sensor in the Daxi device and perform all the functions belonging to the sensors.

5.2 Actions

The functions performed by the module are available as blocks, defined by the user. An action is a set of functions performed by the module when it is called.

An Action is called, e.g. when a temperature is exceeded, when an input is changed, when a connection is lost, etc. A different Action can be assigned to each such event or an Action can be shared between several events.

An Action can contain the following actions (one or many):

- driving an output,
- sending an HTTP request,
- sending an e-mail,
- sending an SNMP Trap,
- sending an SMS,
- sending an MQTT message,
- sending data via UDP/TCP,
- sending KNX message,
- writing to internal variable,
- writing to log memory.

Actions can be triggered once - e.g. on a change of input or at set time intervals. E.g.: When the temperature is exceeded, send E-mail only after 1 minute and repeat the sending 6 more times every 10 minutes.

5.3 Inputs

Each input is equipped with a pulse counter, noise filter, state reversal capability.

- The built-in algorithms allow many useful functions such as:
 - simple on-off dependencies
 - long press detection allowing, for example, one button to control 2 actions,
 - counting the number of activations and only after a preset time has elapsed calling the corresponding function (up to 4 different functions) - allowing up to 4 separate circuits/devices to be controlled from a single pushbutton,
 - comparing the pulse frequency to a preset value and performing the corresponding action on change,
 - standard input pulse counting and, for example, sending this data to a server.

Input flow diagram:



In addition to physical inputs, the module has virtual inputs to which data can be routed from other sources, such as:

- MODBUS devices,
- other Inveo devices,
- internal states of the device, i.e.: alarm status from the sensor, connection status to the MQTT broker or an internal variable and, based on these values, a function can be assigned that will, for example, send an e-mail informing that the sensor is faulty or has no connection to the MQTT broker.



5.4 Outputs

The device's outputs can operate in the following modes:

- bistable on/off,
- astable continuous alternating on/off at set time,
- timed activating an input activates it for a preset time,
- roller shutter groups 2 outputs for operation with curtains/roller shutters.



Outputs can be assigned to redirections from another source (e.g. inputs, channel states of external modules, connection states with external modules, internal variables, alarm states of sensors).

Outputs can be assigned to KNX groups and react to incoming messages.

In addition, virtual outputs are provided which allow the output to be redirected to external Modbus modules, Inveo or internal variables e.g.: alarm status from a sensor scheme, connection status from an MQTT broker.

5.5 Logic module

The user can combine any logic function of the device states (e.g. input state, output state, sensor state, variables, etc.) and, depending on the result, control outputs or call Actions. For advanced users, a LUA interpreter has been developed that allows unlimited control of the device functions.

5.6 Integration into intelligent building systems

Built-in support for the KNX-IP protocol facilitates the integration of the device into building automation.

Using logic and timing functions, it is possible to build any relationship that can be used for building control.



5.7 Integration with other devices

The device supports a number of network protocols that enable data exchange, such as HTTP(S), MQTT(S), MODBUS, SNMP, KNX, TCP/UDP, Email, SMS.

5.8 Integration with the cloud

Access from anywhere to data from the device is possible via cloud applications, e.g. such as CEAppMonitor (<u>https://cemonitorapp.com/free/inveo</u>).



5.9 MODBUS server and client

The built-in Modbus polling module reads data from other devices and makes it available as a data source for inputs, outputs and sensors.

The device can also be queried by another Modbus device, making it possible to integrate the device with I/O modules, sensors, PLCs, etc.

5.10 Integration with Inveo devices

The module recognises other Inveo devices on the network and allows access to them from the device (integrator).

This makes it possible, for example, to configure a temperature sensor to receive data from a remote point or to connect an input or output to a remote device.

The device works with Nano, Hero, Lantick and Iqio modules.



5.11 Checking the status of network devices

The module allows the status of other devices connected to the LAN/Wifi network to be checked by periodically sending ICMP (Ping) packets. Depending on the status of these devices, the module can send a notification or reset the device.



5.12 Facilities

A number of enhancements are available to the user, such as:

- Notifications centre (Notifications) a function for setting up notifications quickly, without the need to create actions and advanced configurations
- Actions wizard
- Debugger a system console with messages to help diagnose the operation of the device
- Work matrix function for quickly assigning KNX groups to all outputs simultaneously or configuring HTTP/KNX/UDP/TCP messages for inputs,
- Schedule time-based functions cyclic and in the form of a CRON statement

6 Assembly of the device

6.1 Technical data

Power supply	PoE: 33-57V PoE IEEE 802.3af DC: 12-24VDC (3.5mm screw connector) 230 VAC - optional
Power consumption	1.2 - 3.5W depending on the number of outputs activated
Bus	1-wire - RJ12 flat cable Support for up to 16 sensors dedicated sensors: temperature, humidity, water pressure, air pressure, analogue voltage, analogue current, CO, CO ₂ , NO _x gases
Inputs	8 digital inputs input type: isolated galvanic NO, pre-polarised, NO/voltage input voltage: 10-24V
Outputs	8 NO relay outputs maximum operating voltage: 230 VAC maximum load current per channel: 2A operating modes: bistable, astable, monostable (single trigger), roller shutter, timer
Communication	10/100 Mbps Ethernet port,
Operating temperature	from -10°C to +55°C
Housing	Enclosure class: IP30

6.2 Dimensions



6.4 Connection diagram

$\begin{array}{c} \hline \\ \hline $	Relay output connections
RESET SWITCH POE OUT ETH 1 PoE 0UT ETH 2 PoE 820.3af BUS BUS INVEO WI-FI ETH 1 ETH 2 BUS Power	Top connectors
POWER POWER DI 24VDC 230VAC 10-24VDC COM 0 1 2 3 4 5 6 7 COM • • • • • • • • • • • • • • • • • • •	Bottom connectors

<u>Relay output connectors</u> - designed to allow the connection of supported outputs:



<u>Top connectors - level 2</u>



- 1. RESET button
- 2. PoE power distributor switch: in the upper position no power at the switch "ETH1 PoE Out", in the lower position power at the switch "ETH1 PoE Out" is switched on,
- 3. switch port ETH1 PoE OUT*
- 4. switch port ETH2 PoE 802.3 af*
- 5. supported sensors connected via RJ12 cable, up to 16 sensors (connected to each other in daisy chain system or via BUS Expander)
- 6. WiFi antenna input (optional)

*The ETH1 and ETH2 ports are switch ports, where the ETH2 port allows the DAXI device to be powered via PoE 802.3af. When powering the DAXI via the ETH2 port using PoE, the ETH1 port becomes available to power another device. This is possible by switching switch 2, allowing PoE power to be passed on. In such a Daisy chain system, up to two devices can be connected (e.g. DAXI + DAXI.

Bottom connectors - designed to enable connection of supported inputs and power supply (10-24 VDC and optionally for 230VAC):

Inputs can be connected in both short-circuit and voltage modes:



Wiring diagram when using NO type inputs (pre-polarised):

Wiring diagram when using optoisolated type inputs (10-24VDC voltage input):



6.5 Meaning of the LEDs



- 1. Outputs status
- 2. Status of inputs
- 3. Wi-Fi connection active:
 - off: WiFi inactive,
 - on: WiFi active,
 - flashing: WiFi connection error
- 4. Ethernet link 1
- 5. Link Ethernet 2
- 6. Sensor bus status:
 - off: sensor bus disabled,
 - on: Sensor bus active,
 - blinking: error on sensor bus. 7.
- 7. Power supply to the device
- 8. Function button
- 9. Additional LEDs their assignment is user-defined

7 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.

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.

Interface:	Broadcast	~	<u>D</u> is	cover Dev	vices	5						
IP Address	Host Name	MAC Address	Model		HV	SV	DHCP	Remote Co	onfig B	ootLoader	Module Name	^
192.168.0.214	HERO		HERO-WS		1.0	1.25	DHCP	ON	-			
192.168.0.238	RFID-WEJ		RFID IND-L	CD Mif	2.0	0.67		ON				
192.168.111.1	7		LNTCK		1.0	0.01		ON				
192.168.5.1	M_P1_IN1		Lantick-0-1	.6	1.3	4.17		OFF	C	FF		
192.168.5.10	LANTICKPRO		Lantick-0-1	.6	1.3	4.17		OFF	C	FF		
192.168.5.11	LANTICKPRO		Lantick-8-0)	1.3	4.13		OFF				
192.168.5.12	LANTICKPRO		Lantick-8-0)	1.3	4.13		OFF				
192.168.5.13	DZWONEK_GORA		Lantick-1-0)	1.3	4.11		ON				
192.168.5.2	M_P0_OUT1		Lantick-8-0)	1.3	4.13		OFF				
192.168.5.20	M_P2_0		Lantick-4-4	ł	1.3	4.14		OFF				
192.168.5.21	LANTICKPRO		Lantick-4-4	ł	1.3	4.18		OFF	C	FF		
192.168.5.3	M_P0_OUT2		Lantick-8-0)	1.3	4.13		OFF				
192.168.5.30	LANTICKPRO		Lantick-8-0		13	4 18		OFF		N	3P SWIATLO	-
192.168.5.31	LANTICKPRO		Lantick-0-	🔍 Chan	ge setting	s					- 0	
192.168.5.4	M_P0_SMT_IN		Lantick-0-	Eth					Wlan			
192.168.5.40	ETH2COM		MEDIA-RS	TP		192.16	8.22.2		Enable	• r	7	
<												
Filter by device	name:			Netma	isk	255.25	5.255.0		IP		0.0.0.0	
Only NEW D	evices			Gatew	ay	192.16	8.22.1		Netma	isk (0.0.0	
,				Doc1		213.5	255.2		Gatew	ay (0.0.0	
				DIISI		215.5.			Dns1	2	213.5.255.2	
nen a dia	alog box op	ens, the		Dns2		213.5.	255.254		Dns2	[2	213.5.255.254	
evant IF	oddress, r	mask, gatewa	ay, 🛛	DHCP					DHCP		2	
NS1/DNS2 can be set, and the Host				Config					SSID			
				Name		DAXI 2	023		Energy	tion		
me can		2		nume					Encryp		WPA3_PSK	
me can				_								

If Remote Config is disabled (enabled by default), it is necessary to configure the device by changing the subnet of the computer (section <u>7.2 Changing the subnet of the computer to be configured</u>).

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

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
Repeat new password Module name Enable remote config		Allow change configurat Discoverer app

Then click Save to save the settings.

7.2 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 \rightarrow Control Panel \rightarrow Network and Internet \rightarrow Network and Sharing Centre \rightarrow Change network adapter settings.

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

Once selected, the configuration screen will appear:

🖗 Właściwości: Połączenie lokalne								
Sieć Udostępnianie								
Połącz, używając:								
Realtek PCIe GBE Family Controller								
Konfiguruj								
To połączenie wykorzystuje następujące składniki:								
🗹 📮 Harmonogram pakietów QoS 🔹								
🗹 릟 Udostępnianie plików i drukarek w sieciach Microsoft N								
GEIP PROFINET DCP								
Protokół internetowy w wersji 6 (TCP/IPv6)								
Protokół internetowy w wersji 4 (TCP/IPv4)								
Sterownik We/Wy mapowania z odnajdywaniem topolc								
Responder odnajdywania topologii warstwy łącza								
4 III P								
Zainstaluj Odinstaluj Właściwości								
Opis								
Protokół kontroli transmisii/Protokół internetowy (TCP/IP).								
Domyślny protokół dla sieci rozległych, umożliwiający								
komunikację połączonych sieci roznych typow.								
OK Anuluj								

Changing the network configuration in WINDOWS

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

Właściwości: Protokół internetowy w w	ersji 4 (TCP/IPv4)						
Ogólne							
Przy odpowiedniej konfiguracji sieci możesz automatycznie uzyskać niezbędne ustawienia protokołu IP. W przeciwnym wypadku musisz uzyskać ustawienia protokołu IP od administratora sieci.							
🔘 Uzyskaj adres IP aut <u>o</u> matycznie							
Oliversity view of the second seco							
Adres IP:	192.168.111.1						
Maska podsieci:	255.255.255.0						
Brama domyślna:							
 Uzyskaj adres serwera DNS auton 	natycznie						
 Użyj następujących adresów serw 	verów DNS:						
Preferowany serwer DNS:							
Alternatywny serwer <u>D</u> NS:							
Sprawdź przy zakończeniu poprawność Zaawansowane							
OK Anuluj							

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).

7.3 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).

Ethernet network configuration

Name	Value	Description
DHCP		Enable Ethernet 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

Save

- 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:
 - o Open
 - WEP
 - WPA-PSK
 - WPA2_PSK
 - \circ WPA_WPA2_PSK
 - WPA3_PSK
- SSID the name of your network,
- **Password** the password for accessing the Wi-Fi network.

Scan available Wi-Fi

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

8 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.

Firmware update

Browse	File name	File size (bytes)
DIOWSE	daxi.bin	2101268
		Update Firmware

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



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.



9 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.

Model: Daxi 8-8 IP: 192.168.111.15	Name: DAXI test	Firmware: 0.07	MAC: 00:00:00:00:00:00
------------------------------------	-----------------	----------------	------------------------

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.

10 Device status overview (Status)

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



10.1 Sensors window

The window displays the current readings from the sensors defined on the Sensors tab.

Enable autorefresh

Sensors

ID	Name	State	Last value	Last read
0	s0	Normal	0	8.1s
1	s1	Normal	0	8.1s
2	s2	Normal	0	8.1s

The Enable autorefresh button can be used to enable automatic refresh of the readings. In the individual columns of the sensor data table, you can find the data:

- **Name** the name of the sensor as defined in the Sensors tab,
- State status of the sensor:
 - Error reading error (damaged sensor, incorrectly connected, etc.),
 - Normal sensor is providing valid readings that are within normal limits,
 - Warn L low level warning,
 - **Warn H** high level warning,
 - Alert L low level alert condition,
 - Alert H high level alert condition,
- Last value last value read,
- **Last read** time elapsed since last read (value updated continuously with automatic refresh enabled).

Tips

The Sensors window is only displayed in the Status tab after any sensor has been configured in the Sensors tab.

10.2 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 <u>16 Binding</u>
- **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.

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		

10.3 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.

Inputs			
Name	In state	Counter	Action
DI 0	0	0	RESET

11 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.



11.1 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,



• **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 V	Standard V	0	0

Save

11.2 Shutters

This tab allows you to configure the operation of shutters. In shutter control mode, the DAXI device automatically switches one of the two relays, resulting in the opening or closing of the shutter. The following settings can be changed in the individual columns:

- Shutter name user-defined name of the roller shutter,
- **Output up** enables selection of the output which operates the relay that raises the roller shutter,
- **Output down** enables selection of the output serving the relay lowering the roller shutter,
- Time time required to completely open / close the roller shutter, expressed in seconds,
- **KNX read** assignment to a KNX group.

Shutter name	Output up	Output down	Time	KNX read
Shutter 0	None ~	None ~	0	0/0/0
Shutter 1	None 🗸	None ~	0	0/0/0
Shutter 2	None 🗸	None ~	0	0/0/0
Shutter 3	None	None	0	0/0/0

Shutters configuration

Save

11.3 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,
 - o 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 <u>12.2 Inputs</u>.

Physical inputs configuration

No.	Name	Invert	Action type	Parameter
0	DI 0	Standard V	Hold V	600

Save

11.3.1 Types of action: Standard

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



11.3.2 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.



11.3.3 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.



11.3.4 Action types: Toggle

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



11.3.5 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.


11.4 LED

In the LED tab, it is possible to configure the LED signalling settings on the DAXI device.

- **Enable saving mode** this parameter enables activation of the energy saving mode after the specified time (expressed in seconds), the LEDs on the device will be switched off, switching them on again after pressing the RESET button,
- LED #0 .. LED #3 this parameter enables adjusting additional LEDs INFO A, B, C,D (see description in section <u>6.5 Meaning of the LEDs</u>) to react according to the set operation preferences.

LEDs configuration

Name	Value	Description	
Enable saving mode	0	The LEDs will be turned off after the entered time [s]. Wake up by clicking on the reset button.	
	Custom LEDs indicator		
LED #0	0	Custom LED control	
LED #1	0	Custom LED control	
LED #2	0	Custom LED control	
LED #3	0	Custom LED control	

Confirm the settings made with the button

The following commands can be used to program additional LEDs ("x" stands for output channel / input channel / sensor number etc.):

Save

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

11.5 \longrightarrow 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:
 - \circ 1 on.
 - \circ 0 off.
 - \circ n change of state to the opposite.
 - \circ - 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 <u>20.2 HTTPc</u>.

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 <u>20.10 TCP/UDP</u>.

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 <u>20.3 MQTT</u>.

12 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..



12.1 All

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

12.1.1 Control Actions window

Control actions

Operation	Description
Remove all actions	Remove all actions stored in the device memory
Add a new action	Add a new new action to use

- 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:



Create a new action

Current action	Entry
Action name*	Add entry to an action!

Preview of added entries	
There is no assigned entries! Add some	

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
	Input KNX destination group	KNX target group
KNX	Input KNX frame	Content of the KNX frame
	Input server IP	target IP address
UDP	Input server port	port on which the target device listens
	Input data	command sent to target device
	Input server IP	target IP address
ТСР	Input server port	port on which the target device is listening on
	Input data	command sent to target device
	Input server IP/URL address	target IP address/URL
HTTP*	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

MOTT*	Input MQTT topic	topic to which device sends data
MQTT*	Input data	
IO	Input command	command field, list of supported commands -
		see chapter 23 IO commands
Internal	Input log message	message body
log		
E-mail*	Input e-mail receiver	target e-mail address
E-IIIdii*	Input e-mail message	content of e-mail message
	SMS sender	sender of the SMS message
SMS*	Receivers (comma separated)	recipients of the SMS message
	Input SMS message	content of the SMS message
SNMP	Trap syntax	syntax of the notification sent
Trap		

*For detailed configuration of communication via protocols, please refer to the Services tab - see chapter <u>20 Network services (Services)</u>.

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



12.1.2 All available actions and All system actions window

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

Try

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

12.2 Inputs

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

No.	Name	A	ctions
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 <u>11.3 Inputs</u>), 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
Standard	Action On	Action triggers input switching on
	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 <u>11.3 Inputs</u>)
	Action On	Action triggers switching on of the output
Hold	Action Hold On	Action triggers activation of the input for a time longer than specified by the user (in the Parameter field - see chapter <u>11.3 Inputs</u>)
	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 <u>11.3 Inputs</u>)
	Action I	Action is triggered by the specified number of activations occurring in the user-defined time interval (in the Parameter field - see chapter <u>11.3 Inputs</u>)
Cat	Action II	Action is triggered by the defined number of activations occurring in the user-defined time interval (in the Parameter field - see chapter 11.3 Inputs)
Cht	Action III	Action is triggered by the defined number of activations occurring in the user-defined time interval (in the Parameter field - see chapter 11.3 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 <u>11.3 Inputs</u>)
Toggle	Action I	Consecutive pulses at the input trigger Acion I and Acion II
Toggie	Action II	alternately.
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 <u>11.3 Inputs</u>)
Fred	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 11.3 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.

12.2.1 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 12.1 All.



Select action		$\left(\times\right)$
	Number of executions (-1 = infinity)	Number of executions
	Action execution interval [s]	5
НТТР	Delay of action execution [s] Regardless of the state of the trigger I	Delay of action execution
	Delay of action execution [s] The trigger has to be active	Delay of action execution
	Show a	dditional settings Assign action

- **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.

Assign action

Confirm the settings with the button 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.

12.3 KNX

In the Actions/KNX tab, it is possible to define the actions to be taken in response to received data frames on specific groups in the KNX system. With this function, DAXI can be configured to automatically perform certain actions depending on the data received by the KNX system. When DAXI receives a data frame on a selected KNX group (e.g. 1/1/1), it will automatically take the defined actions. For example, depending on the configuration, this could be to send an e-mail to a specific address, to start a specific procedure or to notify users of an event.

First of all, enter the KNX group number and then click on the button

Add a new KNX reaction

, which brings up a dialog with detailed settings. The next step is to select the communication protocol:

Reaction to group: 1/1/1



Preview of added entries	
There is no assigned entries! Add some	

Press the button

Add entry

to select the communication protocol and configure it further

• **Select protocol** – the protocol selection field - the parameters of the individual protocols are described in detail in section <u>12.1.1 Control Actions window</u>.

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

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

12.4 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:

Current action Entry Power up Add entry to an action! Add entry

Preview of added entries	
There is no assigned entries! Add some	

```
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 12.1.1 Control Actions window.

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

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

Add entry

12.5 Periodic

Create a new action: Power up

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

13 Configuration of sensors (Sensors)

This tab allows individual sensors to be assigned to dedicated memory slots and their parameters to be configured in detail. It allows individual management of each sensor, setting specific parameters and modes of operation. In addition, it provides the possibility to view the history of previous readings and download them in JSON or CSV formats.



13.1 All

With this tab, the user has full control over sensor configuration, measurement correction and notification management. It is possible to add new sensors, which automatically integrate with the DAXI system. The user can precisely define the parameters for each sensor, adapting them to their individual needs and operating conditions. In addition, this tab offers tools for editing existing sensors, allowing their settings to be adapted on an ongoing basis to changing conditions or user requirements.

ID	Name	Src	Туре	Log	Alarms			Config	
0	sO	1W	1	0	LL	L	Н	НН	
1	s1	1W	3	0	LL	L	Н	НН	
2	s2	1W	2	0	LL	L	Н	НН	
	h			(+)					

Assign or edit sensors

The individual columns of the sensor table contain the following information:

- ID sensor identification number,
- Name sensor name,
- Src source from which the sensor readings are taken (1-Wire or Modbus poller)
- **Type** type of connected sensor:
 - 。 🕘 temperature sensor,

Save

- $_{\circ}$ @ humidity sensor,
- ₀ 🕘 input,
- 。 🙆 analogue current sensor 4-20mA,
- ● pressure sensor,
- $_{\circ}$ O 0-10VDC analogue voltage sensor,
- **Log** information whether the sensor has active (value 1) or inactive (value 0) readings stored in the device memory
- Alarms activated alarms:
 - LL low level alarm threshold activated,
 - $\circ~$ L low level warning alarm threshold activated,
 - $\circ~$ H high level warning alarm threshold activated,
 - **HH** high level warning alarm threshold activated
- **Config** sensor configuration buttons:



- button for editing sensor parameters,

- delete sensor

After clicking on the button for editing sensor parameters, a dialog box is displayed on the screen:

Go back!

Sensor - ID 0

0

Name	Value	Description
Source	One-wire ~	Select sensor value source
Sensor 1-wire address Scan bus		Sensor 1-wire address
Sensor name	Sens 0	Your custom sensor name
Sensor type	Not defined 🗸	Select sensor type
Sensor hysteresis	0	Sensor hysteresis
Sensor log	Distable ~	Log sensor data in memory
Notifications	~	Enable notifications
MQTT notifications		Enable MQTT notifications

- **Source** the source of the sensor:
 - **One-wire** physically connected to the sensor bus on the Daxi device,
 - **Poller** sensors using the Modbus protocol that are queried by Daxi via the Poller function see section <u>16.1 Poller</u>,
- Sensor 1-wire address the Assign button is used to find and assign the sensor connected to the device,
- Sensor name name of the sensor,
- **Sensor type** type of sensor: temperature sensor, humidity sensor, input, raw value, pressure sensor, voltage detection sensor,
- **Sensor hysteresis** (parameter not active when sensor type Input is selected) applies to alarm and warning states. The hysteresis defines the maximum permissible difference between the alarm/warning value and the return to normal state.

Example:

The alarm value set in the High warning parameter is 30 degrees, the hysteresis is 2 degrees. When the sensor reaches 30° C, the device will enter the sensor alarm state, which will be maintained until the value on the sensor drops to 28° C (30-2=28).

The hysteresis is the interval between activation and deactivation of the alarm / warning, it provides stability by eliminating the possibility of frequent switching of alarm states in case of small fluctuations in the measured value.



- Channel channel selection parameter active only when Input sensor type is selected,
- Sensor log switching on / off the recording of sensor data in the device memory,
- **Notifications** switching on/off of notifications,
- **MQTT notification** enabling/disabling MQTT notifications.

Enabling Notifications allows editing the device's response window to:

- Transition of the sensor into non-alarm and non-error mode
- Transition of the sensor to an error state

The user can choose the type of notification that will be sent in response to the above events. In order for notifications to be sent, the relevant functions must be configured in advance in the Services tab.

Action on normal		Notification	
(+)	E-mail		SNMP Trap
tion triggered on	error state		
tion triggered on	error state	Notification	

To assign an action, click the + button. A dialog box will appear in which you can select the desired action, previously defined in the All tab - see section 12.1 All.

٦

Select action			$\left(\times\right)$
\bigcirc	\bigcirc		\bigcirc
abc	хуz	HTTP	хуz
		UDP	ТСР
		Show additional set	ings Assign action

The procedure for assigning an action is described in detail in chapter 12.2 Inputs

13.1.1 Alarm configuration

In the settings section dedicated to the configuration of sensor alarms, the user gains full control over the customisation of alarm parameters. This allows you to configure precise alerts and responses to significant sensor events.

Low alarm	Low alarm value 0
Low warning	Low warning value 0
High warning	High warning value 0

ſ

High alarm	High alarm value	0	

- Low alarm activation of the low level alarm,
- Low alarm value the sensor value at which the sensor will go into alarm,
- Low warning activation of low level warning, approaching alarm state,
- Low warning value the sensor value at which the sensor will go into warning state,
- High warning activation of high level warning, approaching alarm state,
- High warning value sensor value at which the sensor will go into alarm state,
- High alarm activation of high level alarm,
- High alarm value sensor value at which the sensor will go into a warning state,

When an alarm is activated, an additional window appears that allows the user to customise the device's response to the alarm situation. Here, the user can configure notifications and assign the execution of a specific action (see section 12.1 All)

Sensor corrections final = a * (x + preoffset) + b							
Sensor preoffset	0	Sensor preoffset correction					
Sensor multiplication 'a'	1	Multiplying sensor value					
Sensor offset 'b'	0	Constant value correction					

- **Sensor preoffset** this field is used for sensor preoffset correction, according to the formula of the linear function f(x)=ax*b,
- Sensor multiplication 'a' multiplying sensor value,
- **Sensor offset 'b'** correction of a constant value.

13.2 History

This tab enables you to activate and configure the recording of the history of sensor readings:

History configuration

Name	Value	Description
History		Enable measurement recording
Wait for SNTP		Records data only when SNTP time is active Go to the SNTP configuration
Period	60	Save data from sensors every defined time [s]
Remove	30	Remove logs older than (days)

- **History** enable/disable recording of sensor readings,
- Wait for SNTP enabling this option will cause data from sensors to be recorded only when the <u>device downloads time</u> from SNTP server after restart,
- **Przycisk** Go to the SNTP configuration allows access to the tab for SNTP configuration see chapter 20.8 SNTP
- Period frequency of sensor data recording,
- **Remove** allows you to activate the clearing from memory of records older than a specified number of days.

Tip In order for the sensor data to be stored in the device memory, the data logging function must be activated - Sensors / All tab, Sensor log parameter (available in the sensor editing mode).

13.3 Chart

The tab shows the reading graphs of all sensors that have data logging attached (Sensors / All tab, Sensor log parameter).

Preview of historical data



- Refresh data download the current sensor readings,
- **Download JSON** download stored readings in JSON format,
- Download CSV download stored readings in CSV format,
- **Remove X oldest logs** remove X oldest recorded sensor measurements from the device memory.
- **Clear history** clearing the device memory of all recorded measurements from the sensor.

13.4 \longrightarrow Operating the sensor

To be sure of accurate and reliable sensor readings, it is recommended to follow the detailed step-by-step guide below, covering connection, assignment and configuration of the sensor.

13.4.1 Assigning the sensor

First connect the sensor to the device - see section <u>6.4 Connection diagram</u>. Then, using the device's website, you must locate, assign and configure the sensor's basic parameters. If no sensors have been connected to the DAXI device before, you can use the option to automatically assign them. Simply reset the device after connecting the sensors. When DAXI restarts, it will automatically recognise and assign the available sensors, also specifying their type.

The step-by-step process of manually configuring the sensors is described below.

Step 1: Under Sensors / All - click the + button:

ID	Name	Src	Туре	Log	Alarms	Config			
	+								
Go b	pack!					Save			

Assign or edit sensors

Sensor - ID 0

Name	Value	Description
Source	One-wire ~	Select sensor value source
Sensor 1-wire address Scan bus		Sensor 1-wire address
Sensor name	Sens 0	Your custom sensor name
Sensor type	Not defined 🗸	Select sensor type
Sensor hysteresis	0	Sensor hysteresis
Sensor log	Enable ~	Log sensor data in memory
Notifications		Enable notifications

In the dialog box that appears, the first step is to select the source of the sensor - the Source parameter. In this case, select One-wire (sensor physically connected to the Daxi bus).

Assign a sensor by starting with the icon sensors detected by DAXI that are connected:



Assign the selected sensor by clicking on the Assign button.

Step 2: Configure the basic parameters.

In the sensor configuration window, the correct sensor type must be set, a name can be

given, etc. All settings should be confirmed with the button

Krok 3: Preview in the Status tab

A correctly configured sensor will result in the readings being displayed in the Status tab of the Sensors window:



Save

Sensors

ID	Name	State	Last value	Last read
0	sO	Normal	0	8.1s
1	s1	Normal	0	8.1s
2	s2	Normal	0	8.1s

13.4.2 Storing sensor readings and viewing the graph

Performing the sensor configuration according to the instructions in the previous chapter does not guarantee that the readings are automatically stored in the device's memory. They only allow a current view of the values. To ensure that the sensor data is periodically recorded, follow the next steps:

Step 1: Enable automatic recording of sensor readings

- Sensors / All tab, click on the edit sensor parameters button

Assign or edit sensors

ID	Name	Src	Туре	Log		Alar	ms		Config
0	sO	1 W	(8)	0	LL	L	Н	НН	
1	s1	1 W		0	LL	L	Н	НН	
2	s2	1 W	(8)	0	LL	L	Н	НН	

- Sensor configuration screen is displayed:

Sensor - ID 0

Name	Value	Description
Source	One-wire ~	Select sensor value source
Sensor 1-wire address		Sensor 1-wire address
Sensor name	Sens 0	Your custom sensor name
Sensor type	Not defined 🗸	Select sensor type
Sensor hysteresis	0	Sensor hysteresis
Sensor log		Log sensor data in memory
Notifications		Enable notifications

Go to Sensor log and select the Enable parameter. Confirm all settings with the button

Step 2: Enable automatic logging of readings

- Sensors / History tab,

History configuration	configuration		
Name	Value	Description	
History		Enable measurement recording	
Wait for SNTP		Records data only when SNTP time is active Go to the SNTP configuration	
Period	60	Save data from sensors every defined time [s]	
Remove	30	Remove logs older than (days)	

Go to History and activate it using the slider.

When the device is rebooted or the internet connection fails, it will automatically switch to recording sensor readings using the internal real-time clock (RTC). The Wait for SNTP option allows the unit to wait for the current time to be downloaded from the network time server (SNTP) before starting to record sensor data. This ensures the time accuracy of the measurements, even if there is no internet connection.

All settings should be confirmed with the button

Save

Step 3: Setting the current time on the device

The Daxi device is equipped with an internal RTC clock with battery backup. If the device has permanent access to the Internet, the SNTP service can be switched on (see chapter <u>20.8 SNTP</u>).

- Services / SNTP - Enable tab, the tab allows you to set the SNTP time server, which ensures that the current time of the device is maintained despite a power failure

SNTP configuration

Name	Value	Description
SNTP		Enable SNTP client
Server		SNTP server address
Poll time	86400	Server poll time (secs)

Save

All settings should be confirmed with the button

Once the unit has been configured according to the above instructions, the unit will start to save the sensor data to the internal memory. The module also allows you to view a graph of how the values read from the sensor have changed over time. You can also download the stored readings in JSON or CSV form.

13.4.3 Downloading stored sensor readings

Stored sensor readings (see previous section) can be downloaded from the device in JSON or CSV format by referring to the device's internal memory resource. Use the following command for this purpose: http://adres_IP_urządzenia/data/log.json.

Sensor readings can also be downloaded directly from the device page in JSON or CSV format.

To do this, use the corresponding buttons:	Download JSON	or	Download CSV in the	3
Sensors / Chart tab.				

14 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 <u>14.1 Sensors</u>, <u>14.2 Inputs</u> and <u>14.3 Outputs</u> 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 <u>20 Network services</u> <u>(Services)</u>.
- **Step 3.** Enable the notification option in the Configuration tab see chapter <u>14.4 Configuration</u>

14.1 Sensors

In the Sensors tab, it is possible to adjust the notification settings related to the operation of individual sensors. Notifications for the selected sensor can be activated in two ways: in the Sensors tab, during the configuration of the sensor (see chapter <u>13 Configuration of sensors</u>

(Sensors)) or by clicking on the icon \checkmark in the Notifications / Sensors tab.

Full personalisation is possible in the configuration window that appears when the notifications function is activated:

	s0				
	State	E-mail	SMS	SNMP Trap	MQTT
	Info				
	OK				
	Error				
Ø	Alarm low (disabled)				
Ø	Warning low (disabled)				
Ø	Warning high (disabled)				
Ø	Alarm high (disabled)				

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



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 <u>20 Network services (Services)</u>.

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

- Info periodic information about the state of the sensor,
- **OK** state of sensor's return to normal operation in a previous error or alarm state,
- Error state of sensor error,
- Alarm low state of low level alarm value,
- Warning low state of warning value by approaching low level alarm,
- Warning high state of warning value by approaching high level alarm,
- Alarm high sensor reaching a high level alarm value.

If alarm limits have not been previously set for the sensor, this can be done here using the icon 0, which opens a window that allows you to enter the desired value:



After entering the desired value, activate the function by clicking the icon . The settings made here will also be visible in the Sensors tab.



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 <u>14.4 Configuration</u>

14.2 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.



Aby powiadomienia E-mail, SMS, SNMP Trap oraz MQTT działały prawidłowo należy dokonać szczegółowej konfiguracji tych opcji w zakładce Services – patrz rozdział <u>20 Network services</u> (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.

```
I 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 <u>14.4 Configuration</u>

14.3 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 \checkmark , 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:

	I	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.

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 <u>20 Network services</u> (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.

	In order to activate the notification function, it is important that, in
Tip	addition to the settings made here, this option is also activated on the
	Configuration tab - see section <u>14.4 Configuration</u>

14.4 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	
E-mail info	86400	E-mail info time [s]	
SMS info	86400	SMS info time [s]	
MQTT info	60	MQTT info time [s]	
MQTT Retain		Set MQTT Retain flag	
SNMP Trap	0	SNMP user trap	
IO time	100	Minimum time before sending another state change for inputs and outputs [ms]	

- **Notification** activation / deactivation of notifications
- **E-mail info** frequency of sending e-mail messages with information on the status of the sensor / input / output
- SMS info frequency of sending SMS messages with information on state of a sensor / input / output
- 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,
- SNMP Trap SNMP Trap selected
- **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.

User manual DAXI

Sensor			
E-mail	[%s[?].name%]=%s[?].val% s[%s[?].idx%] %s[?].statTxt%	E-mail sens subject	
SMS	Sensor%s[?].idx%=%s[?].val% %s[?].name% %s[?].statTxt%	SMS sens message	
MQTT	daxi/c09bf4a003a2	MQTT sens topic	

Inputs			
E-mail	[%i[?].name%]=%i[?]% i[%s[?].idx%]	E-mail input subject	
SMS	Input%i[?].idx%=%i[?]% %i[?].name%	SMS input message	
MQTT	daxi/c09bf4a003a2	MQTT input topic	

Outputs			
E-mail	[%o[?].name%]=%o[?]% o[%s[?].idx%]	E-mail output subject	
SMS	Output%o[?].idx%=%o[?]% %o[?].name%	SMS output message	
MQTT	daxi/c09bf4a003a2	MQTT output topic	

15 Work matrix

15.1 KNX outputs

In the Work matrix/KNX outputs tab, it is possible to program the behaviour of the output in response to data frames sent to specific groups in the KNX system. This function allows DAXI to be configured to automatically control the outputs depending on the data received by the KNX system.

When DAXI receives a data frame on a selected KNX group (e.g. 1/1/1), it automatically performs the assigned action, such as switching on, switching off, changing to the opposite state or temporarily switching on. This allows the user to precisely control the behaviour of the device depending on the KNX signals.

Advanced configuration					
Ch	annel 0: DO 0				(+)
	On	Off	Invert	Time	
KNX c	group	KNX group	KNX group	KNX group	
Pressing the Advanced configuration button will display a modified configuration view, allowing the command path to be copied easily Advanced configuration					
No.	Name	KNX			
1	DO 0	1/1/1:a,1/1/2:b,1/1/3:c,1/1/4:d			
List of KNX commands recognised by DAXI: On - switching on the output - can take 2 values: • 0 - sending such a command will switch the output off • 1 - sending such a command will switch the output on Off - turning the output off - can take 2 values: • 0 - sending such a command will switch the output on					

- 0 sending such a command will switch the output on
- 1 sending such a command will switch the output off
- **Invert** changing the status of the output to the opposite
 - 0 such command will not change the output's state
 - 1 sending such a command will change the status of the output to the opposite

Time – temporary switching on/off of the output

- 00 switching off the relay
- 01 TonMSB TonLSB ToffMSB ToffLSB switching on the relay for a fixed time after the specified delay. This time is expressed in units equal to 0.1 seconds, written in hexadecimal (hex).

Example:

Switching the relay on for 60 seconds (value 600), after an 8 second delay (value 80):

- dec 600 ---- hex 0x02 0x58
- dec 80 ---- hex 0x00 0x50

Syntax:





Physical inputs

To program the relay switch on without a delay, simply do not enter a value for $T_{\text{off}},$ e.g.: 010258.

15.2 Inputs all in one

The tab allows the reaction of the device to the signal received at the selected input to be programmed. The KNX, UDP and TCP protocols can be used for this. After selecting the protocol, the remaining settings must be defined: Destination and enter the command.

Channel 0: DI 0				
Function	Protocol	Destination	Frame	Config
Action Off	None ~			
Action On	None ~			

Depending on the type of input (Action type parameter in the I/O Settings / Inputs tab - see <u>11.3 Inputs</u>), a different number of functions are available.

Go to the inputs configuration The button in the top right corner allows quick access to the IO Settings/Inputs tab see section <u>11.3 Inputs</u>.

16 Binding

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

16.1 Poller

Poller is a software function that regularly retrieves data of another system, device or application using the Modbus TCP or Modbus RTU protocol. The principle of the poller is to send a request to a specific target and wait for a response.

Clicking on the button will bring up further dialogues with detailed settings:

Device settings:



Create a new poller instance

Devic	e settings Next >
Poller name	name
Protocol	Modbus TCP Y
Layer	TCP ~
Device PDU	1
Connection timeout [ms]	1000
Response timeout [ms]	200
IP address	e.g. 192.168.0.90
Port	502

- Poller name
- **Protocol** communication protocol for poller:
 - Modbus TCP
 - Modbus RTU
- Layer
 - **TCP** (optional for Modbus TCP protocol),
 - **UDP** (optional for Modbus TCP protocol),

- **RS485/RS232** (optional for Modbus RTU protocol),
- **Device PDU** number of the device being checked,
- Connection timeout [ms] (option for Modbus TCP protocol only), connection timeout [ms],
- **Response timeout [ms]** response timeout [ms],
- IP address (option only for Modbus TCP protocol) IP address of the examined device,
- Port (option only for Modbus TCP protocol) port for communication with the device being checked.

Clicking the button will take you to the next parameter window.

Data:

Create a new poller instance



- Start register address the address of the initial register,
- Number of registers the number of registers,
- **Register type** the type of register:
 - Coils
 - Input Register 16-bits
 - Holding Register 16-bits
 - Discrete Inputs
- Refresh interval [s] refresh interval [s],
- Writable recordable.

Mappers

Create a new poller instance



A Back	Mappers	
Mapper name		Mapper name to reference
Offset	0	Register offset in the poller
Format	Convert to signed integar 16 bits	Select variable format
Multiplication	1	Scal your sensol value
	Mappers	Add mapper

- Mapper name the name of the mapper,
- **Offset** the offset of the register,
- Format selection of the format of the variable:
 - Convert to signed integer 16 bits
 - Convert to unsigned integer 16 bits
 - Convert to signed integer 32 bits
 - Convert to unsigned integer 32 bits
 - Swap registers and convert to signed integer 32 bits
 - Swap registers and convert to unsigned integer 32 bits
 - Convert to floating-point 32 bits
 - Swap registers and convert to floating-point 32 bits
- **Multiplication** scaling of sensol values.

The button Go to the sensor configuration allows quick access to the Sensors/All tab.

16.2 Outputs

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

No.	Name	KNX read	Route to
0	D0 0	0/0/0	0[2]
1	DO 1	0/0/0	
2	DO 2	0/0/0	
3	DO 3	0/0/0	
4	DO 4	0/0/0	
5	D0 5	0/0/0	
6	D0 6	0/0/0	
7	D0 7	0/0/0	

Physical outputs configuration

Virtual outputs configuration

No.	Name	KNX read	Route to
8	VO 8	0/0/0	0[2]
9	VO 9	0/0/0	
10	VO 10	0/0/0	
11	VO 11	0/0/0	

- Name allows the output to be renamed,
- **KNX read** allows the output to be assigned to a KNX group a change of state of the output will cause the data frame to be sent to the entered KNX group,
- **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.

16.3 Inputs

The tab allows inputs (both physical and virtual) to be assigned to specific KNX groups:

Physical inputs configuration

No.	Name	KNX read
0	DIO	0/0/0
1	DI 1	0/0/0
2	DI 2	0/0/0
3	DI 3	0/0/0
4	DI 4	0/0/0
5	DI 5	0/0/0
6	DI 6	0/0/0
7	DI 7	0/0/0
Virtual inputs configuration

No.	Name	KNX read	Route from
8	VI 8	0/0/0	
9	VI 9	0/0/0	
10	VI 10	0/0/0	
11	VI 11	0/0/0	

- Name enables the input to be renamed,
- KNX read allows the input to be assigned to a KNX group - changing the state of the output will send a data frame to the KNX group entered,
- Route from

17 Scheduling activities (Schedule)

In the Schedule tab, we can customise the operation of the system by using cron time. This advanced function allows flexible programming of various actions, such as switching on or off operation, defining latitude and longitude for precise synchronisation with the movement of the sun (sunrise and sunset). In addition, the ability to assign specific actions to specific cron times allows you to configure a personalised schedule for the system.

17.1 Cron standard

Cron advanced		Enable cron advanced
Advanced cron	45 13 * * * 11111111	Control device outputs with standard Cron expression
Cron expression	****	Test your cron expression here

- Cron advanced enable/disable advanced cron handling,
- Advanced cron control of device outputs with standard Cron expression,
- **Cron expression** enables checking the correctness of the set Cron time the correctness of the expression is indicated by the colour of the frame (red expression entered incorrectly, green expression entered correctly).

Entering settings consists in filling in six columns.

The figure below shows the meaning of the successive columns.

* * * * * Control command

L		Day of the week (0-7) (0 and 7 Sundays)
		Month (1-12)
		Day of the month (1-31)
L		Hour (0-23)
-		Minute (0-59)

The control command consists of 8 fields representing the status of the corresponding outputs. Each half can take values::

- 1 activation of the output
- 0 switching off the output
- n negation (if it was switched on it will be switched off and vice versa)
- - leave the output unchanged

Example:

Output	1	2	3	4	5	6	7	8
State	1	1	0	1	n	1	-	0

- switch on output 1,2,4,6
- switching off output 3,8
- negation of the output 5
- output 7 left unchanged

The controller recognises the following entries:

- Sunday can be indicated as 0 or 7
- the day on which the command is executed can be entered in two ways: by specifying the day of the month or the day of the week. If both fields are set, the command will be executed on both the set day of the month and the set day of the week!
- Numerical values can be entered in different formats:
- 1-3 i.e. values 1,2,3
- 0-10/2 i.e. values 0,2,4,6,8 and 10 (every second value from 0 to 10)
- 1,2,5 i.e. the values 1,2,5 in turn
- */2 every 2nd allowed value (e.g. in the first column it will be 0,2,4,6...56,58)
- 1-3,5,6 i.e. 1,2,3 and 5 and 6
- SR reference to sunrise time
- SS reference to sunset time

changing from summer to winter time it will execute twice (between 2:00 and 3:00 and 2a:00 and 3a:00).
--

Examples:

switching on the third relay at 12:45:

45 12 * * * --1-----

switching on the fifth relay at 17:30 on 16 October:

00 8 * * 1-5 -1----switching on the second relay Monday to Friday at 8:00:

switching on the first relay and switching off the fifth relay Monday to Friday at sunrise: SR SR * * 1-5 1---0---

switching on relay one at dusk and switching off at dawn:

switching on relay three 10 minutes after dawn

17.2 Configuration

The tab allows the configuration of output control using Cron time.

Cron expression configuration

Name	Value	Description
Cron action		Enable cron action
Twilight	Sunrise/set(-0.58°) ×	Select twilight type
Longitude	19	° (W-,E+)
Longitude	8	' (W-,E+)
Latitude	49	° (S-,N+)
Latitude	51	' (S-,N+)

- **Cron action** enabling/disabling of the Cron service,
- **Twilight** selection of twilight type see chapter <u>17.3 Twilight type</u>,
- **Longitude** degrees (positive value for eastern longitude, negative value for western longitude),
- Longitude minutes (positive value for eastern longitude, negative value for western longitude),
- Latitude degrees (positive value for northern latitude, negative value for southern • latitude),
- Latitude minutes (positive value for northern latitude, negative value for southern latitude),



SR+10 SR * * * --1----

17.3 Twilight type

Civil (-6°) - civil twilight - the phase of sunset at which the centre of the solar disk is no more than 6 angular degrees below the horizon. During this period, the brightest stars and planets appear in the sky, preserving enough natural light for normal outdoor activities.

Nautical (-12°) - Nautical twilight (also called dusk) - the time after sunset when the centre of the solar disk is less than 6 angular degrees below the horizon, but still above 12°. This phase allows the horizon line to be clearly observed, which is important in astronavigation, enabling simultaneous navigation based on terrestrial and celestial objects.

Astromical (-18°) - astronomical twilight - the period when the centre of the solar disk is between 12 and 18 angular degrees below the horizon. It ends with the beginning of astronomical night.

Astronomical dawn - the time before sunrise when the sun's rays light up the sky, making the faintest stars no longer visible. The astronomical dawn lasts from the time the centre of the Sun's disc is above 18° below the horizon line until it is above 12° below the horizon line. The astronomical dawn ends the astronomical night and then the nautical dawn begins.

Nautical dawn - the time before sunrise when the horizon and landscape become visible, allowing navigation based on illuminated objects on land or sea. During this time, the brightest stars are still visible in the sky. Nautical dawn lasts from the time the centre of the Sun's disc is more than 12° below the horizon line, but still less than 6° below the horizon line.

Civil dawn - the time before sunrise when the centre of the Sun's disc is already more than 6° below the horizon line.



The DAXI device calculates the time of sunrise and sunset - for this it is necessary to enter the geographical coordinates (longitude and latitude in degrees minute format).

Twilight - selection of astronomical clock mode

- **Sunrise/set** (-0,58°),
- **Civil (-6°)** civil twilight,
- Nautical (-12°) nautical twilight,
- Astronomical (-18°) astronomical twilight.

18 Ping of remote hosts (Watchdog)

The DAXI device has a "pinging" function. - can ping remote hosts (other network devices, servers...) and respond to their availability.



To add a new device to the availability check, click on the + sign in the All ping pong actions table - a new Create a new ping feature dialog box will be displayed:

- Name ping name
- IP address IP address of the pinged device,
- **Interval** frequency of sending ping expressed in seconds
- Timeout time limit for a ping response,
- **Error tolerance** maximum acceptable number of ping response errors before transition to error state

Create a new ping feature

Name	Value	Description
Name	ping name	Input ping component name
IP Address	IP address	Input the IP address of the pinged device
Interval	5	Input period between pings in seconds
Timeout	1	Input timeout for ping response
Error tolerance	max acceptable errors	Input max acceptable errors response for ping before changing to error state

After entering all settings, confirm them with the button \checkmark - the newly created ping will appear in the table and in the columns Actions ping OK and Actions ping Error the + buttons will appear for assigning selected actions to be performed in case of a correct ping response and in case of an error - the process of assigning actions see section <u>12.2.1 Assigning an</u> <u>action</u>.

19 Logic functions (Logic)

The Logic tab allows you to configure logical functions - when certain conditions are met, a specific reaction will be triggered.

Add a condition

To configure a new logical function, use the button

New condition

if A Source IN	✓ 0 €	= ∨ B Source	IN	✓ 0 €
Logical operator AND ~				
if C Source IN	~ 0 \$	■ → D Source	IN	✓ 0 €
Result True None ~				
Result False None ~				

Available logical variables:

- **IN** input
- **IN_cnt** input counter
- **OUT** output
- Sens sensor
- Sens_stat sensor value
- **Constant** constant
- Virt virtual
- IN_active_action

Result True / Result False - reaction to condition fulfilled / condition not fulfilled:

- None no reaction,
- **Output** activation of the output,
- Action calling the defined action (see chapter <u>12 Defining tasks (Action)</u>,
- Virtual driving a virtual output / input.

Example: **New condition** ٢ Source if Α Source В 25 韋 Sens \sim 0 $\geq \checkmark$ Constant \sim Logical operator _ \sim 7 🗘 1 🗘 **Result True** Output ~ id value -**Result False** 7 value Output 🗸 id 0

Output 7 will be switched on whenever the temperature at sensor 0 is greater than or equal to 25. If the temperature falls below this value output 7 will be switched off.

20 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:



Save

20.1 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 Server configuration

Name	Value	Description			
HTTP port	80	HTTP access port			
HTTPS port	443	HTTPS access port			
SSL/TLS		Enable encryption			
SSL Server certificate					
SSL Key file (pem)	Wybierz plik Nie wybrano pl	iku Upload			
Certificate file (pem)	Wybierz plik Nie wybrano pl	iku Upload			

• **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)

20.2 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	1	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
 - o **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		

- 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.

20.3 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.

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

MQTT Client configuration

- 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 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** 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.
💶 Тір	Please ensure that the topic you assign is unique, e.g.: /Hero/ MAC address.

20.4 E-mail

This section configures the parameters for the connection to the e-mail server, allowing emails to be sent automatically in response to specific events or alarms.

E-mail configuration

Name	Value	Description
E-mail		Enable E-mail
Server		SMTP server address
Port	0	Port
SSL/TLS	Off ~	Encryption
User		E-mail sender address e.g.: example@example.com
Authorization	None ~	Enable e-mail authorization
From	Mailer	E-mail from field e.g.: Johnny Bravo

- Enable enable/disable e-mail service,
- Server address of the SMTP server,
- **Port** port of the mail service,
- **SSL/TLS** enable/disable encryption,
- **User** user name,
- **Password** password,
- From sender's e-mail address,

Debug		Enable debug e-mail messages
Subject	%mod_name%	E-mail subject
Recipients (comma separated)	E-mail recipient for a to	est
Send test e-mail	Before sending Op	a test email, save your settings. <u>en debbuger here!</u>

- Recipients (comma separated) list of recipients of emails (separated by commas), ٠
- Subject subject of the email to be sent,
- **Debug** enable the message debugging function, **Send a test e-mail** send a test e-mail. •
- •

20.5 SMS

The DAXI device can be configured to send SMS messages in response to specific events or with information on e.g.: an alarm.

SMS API configuration

Name	Value	Description
SMS service		Enable SMS service
Provider	SMSAPI.pl	Select SMS API provider
Token API	~	Token API (OAuth)
Limit	0	Daily limit of requests to SMS service. 0 to disable
From		
Recipients (comma separated)		
Send test SMS	Before sending Op	a test SMS, save your settings. en debbuger here!

Save

• **Provider** – This parameter specifies the SMS service provider with which the API is integrated:

• SMSAPI.pl

- **Token API** a unique authorization key which is used to verify access and communication with API of SMS service provider
- Limit daily limit of SMS messages, entering 0 will disable the SMS sending option,
- **From** defines the sender of the SMS message; this can be a predefined name, phone number or other identifier that will be visible to the recipient of the message,
- Recipients (comma separated) a list of recipients' phone numbers to which messages are to be sent; numbers should be separated by commas,
- **Send a test SMS** this option allows you to send a test SMS message in order to verify the correctness of the configuration and operation of the service.

20.6 Modbus

Data from the device can be read and written via the MODBUS TCP protocol. The DAXI device supports the following MODBUS functions:

- 0x01 Read Coils,
- 0x02 Read Discrete Inputs
- 0x03 Read Holding Register,
- 0x04 Read Input Register,
- 0x05 Write Single Coil,
- 0x06 Write Single Register,
- 0x0F Write Multiple Coils,
- 0x10 Write Multiple Registers

Name	Name Value		Description
Modbus TCP			Enable modbus TCP
TCP Port	502	•	Modbus TCP Port (default 502)
Modbus RTU			Enable modbus RTU
PDU	1		
RTU Baudrate	9600	~	
RTU Parity	None	~	
RTU Stop bit	1	~	
Block RFID read	Continous	~	Block next RFID read until unlock

Modbus configuration

- Enable TCP enable/disable Modbus TCP protocol support,
- TCP Port Modbus TCP port (default 502),
- Enable RTU enable/disable Modbus RTU protocol support,
- PDU
- RTU Baudrate RTU baud rate,
- RTU Parity RTU parity,
- RTU Stop bit "stop bit",
- **Block RFID read** Blocking the next RFID read until it is unlocked.

The contents of the registers are shown in the following tables:

Read Coi	Read Coils		
Address	R/W	Description	
1	R/W	Output status 0, switching on (in user-defined mode) / switching off	
		output 0:0-off,1-on	
2	R	Output status 0	
3-4		as above concerns the output 1	
4		as above - applies to further outputs	

Read Discrete Inputs		
Address	Name	Description
1	input0 state	Input status 0
2	Input2 state	State of subsequent inputs
	•	

Read Hole	ding Re	egisters
Address	R/W	Description
1	R	Input 0 activation counter
2	R	Counter for consecutive inputs
•		
200		
201	R/W	Output status 0, switching on (in user-defined mode) / switching off output 0:0-off,1-on
202	R	Output operation mode 0: 0 - disable 1 - bistabile 2 - astabile 3 - one pulse
203	R	value Time on
204	R	value Time off
205-209		as above applies to output 1
210		as above - applies to further outputs

Read Input Registers			
concerns the	Address		
sensor:			
	1	 0 - reading error (damaged sensor, incorrectly connected, etc.), 1 - sensor is providing correct readings that are within normal limits, 2 - warning of approaching low level, 2 - warning of approaching high level elements 	
sor 0		3 - warning of approaching high level alarm,	
		4 - low level alarm condition,	
		5 - high level alarm condition,	
Ň	2	sensor value*10	
	3	sensor value float	
	4		
	5	time of last sensor reading	
	6	time of last sensor reading	
Sensor 1	7-12	i.e. applies to sensor 1	
Sensor 2	13	as above for the following sensors	

20.7 SNMP

This section allows the configuration of parameters for the SNMP protocol, used to monitor and manage devices on the network. The module is equipped with an SNMP v2c and v3 server. Depending on the choice of SNMP version, different setting parameters are available.

20.7.1 SNMP v2c

SNMP configuration

Name	Value	Description
SNMP		Enable SNMP
SNMP version	2c ~	Select SNMP version
sysDescr		
sysContact		
sysName		
sysLocation		
Read community		SNMP v2c only
Write community		SNMP v2c only
Show	SNMP User Trap	Show

- Enable enable/disable SNMP support,
- **SNMP version** SNMP version: v2c or v3,
- sysDescr
- sysContact
- sysName
- sysLocation
- Read community password for reading data (only applies to SNMP v2c),
- Write community password for writing data (only applies to SNMP v2c),

SNMP User Trap (window only visible for SNMP v2):

Hide	SNMP User Trap	Hide	
User TRAP 0			
Write community			
IP	0.0.0.0		
User TRAP 1			
Write community			
IP	0.0.0.0		
User TRAP 2			
Write community			
IP	0.0.0.0		

MIB file

- •
- Write community password for writing data, Trap IP address to which trap messages will be sent. •

20.7.2 SNMP v3

SNMP configuration

Name	Value	Description
SNMP		Enable SNMP
SNMP version	3 ~	Select SNMP version
sysDescr		
sysContact		
sysName		
sysLocation		
EngineId		
Show	SNMP User	Show
Show	SNMP User Trap	Show

MIB file

- Enable enable/disable SNMP support,
- **SNMP version** SNMP version: v2c or v3,
- sysDescr
- sysContact
- sysName
- sysLocation
- **EngineId** unique identifier of the device (only applies to SNMP v3),

SNMP User:					
Hide	SNMP User	Hide			
	User 0				
Username					
Secure Level	noAuthnoPriv ~				
Auth Protocol	no v				
Authorization Key					
Priv Protocol	no v				
Private Key					
Writable	Disable	Writable			

The parameters that can be set in this window allow authentication and privacy mechanisms to be defined for different users.

- Username the name of the user,
 - **Secure Level** selection of the security level:
 - **noAuthnoPriv** SNMPv3 communication takes place without any security,
 - **authNoPriv** SNMPv3 communication authenticated but unencrypted,
 - **authPriv** SNMPv3 communication authenticated and encrypted,
- Auth Protocol choice of protocol for message authentication:
 - ° no

•

- **md5**
- sha
- Authorization Key authorization key,
- Priv Protocol:
 - ° no
 - des
 - aes
- Private Key
- Writable giving the user permission to send messages to the device.

SNMP User Trap		
Hide	SNMP User Trap	Hide
	User TRAP 0	
IP	0.0.0.0	
Username		
Secure Level	noAuthnoPriv ~	
Auth Protocol	no	
Priv Protocol	no v	
Authorization Key	~	
Private Key		
Engine ID		

The parameters that can be set in this window relate to the specific trap messages generated for or by a particular user.

- IP the IP address of the device or system that generates the trap message,
- Username the name of the SNMPv3 user,
 - **Secure Level** the security level used for SNMPv3 communication:
 - o noAuthnoPriv SNMPv3 communication takes place without any security,
 - authNoPriv SNMPv3 communication authenticated but unencrypted,
 - authPriv SNMPv3 communication authenticated and encrypted,
- **Auth Protocol** authentication algorithm used to verify user identity:
 - o no
 - **md5**
 - o **sha**
- **Priv Protocol** encryption algorithm used to ensure privacy of the message:
 - o **no**
 - \circ des
 - o aes
- Authorization Key the key used in the authentication process,
- Private Key a private key,
- **Engine ID** a unique identifier used to represent the SNMP engine instance on the device.

Download MIB file – link to download the MIB file.

20.8 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.

SNTP configuration

Name	Value	Description
SNTP		Enable SNTP client
Server	194.146.251.100	SNTP server address
Poll time	1	Server poll time (secs)

Save

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

	Examples of SNTP servers:
Tip	 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 section <u>21.3 Time</u>.

20.9 Syslog

In this section, you can configure the sending of system logs to an external syslog server, which facilitates remote diagnostics and monitoring of the device's operation.

Syslog configuration

Name	Value	Description
Syslog		Enable syslog
Server		Server address
Port	1	Server UDP port (default 514)
System events		Send system events to syslog.
Syslog IO		Send all IO events to syslog.

- Enable Enable the Syslog client service,
- **Server** address of the Syslog server entered in the form of an IP or domain number with a maximum length of 24 characters,
- **Port** the port number on which the Syslog server listens,
- System events refers to events related to the functioning of the system itself,
- Syslog IO -

20.10 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/UDP server configuration

Name	Value	Description
TCP server		Enable TCP server
TCP Port	502	TCP server port
UDP server		Enable UDP server
UDP Port	502	UDP server port

Save

- 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.

21 System administration (Administration)

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



21.1 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 	
1		

21.2 Network

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

21.3 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

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

The DAXI 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 <u>20.8 SNTP</u>).

21.4 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.

Log events to flash settings

Name	Value	Description
Flash log		Enable system events write to flash
Log system events		Log Power-On, time changes, reset to default, reboots, config changes
Log network events		Log network events

• **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.

21.5 Backup

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

Create a backup file	
Enter password	Enter uour backup password
Re-type password	Repeat your backup password

Download

Save

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

The button

Download

allows you to save the backup to your computer.

Restore		
Backup password	Repeat your backup password	Enter your backup password
Backup file	Wybierz plik Nie wybrano pliku	Upload
 Backup password – password for the backup to be uploaded Backup file – button for searching the backup file 		
The button Upload Button Reboot ena	will upload the selected backup to the devibule of the devibule of the device.	ice.

Reset to default restores the factory settings of the device.

21.6 Update

Button

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.



22 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%	<pre>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</pre>
%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

User manual DAXI

%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]%	%0[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

23 IO commands

Below is a summary of the commands used to create actions based on IO commands (see section 12.1 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	1 - on
	controls all outputs	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	ch - output number
0	output on or off	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	off command to turn the	ch - output number
output on for a specified period	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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