Inveo Sp. z o.o.

Hero Web Sensor

Instruction Manual

Overview

Warning

This manual applies only to the firmware version v1.36 onwards. Inveo does not guarantee that the information contained in this document applies to previous firmware revisions.



Purpose of the device

The HERO module has been designed specifically to monitor a variety of parameters, including temperature, humidity, and digital signals, allowing comprehensive monitoring of environmental conditions.

The device allows the connection of up to four sensors of different types, providing flexibility and the possibility to adapt the monitoring to specific user needs.

Temperature readings are easily accessible both by the built-in web page and communication protocols such as HTTP GET, Modbus TCP, SNMP and MQTT, making integration with different monitoring and control systems easy.

Additionally, the device has the function of sending signals to other Inveo modules when set temperature thresholds are exceeded. This makes remote control of relays and other devices possible when abnormal environmental conditions are detected.

Changelog

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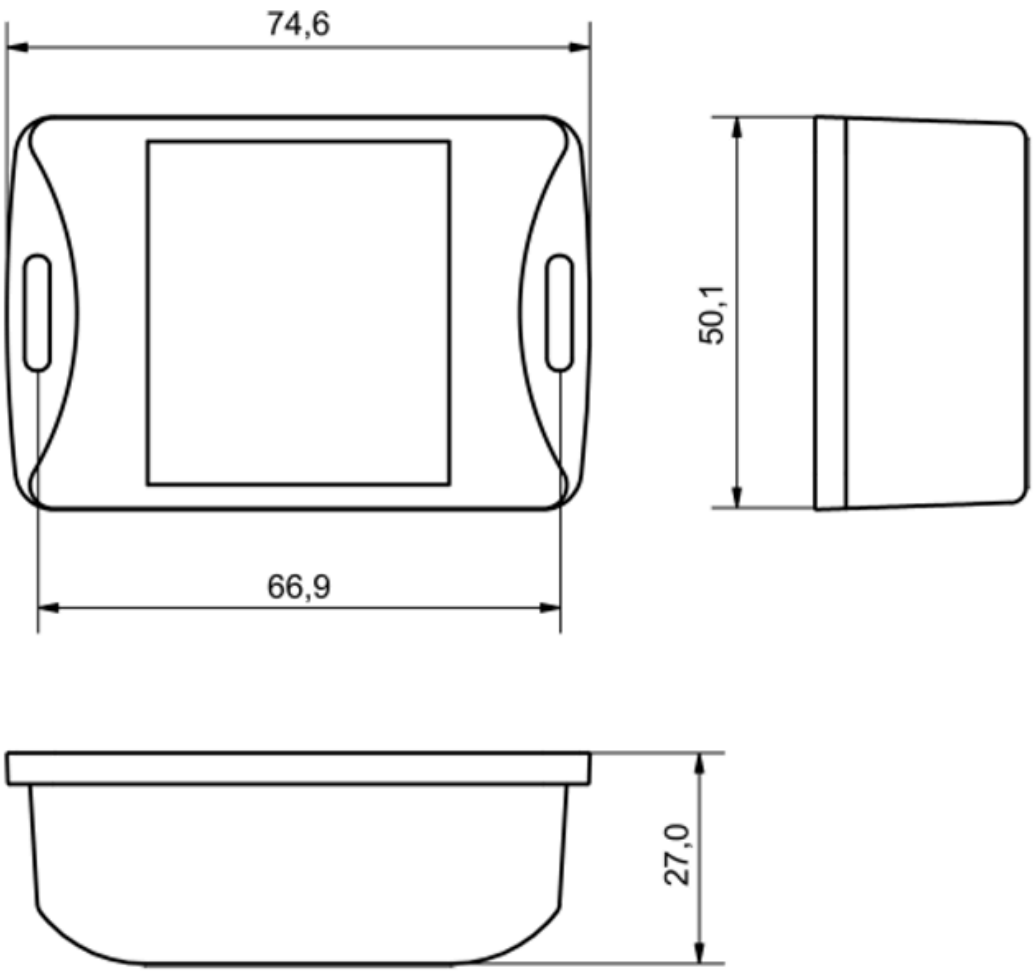
Device construction

Technical characteristics

Parameter	Description
Power supply	**10-24V DC** with a 3,5mm pluggable terminal block **PoE:** 33-57V PoE IEEE 802.3af
Power consumption	1,5W
Input	**Input type:** 1-wire bus **Supported sensors:** temperature / humidity / digital inputs
Output 1	**Output type:** NO (relay) **Maximum relay load:** 1A @ 30V DC **Activation time:** 1ms, **Deactivation time:** 5ms, **Operating mode:** bistable, astable, monostable
Output 2	**Output type:** Open Collector (transistor) NO output (normally open), **Activation time:** <1ms, **Deactivation time:** <1ms, **Operating mode:** bistable, astable, monostable
Communication	Ethernet 10Mbps Half Duplex, RJ45 port
Enclosure ingress protection	IP30

Dimensions



Information

All dimensions are in millimeters.

General view



General characteristics

Communication with the module is done via LAN.

The following methods are available for readout of measured values:

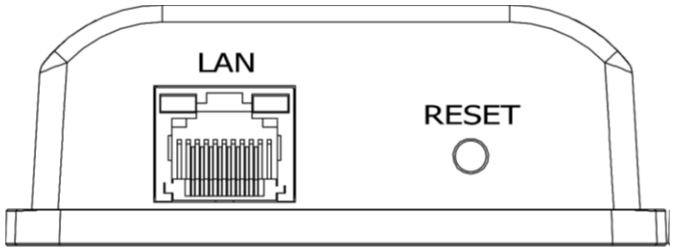
- Built-in WWW server, available from a standard web browser (MOZILLA FIREFOX, OPERA, CHROME are the preferred browsers),
- windows/linux command line,
- HTTP protocol,
- MQTT protocol,
- SNMP protocol,
- Syslog,
- Modbus TCP.

The module is equipped with an LED display, on which measured values can be shown.

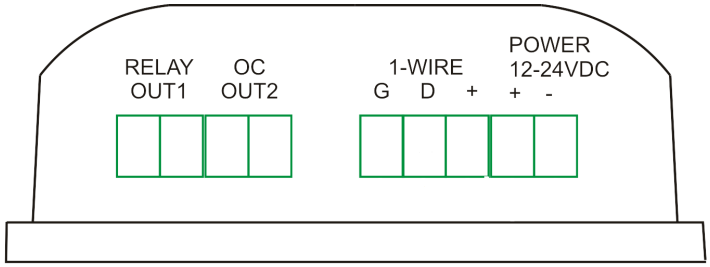
Module connectors description

The Hero Web Sensor module has the following connectors:

- **LAN** – LAN and PoE IEEE 802.3af,
- **RESET** – button used to enable DHCP, check the current IP address and restore the module to factory settings.

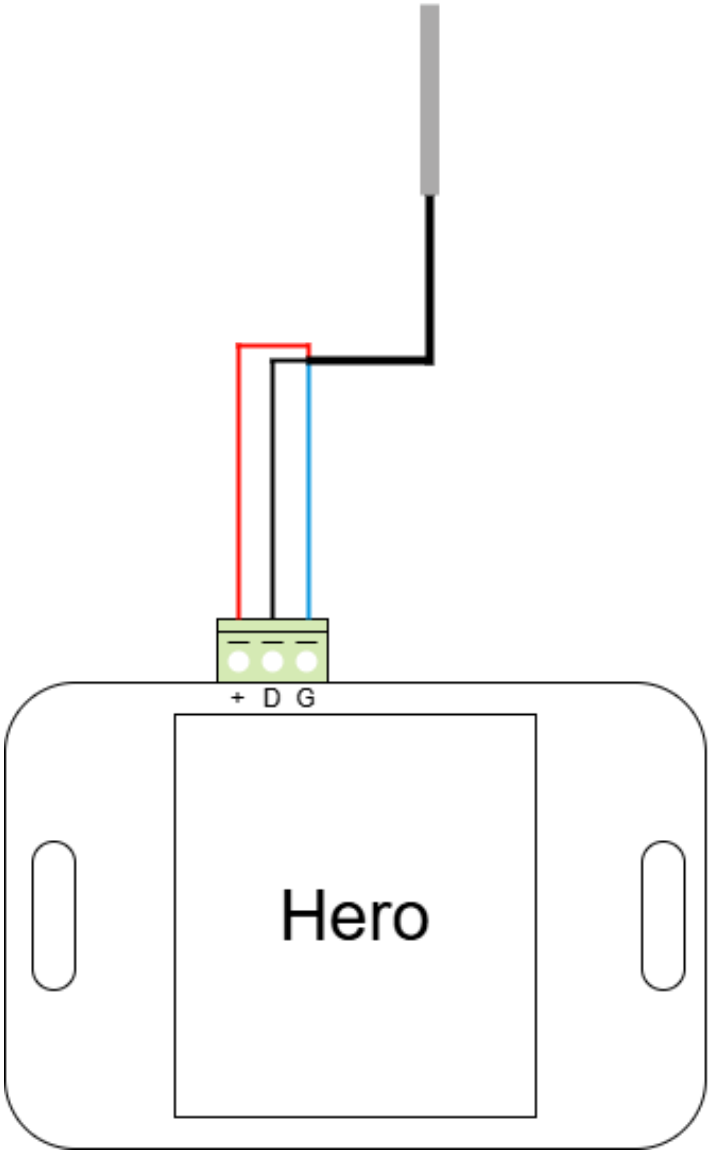


- **RELAY OUT1** – Relay's pluggable terminal block,
- **OC OUT2** – Transistor output's pluggable terminal block,
- **POWER** – Additional power connector when PoE is unavailable. Power supply voltage: 12-24V DC.



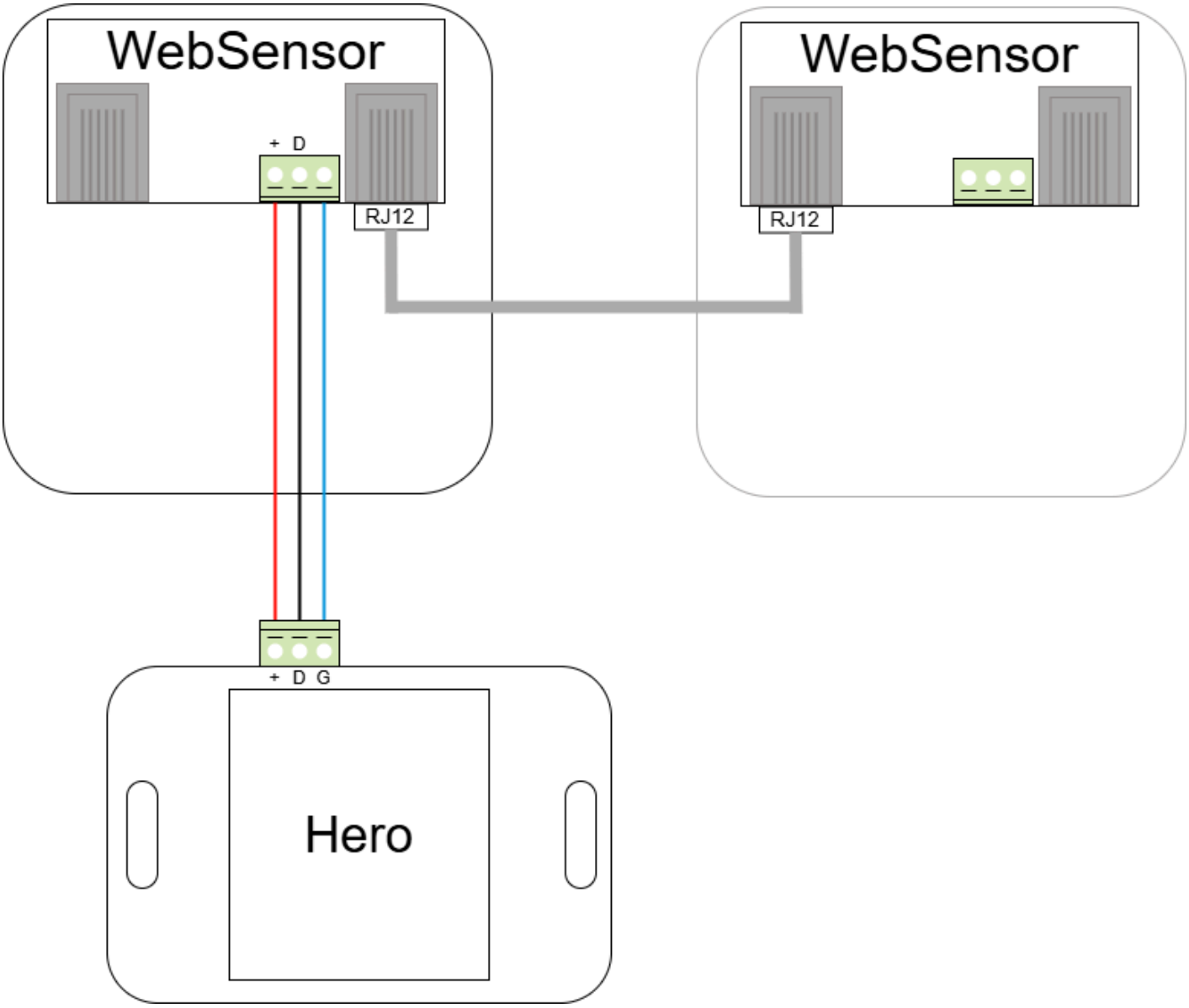
Sensor connection diagram

Connecting a DS18b20 temperature sensor:

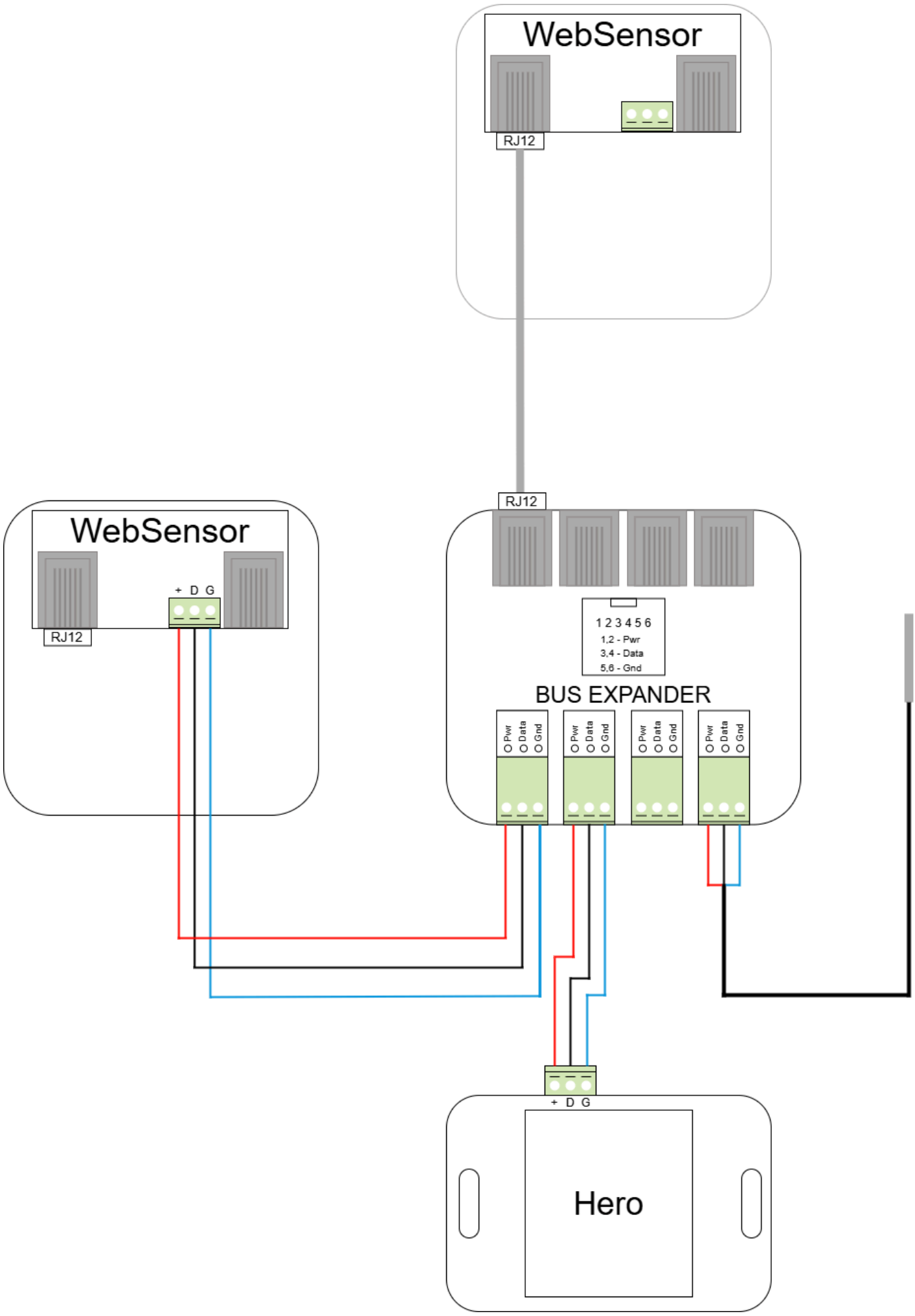


Connecting the WebSensor to the Hero Web Sensor:

Additional WebSensors can be connected in a sequential manner, making system expansion possible by daisy-chaining them:



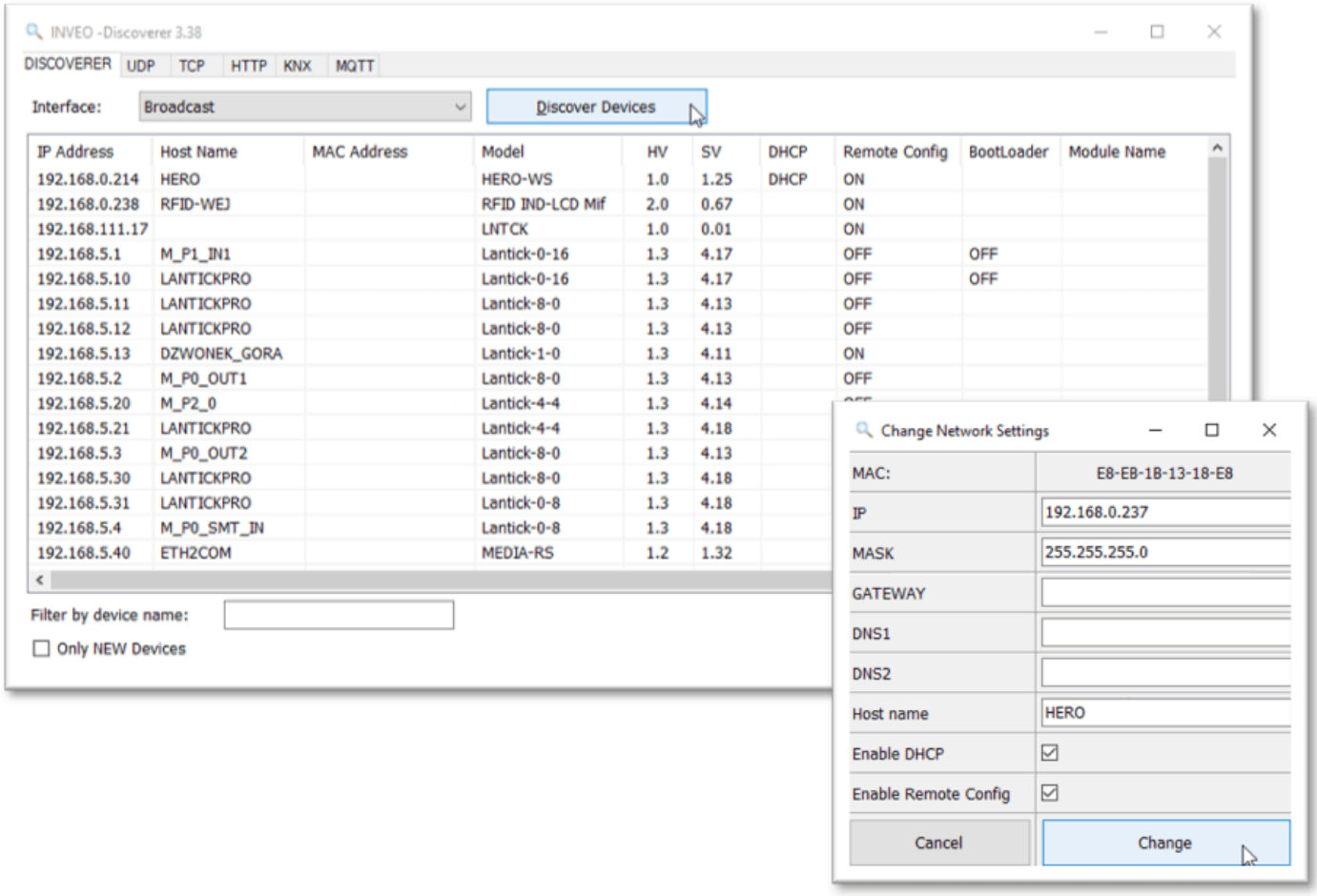
Connecting sensors to the Hero Web Sensor using the BUS EXPANDER splitter:


WebSensor
RJ12
WebSensor
+ D G
RJ12
RJ12
1 2 3 4 5 6
1,2 - Pwr
3,4 - Data
5,6 - Gnd
BUS EXPANDER
Pwr
Data
Gnd
+ D G
Hero

Network configuration

> **Warning**
>
> **After the initial power-up, it's needed to configure the device. It can be done in two ways, the simplest method is to use the Inveo Discoverer programme.**

Changing the device's IP address - Discoverer programme



After running the **Discoverer** programme and searching for the appropriate device:

1. Right-click the device,
2. Click the **Change** button.

After the dialogue window is opened you can:

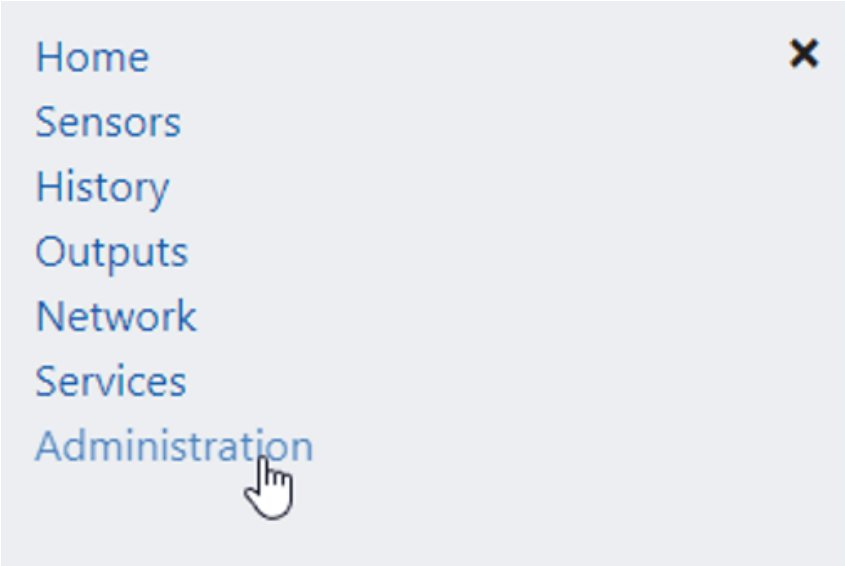
- Set the IP address, mask, gateway, DNS1/DNS2,
- Change the Host name.

> **Note**
>
> **The device will be configured after the Change button is pressed.**

If **Remote Config** is disabled (enabled by default), the device needs to be configured by changing the computer's subnet:

To enable remote configuration:

1. Go to the **Administration** → **Services** tab,
2. Select **Enable Remote Network Config**.



Settings

Name	Value	Description
Enable User Password	☐	
Enable Admin Password	☐	
Unit	Celsius	Select temperature unit.
Add 1-Wire bus delay	☐	Useful for long-cable connection.
Enable TFTP Bootloader	☐	Allow remote upgrade firmware by TFTP. For safety reasons, the option should be disabled.
Enable Remote Network Config	☑	

Tip

After making changes, apply them using the Save button

Changing the computer's subnet address for configuration

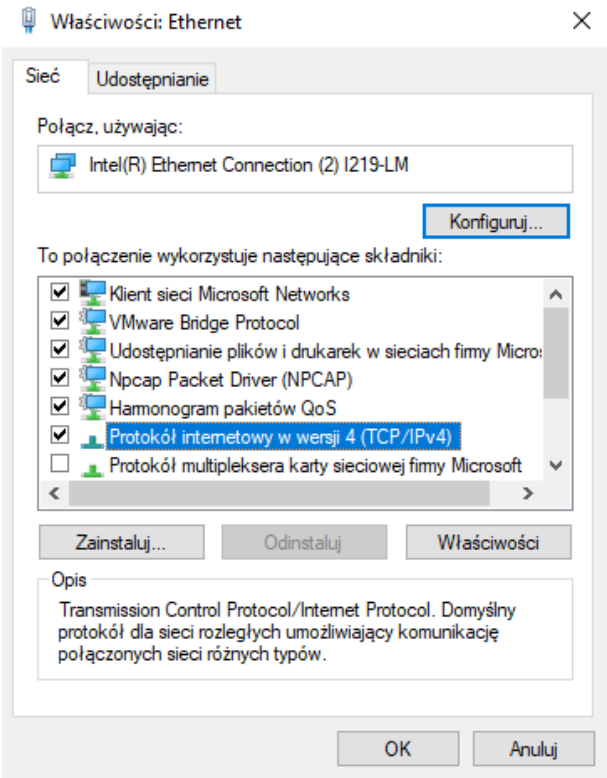
During configuration without **Discoverer** programme, it's needed to change the subnet address of the computer on the same network.

To access the computer's network configuration, do one of the following:

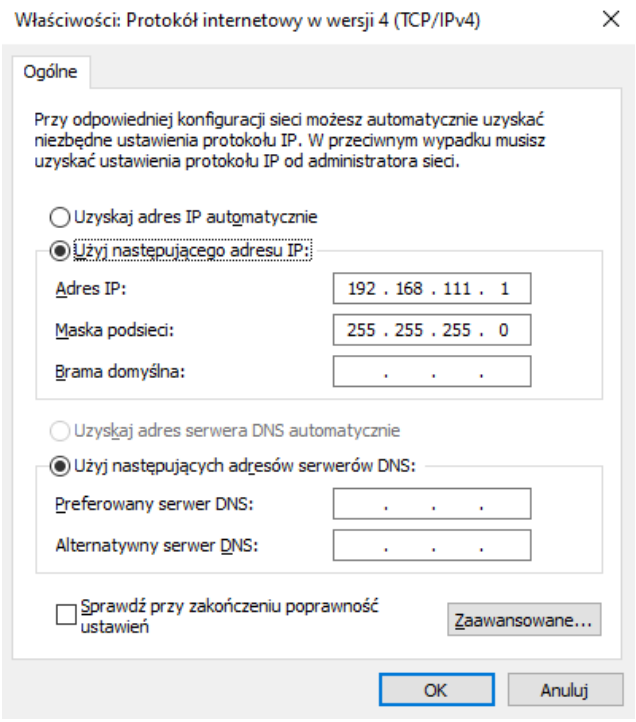
- Press **Win + R**, type in `ncpa.cpl`, and then press **Enter**,
- Alternatively, go to:
  Start → **Control Panel** → **Network and Internet** → **Network and sharing center** → **Change adapter settings**.

Then:

1. Select the network connection,
2. Right-click it and select **Properties**,
3. After selecting this option, network connection configuration screen will appear.



Select **Internet protocol version 4 (TCP/IPv4)** and type in the following parameters:



Note

After applying the configuration with OK, start a web browser and type in the following address: 192.168.111.15. (Default user and password: admin/admin00)

Communication with the module from an external network

Information

If the module is located in a different LAN, port forwarding is required. Depending on the communication method utilized, contact with the network administrator and forwarding of certain ports is needed.

WWW webpage and HTTP protocol

- **TCP 80 port:** Required to access the module's web interface and to communicate via HTTP.

Computer programme or own application:

- **TCP 9761 port:** Used to communicate with the module using dedicated software or own applications.

Modbus TCP

- **TCP 502 port:** Required to communicate with the module using the Modbus TCP protocol.

SNMP protocol

- **Port UDP 161:** Used to communicate with the module using the SNMP protocol.

Checking the IP address

To check the current HERO IP address:

1. Press and hold the RESET button. The screen will display the four groups of an IP address in sequence: eg. 192 168 111 15,
2. After the full address is displayed, release the RESET button.

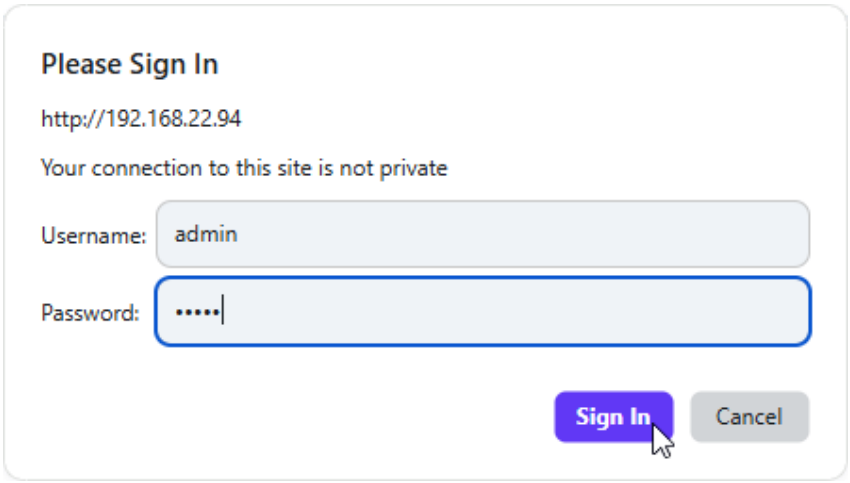
Enabling/Disabling DHCP

To enable or disable DHCP support:

1. Press and hold the reset button until the display shows **dhcP**,
2. Release the RESET button,
3. The current DHCP status will be displayed: **On** (enabled) or **Off** (disabled).

DHCP can also be enabled or disabled in the network settings. Access the **Network** tab or use the **Discoverer** programme.

Device configuration

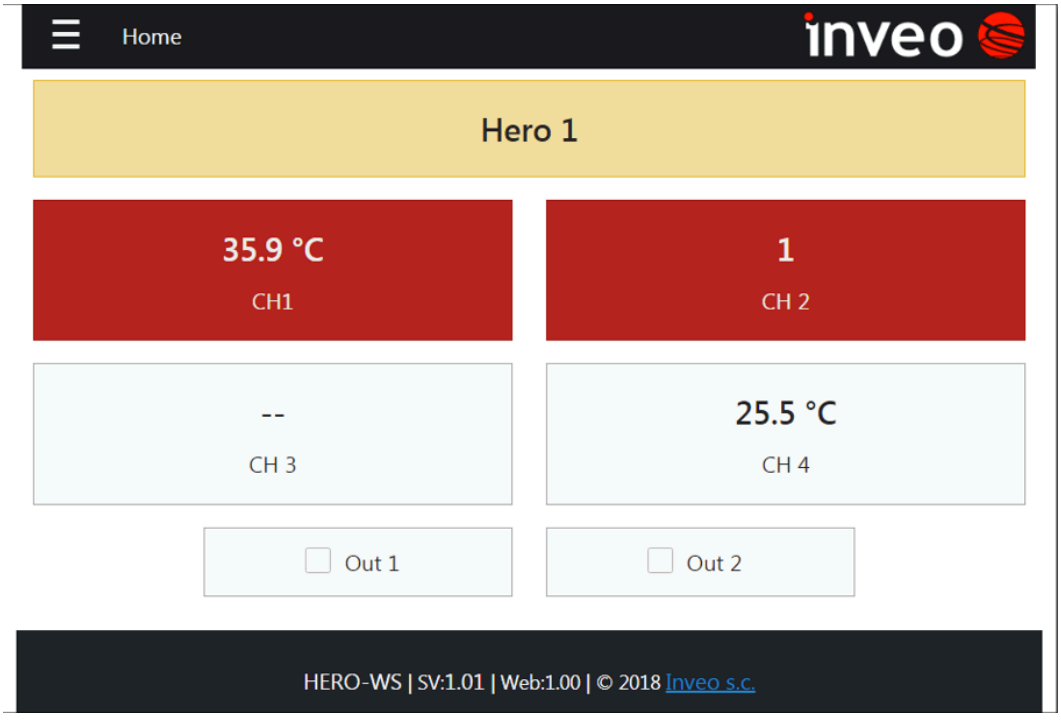


Note

Default login credentials:
Username: `admin`
Password: `admin00`

Module www interface

After a successful login, the user can check the current outputs state and the values measured by the sensors from each channel.
On the main page, alarm and warning states are displayed. The temperature window highlighted with a yellow colour indicates a warning state, while a window highlighted with red indicates an alarm condition.



Sensor names can be changed in **Menu** → **Sensors**, while output names in **Menu** → **Outputs**.
The "Hero 1" name can be changed in **Menu** → **Administration** → **module name**.

> **Information**
>
> **The maximum text length is 15 characters.**

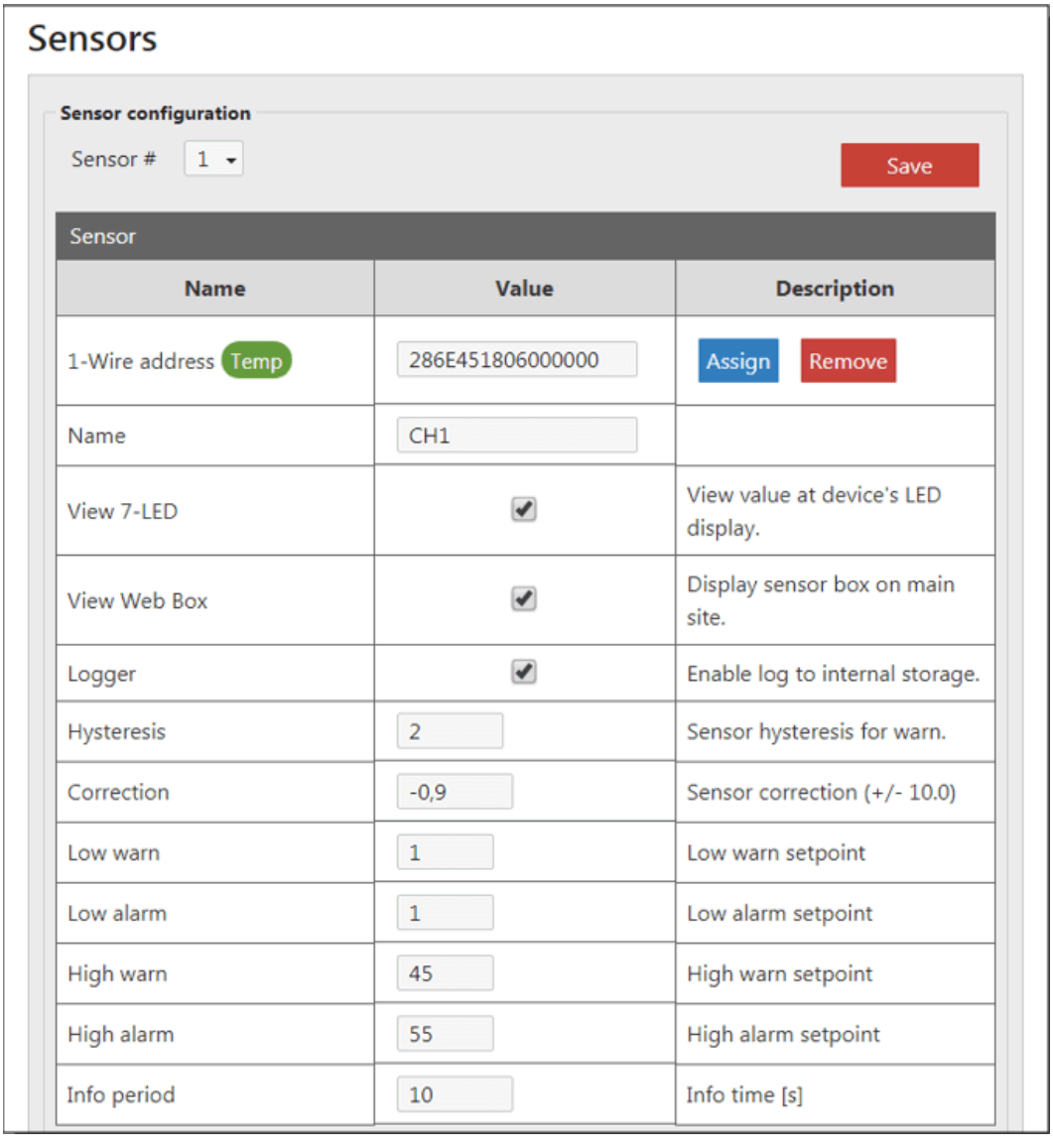
The measured values can be displayed on the LED screen in the following formats:

- Temperature:
  T1 24.3
  t2 -4.3
- Humidity:
  rh1 47.1
  rh3 23.4

- Input state:
  in1 on
  in2 off
- Output state:
  out1 off
  Out2 on

Sensor settings

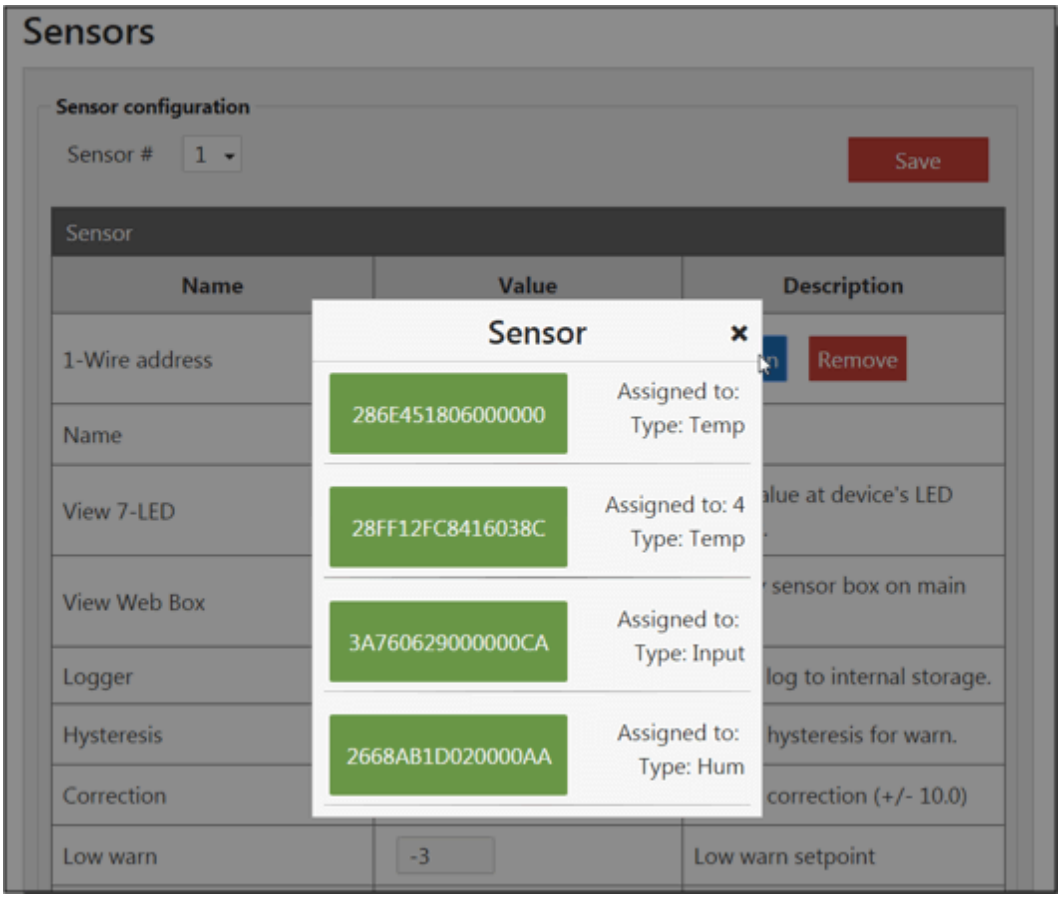
Different measurement devices such as temperature, humidity, and other sensors, can be connected to the "Sensors" input. Configuration options are available for each sensor, allowing the user to customize its operation. To do that, go to **Menu** → **Sensors**.



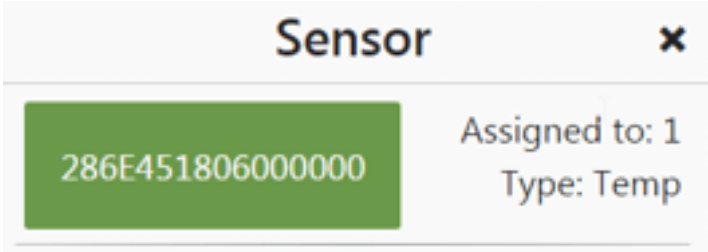
Options available for different sensor types will be described in the **Adding Sensors** section below.

Adding sensors

After the sensors have been connected to the 1-Wire bus correctly, assign the detected sensors to appropriate channels. To do that, click the button to display the detected sensors and assign them to channels, clicking the green field with the sensor's address.

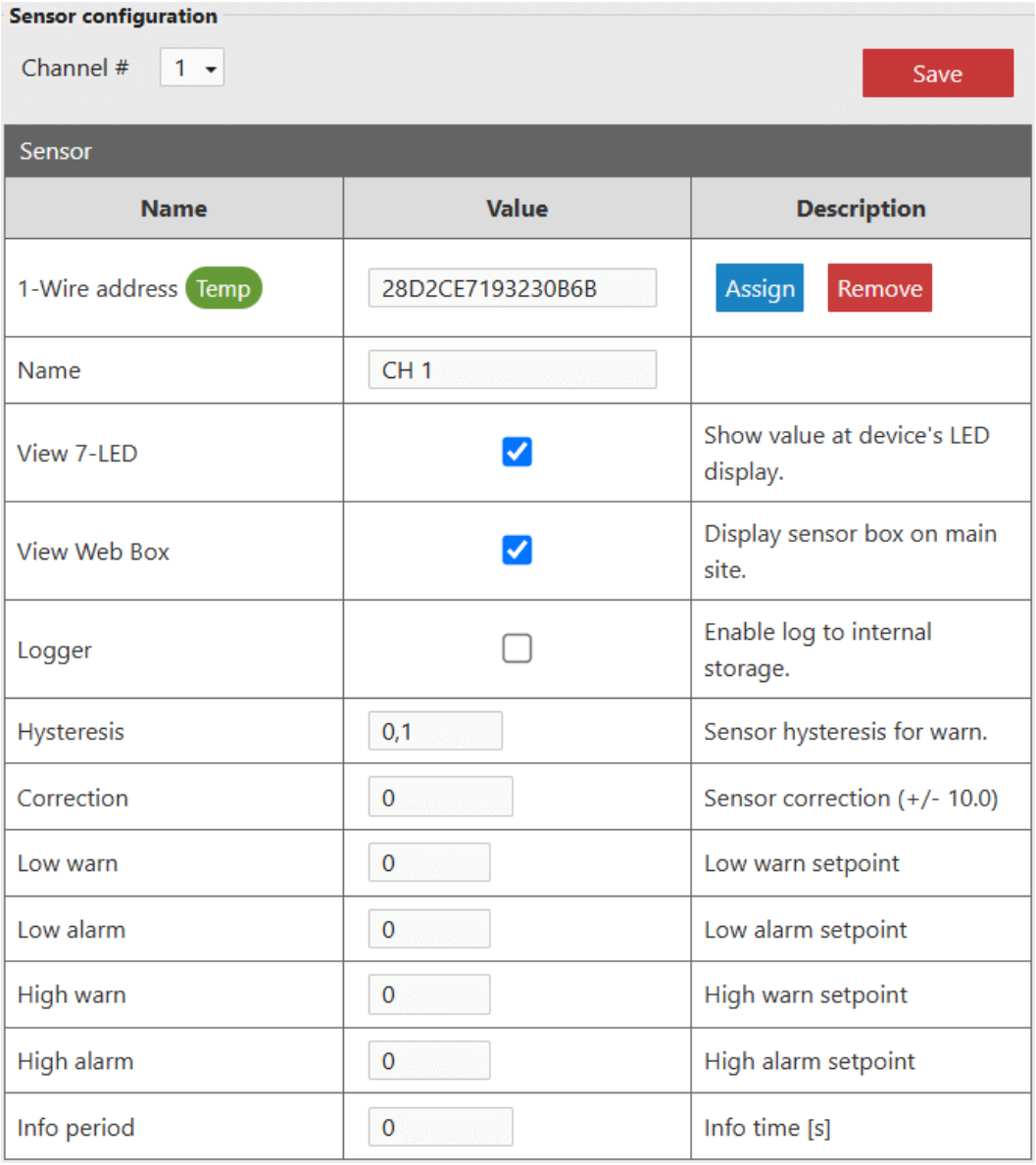


The sensor will be displayed on the screen after it was assigned to the channel. Example: temperature sensor assigned to channel 1:



Temperature sensor – Temp

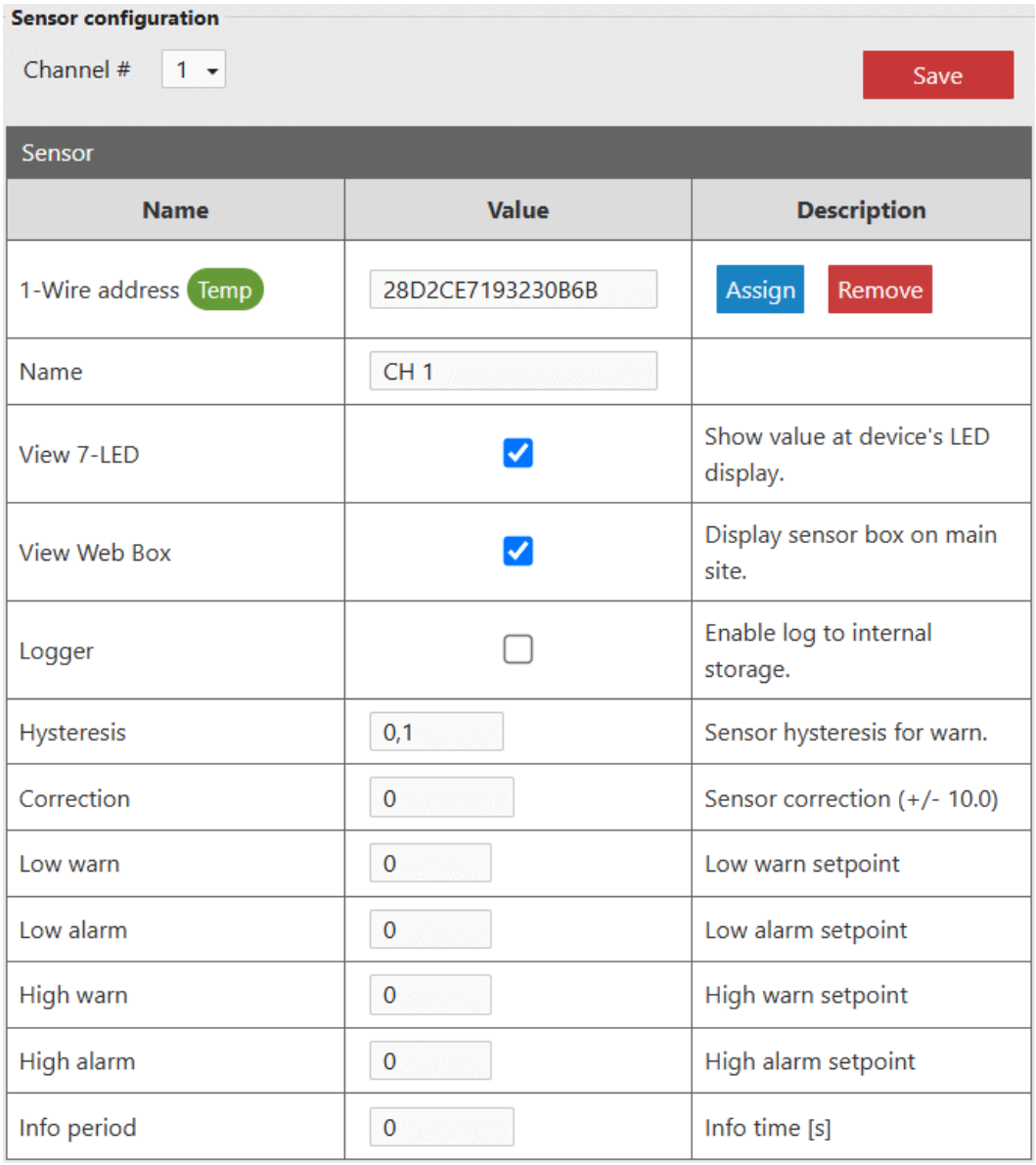
The following options are available for temperature sensors:



- **Channel #** – Channel index, the sensor will be assigned to. Assumes values 1 - 4,
- **1-Wire address (Temp)** – 1-Wire address of the sensor. It can be entered manually or selected from a list of automatically detected sensors by clicking **Assign**,
- **Name** – Name of the sensor that will be displayed on the device's home page (max. 15 characters),
- **View 7-LED** – Display the temperature reading on the device's 7 segment LED display,
- **View Web Box** – Display the sensor readings on the device's home page,
- **Logger** – Enable data logging to device memory,
- **Hysteresis** – Hysteresis value for warnings and alarms. Setting a correct value will prevent the device from sending multiple warning/alarm notifications because of small temperature fluctuations,
- **Correction** – Measured value correction,
- **Low warn, Low alarm, High warn, High alarm** – Configuration of low/high warning/alarm thresholds,
- **Info period** – The time in seconds that the device will send the current temperature reading using the selected communication protocols. Setting the value to 0 will result in sending only the defined warnings/alarms.

Humidity sensor – Hum

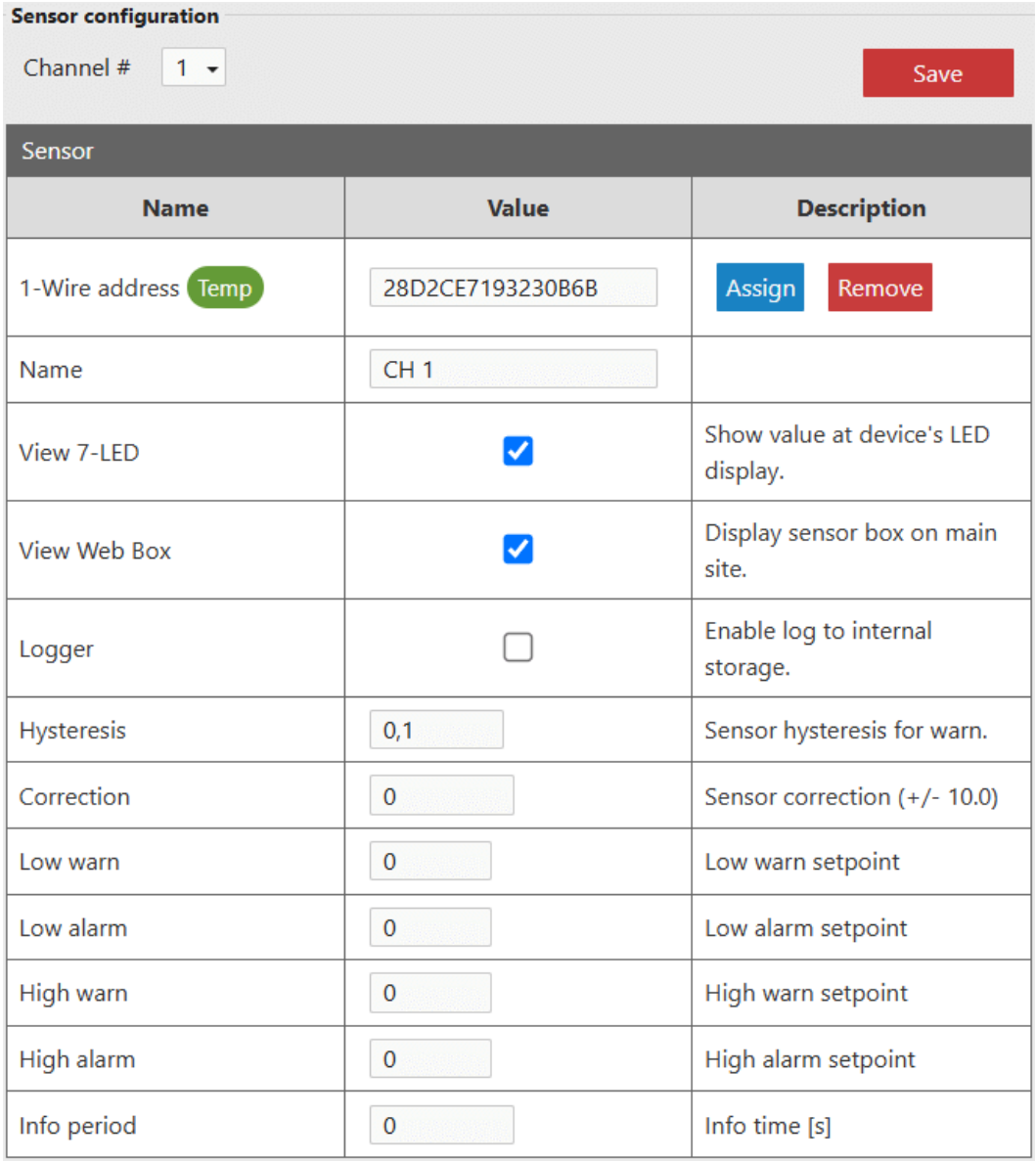
The following options are available for humidity sensors:



- **Channel #** – Channel index, the sensor will be assigned to. Assumes values 1 - 4,
- **1-Wire address (Hum)** – 1-Wire address of the sensor. It can be entered manually or selected from a list of automatically detected sensors by clicking **Assign**,
- **Name** – Name of the sensor that will be displayed on the device's home page (max. 15 characters),
- **View 7-LED** – Display the humidity reading on the device's 7 segment LED display,
- **View Web Box** – Display the sensor readings on the device's home page,
- **Logger** – Enable data logging to device memory,
- **Hysteresis** – Hysteresis value for warnings and alarms. Setting a correct value will prevent the device from sending multiple warning/alarm notifications because of small humidity fluctuations,
- **Correction** – Measured value correction,
- **Low warn, Low alarm, High warn, High alarm** – Configuration of low/high warning/alarm thresholds,
- **Info period** – The time in seconds that the device will send the current humidity reading using the selected communication protocols. Setting the value to 0 will result in sending only the defined warnings/alarms.

Reed switch or flooding sensor – Input

The following options are available for reed switches/flooding sensors:

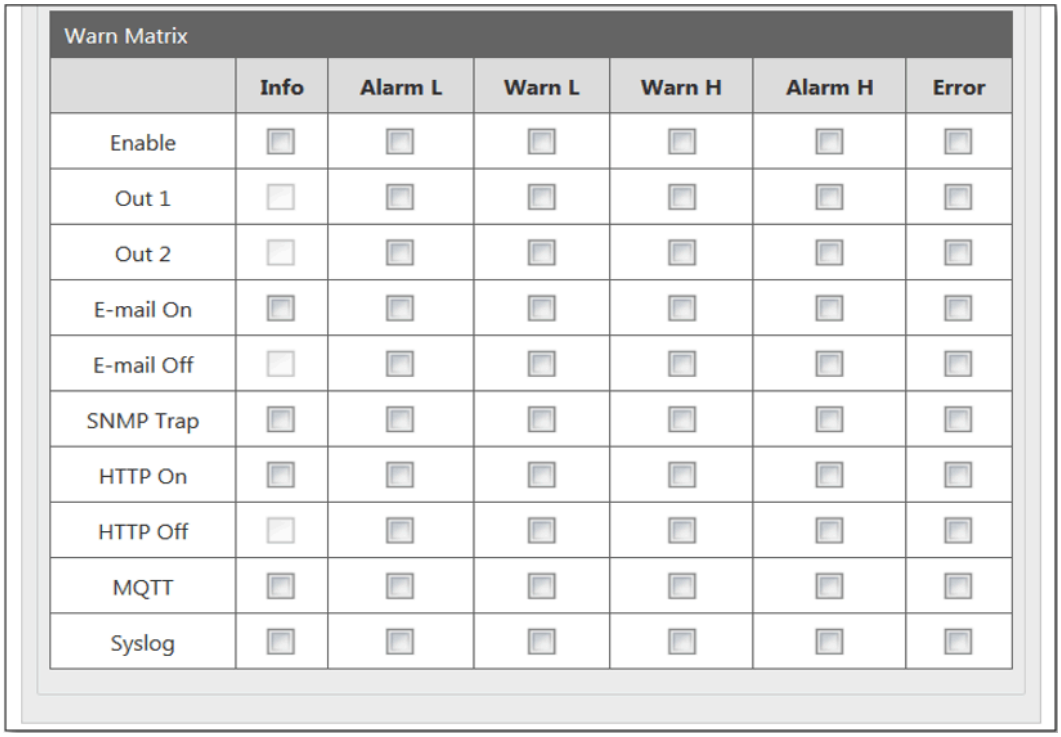


- **Channel #** – Channel index, the sensor will be assigned to. Assumes values 1 - 4,
- **1-Wire address (Input)** – 1-Wire address of the input. It can be entered manually or selected from a list of automatically detected inputs by clicking **Assign**,
- **Name** – Name of the input that will be displayed on the device's home page (max. 15 characters),
- **View 7-LED** – Display the input state on the device's 7 segment LED display,
- **View Web Box** – Display the input state on the device's home page,
- **Logger** – Enable data logging to device memory,
- **Channel select** – Selection of the WebSensor Combo's input channel:
  - **0** – **Leakage** input – flooding sensor,
  - **1** – **Contact** input – reed switch.
- **Active state** – State of the input that will be treated as "active". **0** – sensor "open", **1** – sensor shorted.

- **Info period** – The time in seconds that the device will send the current flooding sensor or reed switch state using the selected communication protocols. Setting the value to 0 will result in sending only the defined warnings/alarms.

Reaction to events

The Hero module can react to exceeded measured values, sensor errors or send information at specified intervals.



The following events are available:

- **Info** – Send informational messages at specified intervals,
- **Alarm L** – Send messages when the lower alarm threshold is exceeded,
- **Warn L** – Send messages when the lower warning threshold is exceeded,
- **Warn H** – Send messages when the upper warning threshold is exceeded,
- **Alarm H** – Send messages when the upper alarm threshold is exceeded,
- **Error** – Send messages when the sensor is damaged or communication errors occur.

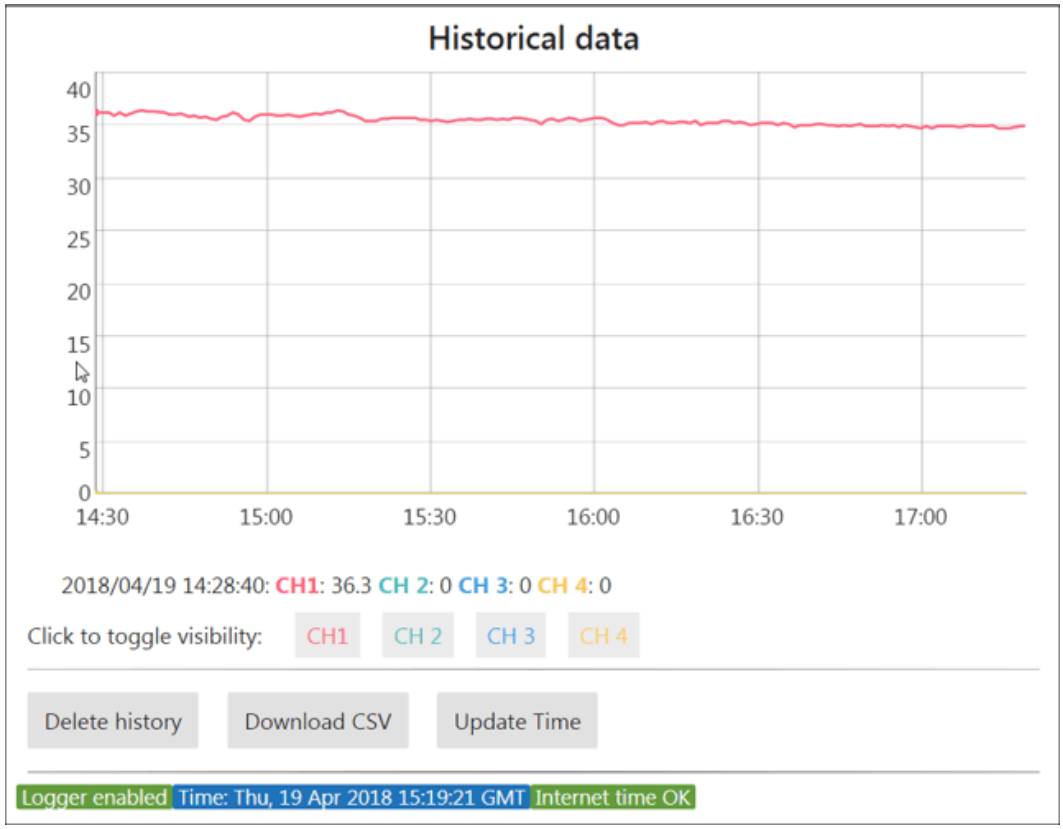
Reaction of the module to events:

- **Enable** – Enable/disable event response (eg. Info, Error, Alarm L). When the "Enable" option is disabled, the module does not monitor the thresholds and display warnings on the main page,
- **Out 1** – Enable/disable output 1,
- **Out 2** – Enable/disable output 2,
- **email On** – Send e-mail messages after an event occurs,
- **email Off** – Send e-mail messages after returning to normal state,
- **SNMP Trap** – Send Trap messages via SNMP protocol after an event occurs and after recovery,
- **HTTP On** – Send TCP frames via HTTP in response to an event,
- **HTTP Off** – Send TCP frames via HTTP after returning to normal state,

- **MQTT** – Reaction for an event occurrence and recovery via MQTT protocol,
- **Syslog** – Reaction for an event occurrence and recovery. Details can be found in the **Services** menu, **SYSLOG** tab.

Data logging

The Hero Web Sensor module enables storing the data read from input channel sensors to the internal memory. The saved data can be viewed in the form of a graph or downloaded as a CSV file. To do that, go to **Menu** → **History**.



CSV file format:

- **timestamp** – Unix timestamp, the number of seconds since 1970-01-01 00:00:00,
- **sensor1..sensor4** – Data from particular input channels.

The data from the module is available at log.csv, eg. http://192.168.111.15/log.csv

timestamp	sensor1	sensor2	sensor3	sensor4
1524140920	36.3	0.0	0.0	0.0
1524141010	36.3	0.0	0.0	0.0
1524141070	36.3	0.0	0.0	0.0
1524141131	36.0	0.0	0.0	0.0

Information

Assuming the logging occurs every minute, the device can store data from last 41 days, which is around 60 thousand events. After the memory is filled, oldest records will be overwritten automatically.

Tip

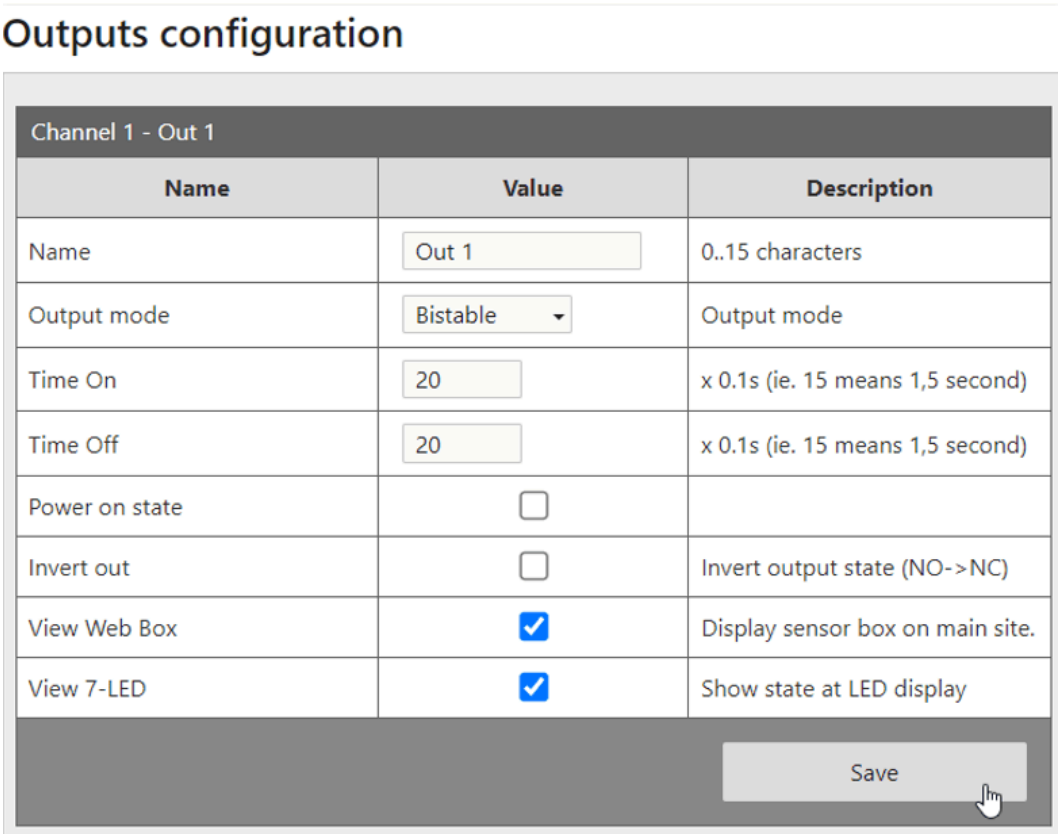
The Hero Web Sensor does not have a built-in Real Time Clock. To record time values correctly, the device needs to download the current time from the Internet using SNTP.

Output parameters

The Hero Web Sensor module is equipped with two input channels:

- **OUT1** – Relay channel,
- **OUT2** – OC (transistor) channel.

In the **Menu** → **Outputs** tab, each output channel can be configured in different modes:

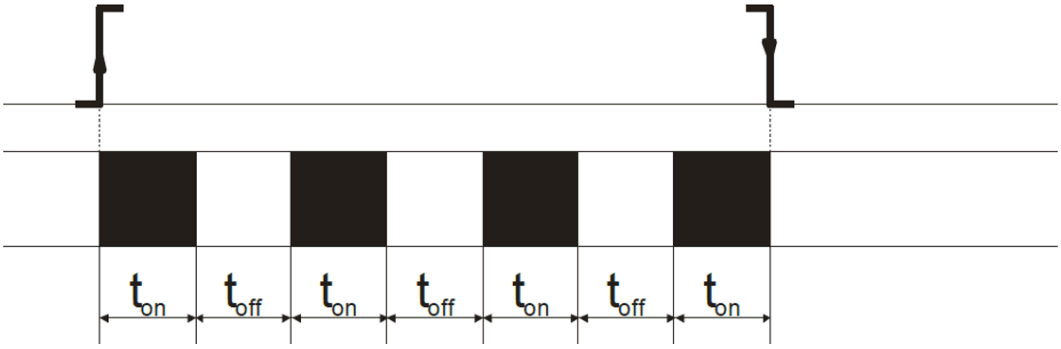


- **Name** – Channel name (maximum length of 15 characters),
- **Output mode** – Output operation mode:
  - Bistable,
  - Astable,
  - TimeBase.
- **Time On** – Activation time,
- **Time Off** – Deactivation time,
- **Power on state** – State of the channel after connecting the power supply,
- **Invert out** – Software output state inversion from NO (normally open) to NC (normally closed),
- **View Web Box** – Display the channel state on the module's main page,
- **View 7-LED** – Option to display the current readouts on the LED screen.

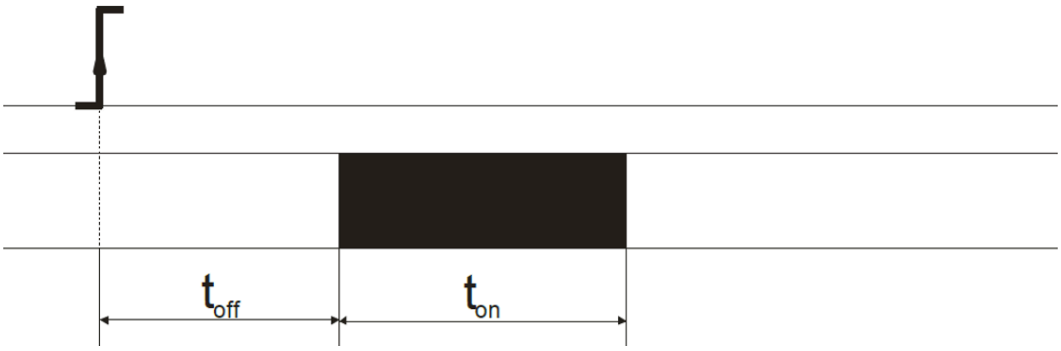
Relay output configuration

The hero module's relay output can operate in three modes:

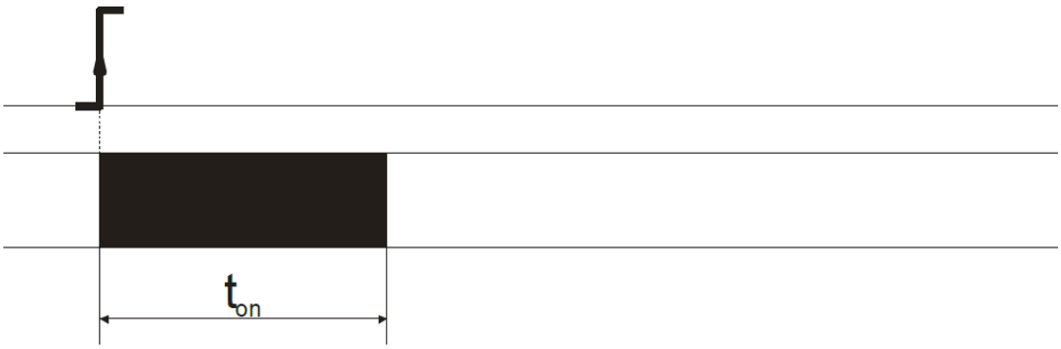
- **Bistable mode** – The relay operates in bistable mode, meaning it has a stable position - it stays activated or deactivated until the state changes,
- **Astable mode** – In the astable (intermittent) mode, the relay is activated and deactivated periodically. The activation and deactivation times are defined by the following parameters:
  - **Time On** – Amount of time the relay is activated,
  - **Time Off** – Amount of time the relay is deactivated.



- **TimeBased mode** – In single trigger mode, the relay operates according to the defined times:
  - If **ton > 0** and **toff > 0**, the relay will activate after **toff** time and remain active for **ton**, after which it deactivates.



- If **ton > 0** and **toff = 0**, the relay will activate for **ton** after triggering and then deactivate.



- If **ton = 0** and **toff > 0**, the relay will activate after triggering and **toff**.



Network settings

Configuration is conducted on the **Menu** → **Network** site.

IP Configuration

Name	Value	Description
MAC Address	00:00:00:00:00:00	MAC Address
Host Name	HERO	NetBIOS name
DHCP	☑	Enable DHCP Client
IP Address	192.168.22.94	A.B.C.D
IP Mask	255.255.255.0	A.B.C.D
Gateway	192.168.22.1	A.B.C.D
DNS1	192.168.0.101	A.B.C.D
DNS2	0.0.0.0	A.B.C.D

Save

Information

Default user and password: admin / admin00

The following fields are used for configuring the module's network interface:

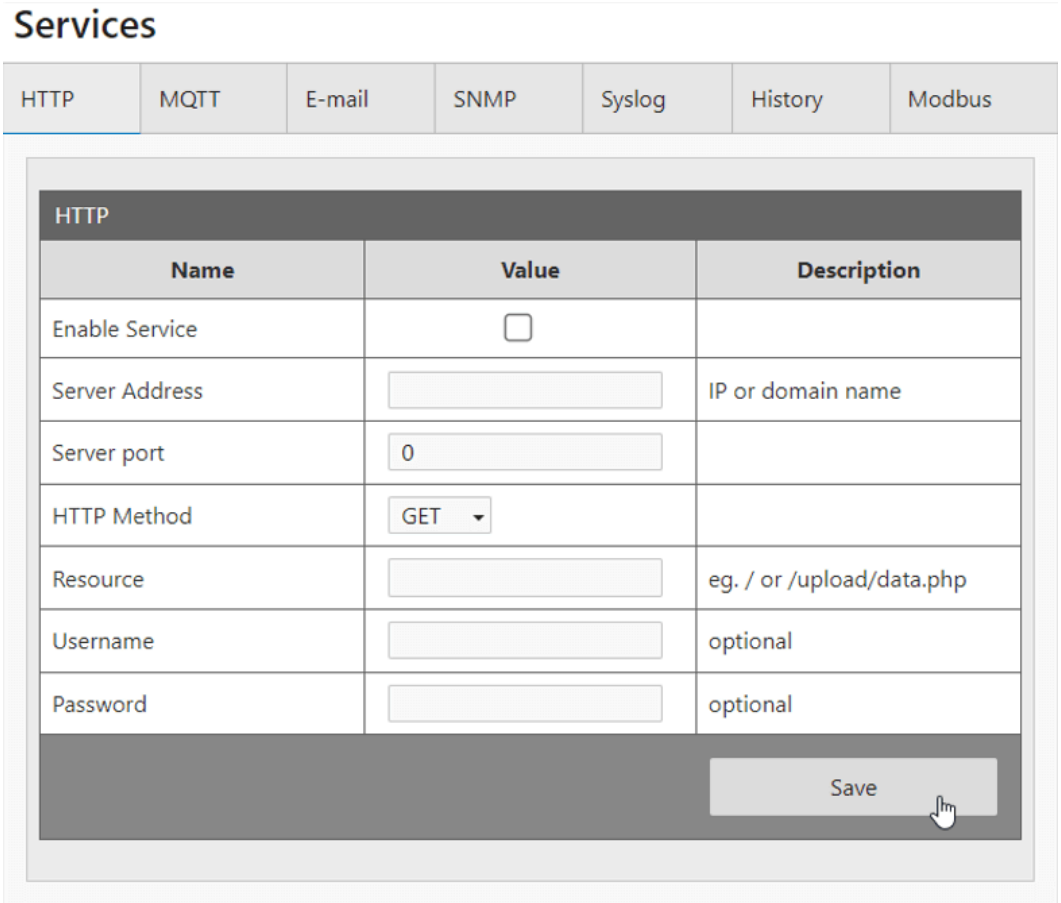
- **MAC Address** – Module MAC address,
- **Host Name** – NETBIOS name,
- **DHCP** – Selecting this option forces the use of DHCP assigned IP address,
- **IP Address** – Module IP address (the module will be visible in the network under this address),
- **IP Mask** – IP subnet mask,
- **Gateway** – Network gateway,
- **DNS1, DNS2** – DNS server addresses.

> **Tip**
>
> **After making changes, apply them using the Save button**

Services settings

HTTP protocol communication

The HERO module allows for transfer of event information via HTTP, using the GET or POST methods. Visible below is the description of settings and sample HTTP requests:



- **Enable Service** – Service activation,
- **Server Address** – HTTP server address, to which the information will be sent,
- **Server Port** – Port number, on which the HTTP server is listening,
- **HTTP Method** – Message sending method (GET / POST),
- **Resource** – Resource, to which the module will send data to,
- **Username** – User name, if required,
- **Password** – Password, if required.

Sample HTTP requests:

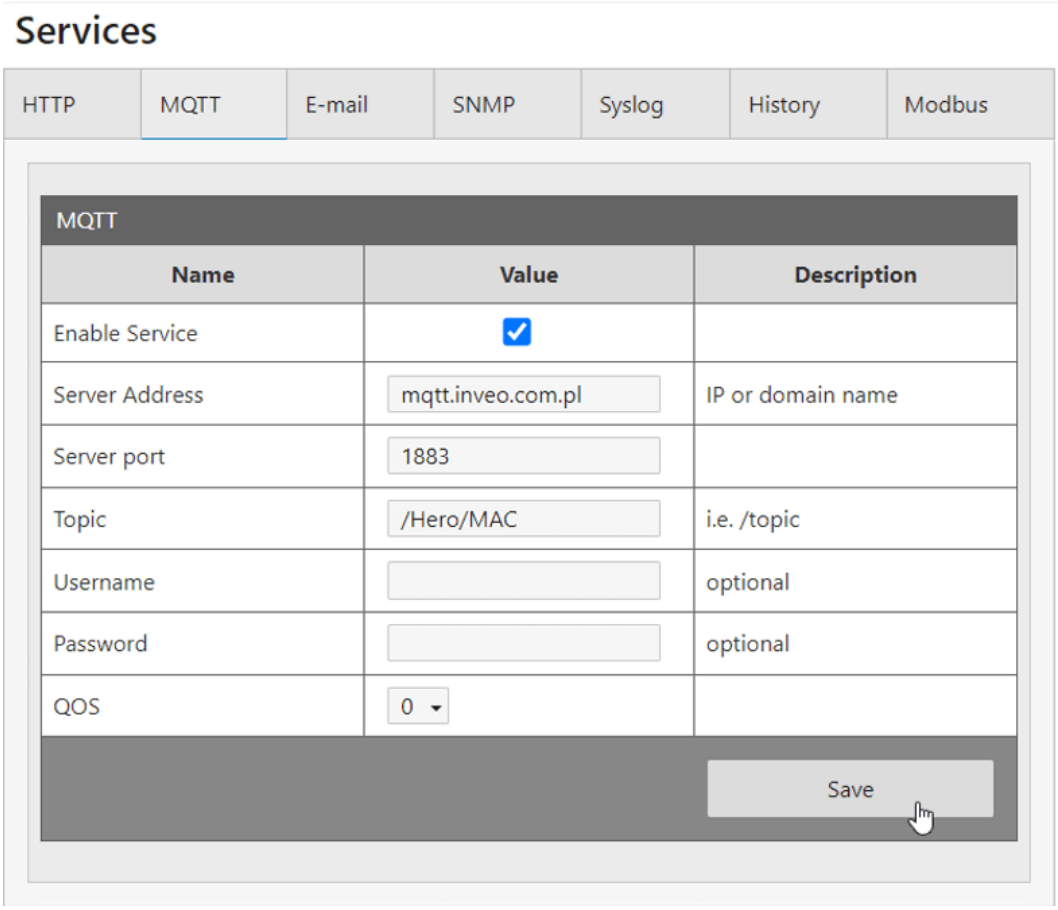
HTTP request	Description
`ch=[1..4]`	Channel number the information is coming from
`val=`	Value measured by the sensor
`notify=[0..1]`	Information flag. `notify=1` means that the message is informational
`warnHi=[0..1]`	Warning flag. `warnHi=1` indicates that the upper warning threshold has been exceeded. `warnHi=0` indicates recovery
`warnLo=[0..1]`	Warning flag. `warnLo=1` indicates that the lower warning threshold has been exceeded. `warnLo=0` indicates recovery
`alarmHi=[0..1]`	Alarm flag. `alarmHi=1` indicates that the upper alarm threshold has been exceeded. `alarmHi=0` indicates recovery
`alarmLo=[0..1]`	Alarm flag. `alarmLo=1` indicates that the lower alarm threshold has been exceeded. `alarmLo=0` indicates recovery
`error=[0..1]`	Error flag. `error=1` indicates sensor damage or absence. `error=0` indicates the normal condition

Example HTTP requests

- `/test.php?ch=2&val=26.4&notify=1` – Example of a request that sends the value of 26.4 from channel 2 as an information,
- `/test.php?ch=2&val=1.4&alarmHi=1` – Example of a request that sends the value of 1.4 from channel 2 and indicates exceeding of the upper alarm threshold.

MQTT protocol communication

The HERO module supports the MQTT protocol, allowing data to be sent to the server every minute and when the value changes. The data is transferred with no encryption. After connection with the broker is established, the users can subscribe to the device data. There is no limit to the amount of users that can receive data from a single device.



- **Enable Service** – Enable the MQTT service,
- **Server Address** – MQTT server address (maximum of 24 characters),
- **Server port** – Port, on which the MQTT server is listening (usually 1883),
- **Topic** – Topic, to which the messages will be sent (must be formatted, eg. /sensor/home - without / at the end),
- **Username** – Optional MQTT user name,
- **Password** – Optional MQTT user password,
- **QOS** – Quality of Service level.

Tip

After making changes, apply them using the Save button

Tip

For the Inveo broker, the settings should be as follows:
- MQTT Address**: mqtt.inveo.com.pl**
- MQTT Port**: 1883**
A computer with the Inveo Monitoring **application installed can be used as a broker. To do that, type the PC's IP address into the** MQTT Address **field.**

Tip

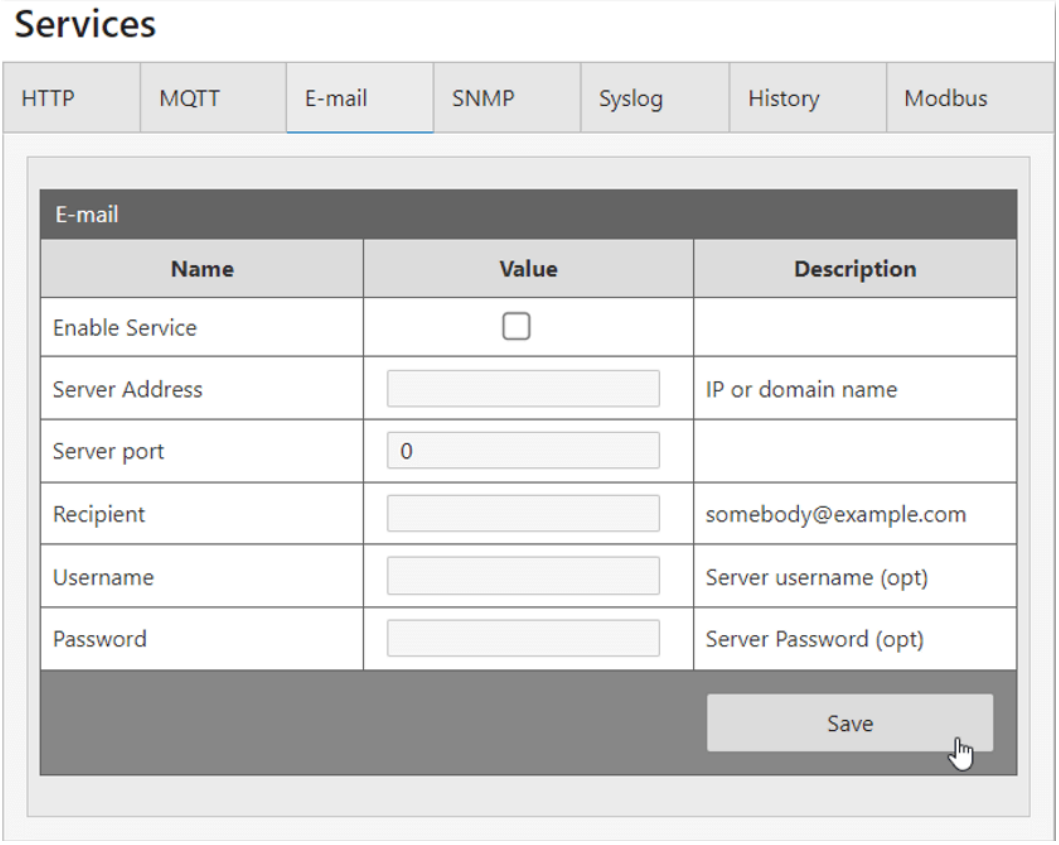
Make sure that the selected Topic is unique, eg. /Hero/MAC_address.

Next, go to the **Sensors** tab, select a sensor, and define the information to be sent utilizing the MQTT protocol in the **Warn Matrix** / **MQTT** row.

Warn Matrix						
	Info	**Alarm L**	**Warn L**	**Warn H**	**Alarm H**	**Error**
Enable	☑	☐	☐	☐	☐	☐
Out 1	☐	☐	☐	☐	☐	☐
Out 2	☐	☐	☐	☐	☐	☐
E-mail On	☐	☐	☐	☐	☐	☐
E-mail Off	☐	☐	☐	☐	☐	☐
SNMP Trap	☐	☐	☐	☐	☐	☐
HTTP On	☐	☐	☐	☐	☐	☐
HTTP Off	☐	☐	☐	☐	☐	☐
MQTT	☑	☐	☐	☐	☐	☐
Syslog	☐	☐	☐	☐	☐	☐

E-mail communication using the SMTP protocol

To allow the Hero Web Sensor to send e-mails containing measured values or warnings, activate the e-mail service in the **Services** menu first. The module sends notifications based on the **Warn Matrix** settings in the **Sensors** tab. The frequency of message sending can be defined using **Info Period**. To configure the e-mail service, go to **Services / E-mail** and input the following parameters:



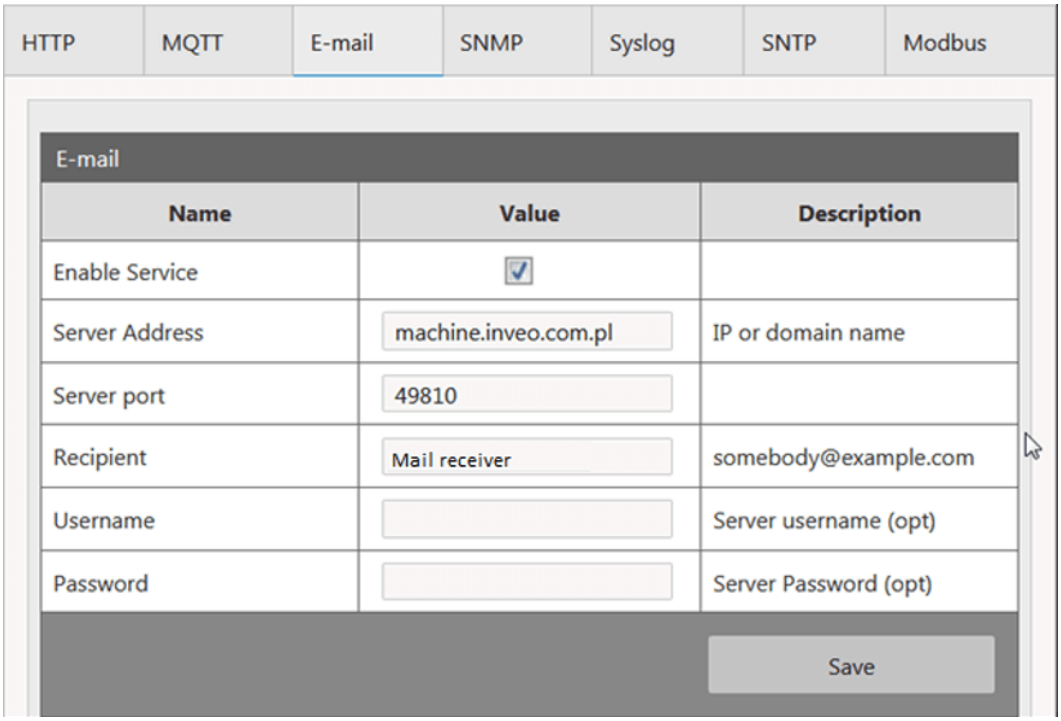
- **Enable Service** – Enable the e-mail service,
- **Server Address** – E-mail server address, inputted as an IP address or a domain (maximum of 24 characters),
- **Server port** – Port, on which the e-mail server is listening,
- **Recipient** – Recipient e-mail address,
- **Username**,
- **Password**.

E-mail encryption:

Information

Hero does not support the SSL protocol or data encryption. In order to send messages to mailboxes that require encryption, it is needed to configure the proxy server that will encrypt the received data and forward it to the desired recipient.
Encrypted SMTP usually uses ports 587 and 465

The Inveo server can be used, as shown below:

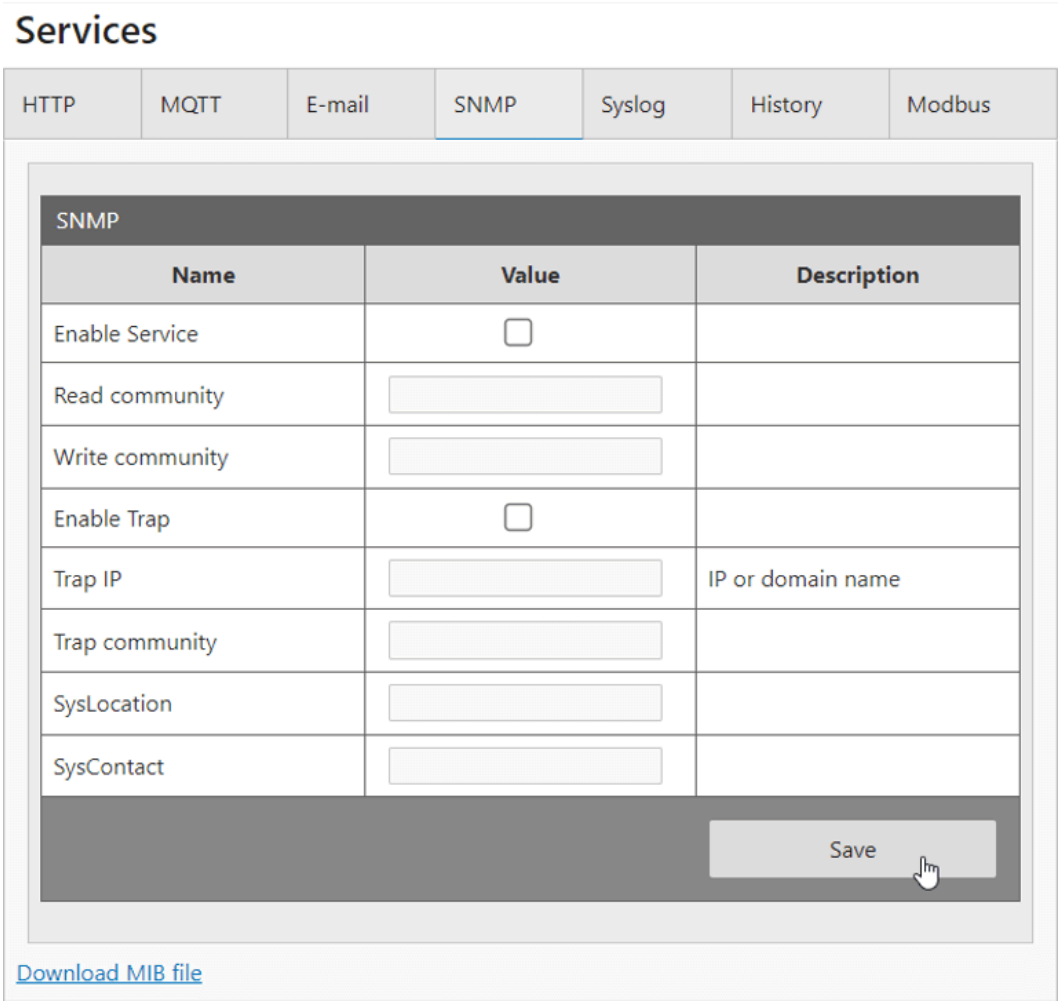


Example e-mail looks like this:

- **Sender:** do_not_reply@inveo.com.pl
- **Topic:** Hero 1 – Notify – sensor1:21,7
- **Content:** Hero 1 sensor1:21,7

SNMP protocol communication

The Hero Web Sensor supports SNMP v2c, allowing for remote sensor data readout. To configure the SNMP service, go to **Services / SNMP** and input the following settings:



- **Enable Service** – Enable the SNMP service,
- **Read community** – Password allowing data to be read,
- **Write community** – Password allowing data to be written,
- **Enable Trap** – Enable the SNMP TRAP service,
- **Trap IP** – IP address to which trap requests will be sent.

The MIB file allowing for easy integration with network management systems can be downloaded using the **Download MIB file** link.

Reading data from the module

Basic parameters that can be read from the Hero Web Sensor module are shown below:

Name	Format	OID
Channel 1 temperature	STRING	.1.3.6.1.4.1.42814.12.5.1.5.0
Channel 2 temperature	STRING	.1.3.6.1.4.1.42814.12.5.1.5.1
Channel 3 temperature	STRING	.1.3.6.1.4.1.42814.12.5.1.5.2
Channel 4 temperature	STRING	.1.3.6.1.4.1.42814.12.5.1.5.3
Channel 1 temperature x10	INTEGER	.1.3.6.1.4.1.42814.12.5.1.6.0
Channel 2 temperature x10	INTEGER	.1.3.6.1.4.1.42814.12.5.1.6.1
Channel 3 temperature x10	INTEGER	.1.3.6.1.4.1.42814.12.5.1.6.2
Channel 4 temperature x10	INTEGER	.1.3.6.1.4.1.42814.12.5.1.6.3
Channel 1 sensor type	INTEGER	.1.3.6.1.4.1.42814.12.5.1.3.0
Channel 2 sensor type	INTEGER	.1.3.6.1.4.1.42814.12.5.1.3.1
Channel 3 sensor type	INTEGER	.1.3.6.1.4.1.42814.12.5.1.3.2
Channel 4 sensor type	INTEGER	.1.3.6.1.4.1.42814.12.5.1.3.3

Sending TRAP requests

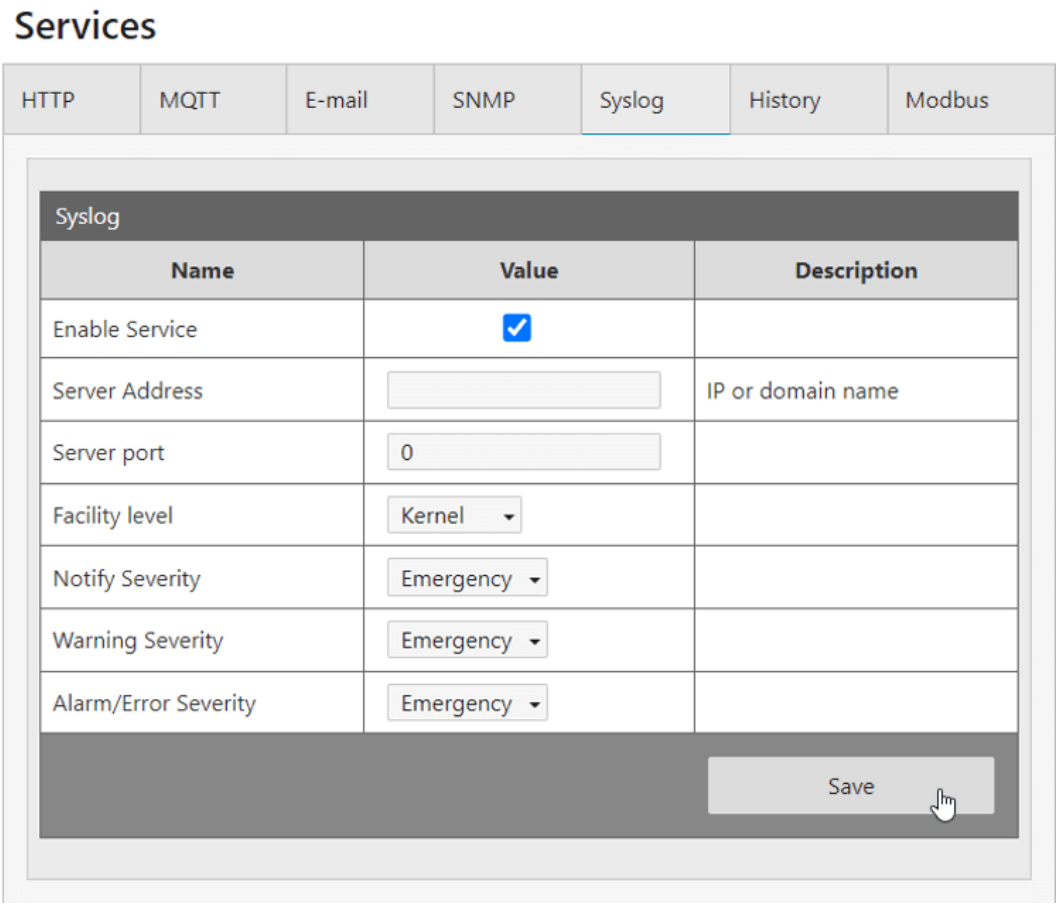
The Hero Module can send TRAP notifications when the input channel state changes, in defined time periods or when an alarm occurs. To configure the destination address, type it into the **Trap IP** field.

Syslog communication

The HERO module can send messages to the Syslog server, allowing for event and device status monitoring. The messages can be sent periodically (Info) or when events such as exceeding temperature/humidity thresholds or sensor failure occur.

Syslog configuration

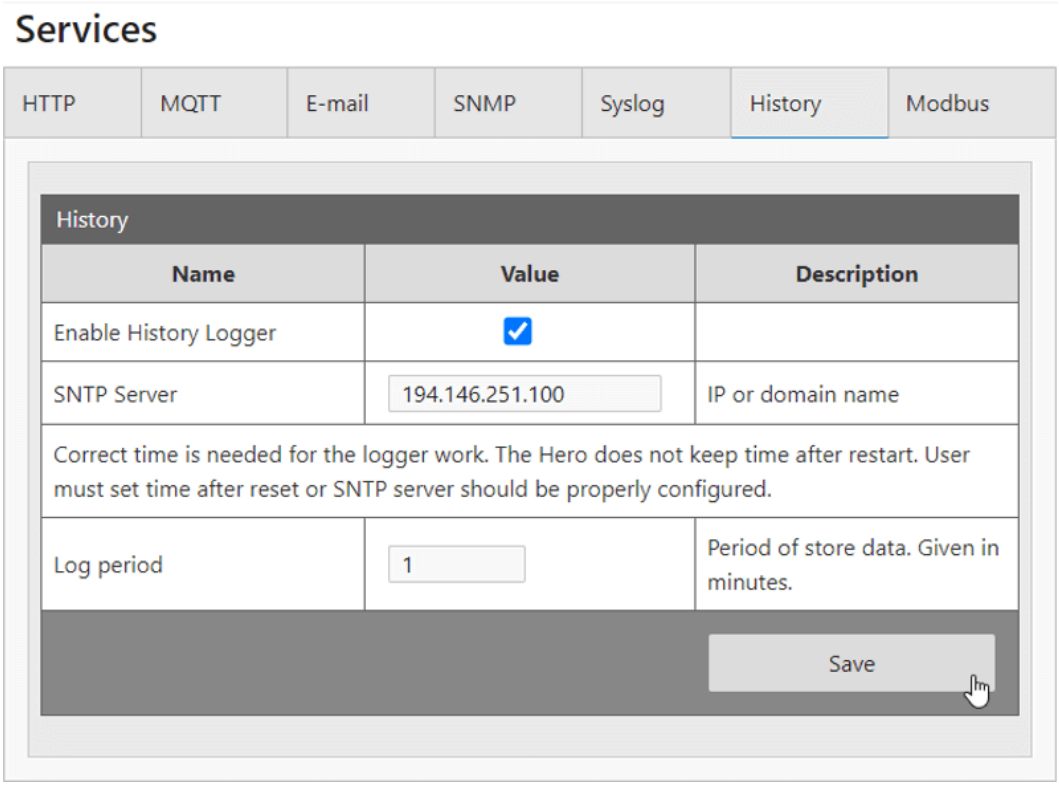
To configure communication with the Syslog server, the following parameters should be set in the **Services / Syslog** tab:



- **Enable Service** – Enable the Syslog service,
- **Server Address** – Syslog server address in the form of an IP address or a domain (maximum of 24 characters),
- **Server port** – Port, on which the Syslog server is listening,
- **Facility level** – Source of the information. Available options are: Kernel, User, Mail, Daemon, Auth, Syslog, LPR, News, UUCP, Cron, Sectry, FTP, NTP, LGAUDT, LGALRT, Clock, Local 0...Local 7, etc,
- **Notify Severity** – Severity of sent events when the Info option is selected in the event matrix,
- **Warning Severity** – Severity of sent events when the Warn L or Warn H options are selected in the event matrix,
- **Alarm/Error Severity** – Severity of sent events when the Alarm L, Alarm H or Error options are selected in the event matrix.

History tab

Hero Web Sensor does not have a built-in Real Time Clock, that's why current time is downloaded from the Internet using the SNTP protocol. The time is used for logging data in the device's internal memory. Time synchronization occurs every 10 minutes. The device uses GMT time only with no option to change the time zone.



SNTP configuration

To configure the time synchronization service, set:

- **Enable Service** – Enable the SNTP service,
- **Server Address** – SNTP server addres from which the time will be downloaded.

Example SNTP servers:

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

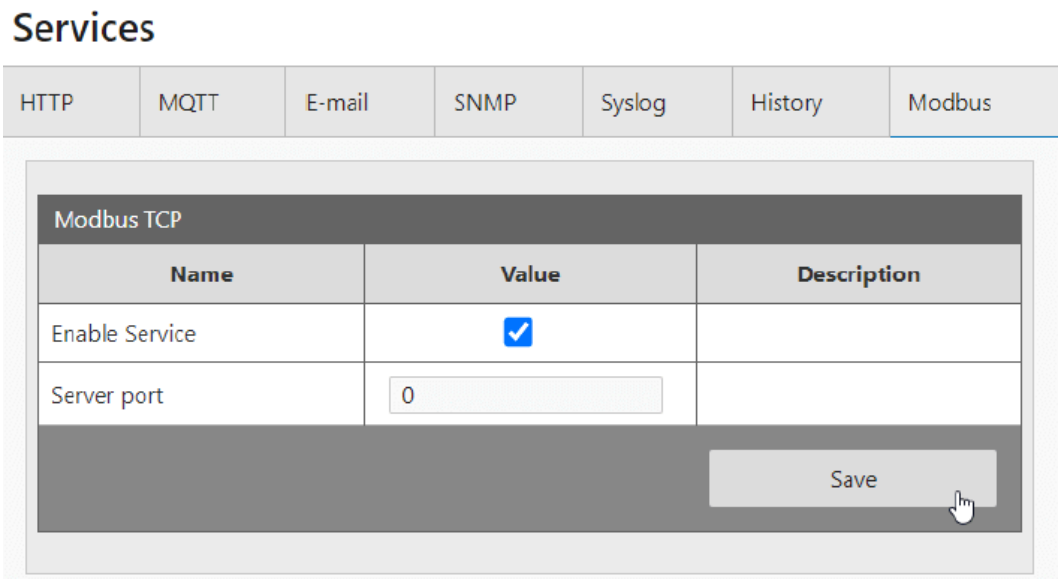
Modbus communication

The HERO module allows data readout and writing using Modbus TCP. The following Modbus functions are supported:

- 0x01 Read Coils
- 0x03 Read Holding Register
- 0x05 Write Single Coil
- 0x06 Write Single Register
- 0x0F Write Multiple Coils
- 0x10 Write Multiple Registers

Modbus TCP configuration

To configure the Modbus TCP communication, set:



- **Enable Service** – Enable the Modbus TCP service,
- **Server Port** – Port, on which the Modbus TCP client is listening.

Holding Registers addressing

The HERO module supports different registers that can be read or written. The list of available registers with their descriptions is shown below.

Address	Name	R/W	Description
1000	Channel1 x 10	R	Value read from channel 1, multiplied by x10 (temperature/humidity) or 1/0 (digital input)
1001	Channel1 Integer Fraction	R	
1002	Channel1 Decimal Fraction	R	
1003	Channel2 x 10	R	Value read from channel 2, multiplied by x10 (temperature/humidity) or 1/0 (digital input)
1004	Channel2 Integer Fraction	R	
1005	Channel2 Decimal Fraction	R	
1006	Channel3 x 10	R	Value read from channel 3, multiplied by x10 (temperature/humidity) or 1/0 (digital input)
1007	Channel3 Integer Fraction	R	
1008	Channel3 Decimal Fraction	R	
1009	Channel4 x 10	R	Value read from channel 4, multiplied by x10 (temperature/humidity) or 1/0 (digital input)
1010	Channel4 Integer Fraction	R	
1011	Channel4 Decimal Fraction	R	

Coils addressing

Address	Name	R/W	Description
1000	Channel1 Sensor Failure	R	
1001	Channel1 Warning Low	R	Channel 1 lower warning threshold exceeded
1002	Channel1 Alarm Low	R	Channel 1 lower alarm threshold exceeded
1003	Channel1 Warning High	R	Channel 1 upper warning threshold exceeded
1004	Channel1 Alarm High	R	Channel 1 upper alarm threshold exceeded
1005	Channel1 Error	R	
1006	Channel2 Sensor Failure	R	
1007	Channel2 Warning Low	R	Channel 2 lower warning threshold exceeded
1008	Channel2 Alarm Low	R	Channel 2 lower alarm threshold exceeded
1009	Channel2 Warning High	R	Channel 2 upper warning threshold exceeded
1010	Channel2 Alarm High	R	Channel 2 upper alarm threshold exceeded
1011	Channel2 Error	R	
1012	Channel3 Sensor Failure	R	
1013	Channel3 Warning Low	R	Channel 3 lower warning threshold exceeded
1014	Channel3 Alarm Low	R	Channel 3 lower alarm threshold exceeded
1015	Channel3 Warning High	R	Channel 3 upper warning threshold exceeded
1016	Channel3 Alarm High	R	Channel 3 upper alarm threshold exceeded
1017	Channel3 Error	R	
1018	Channel4 Sensor Failure	R	
1019	Channel4 Warning Low	R	Channel 4 lower warning threshold exceeded

1020	Channel4 Alarm Low	R	Channel 4 lower alarm threshold exceeded
1021	Channel4 Warning High	R	Channel 4 upper warning threshold exceeded
1022	Channel4 Alarm High	R	Channel 4 upper alarm threshold exceeded
1023	Channel4 Error	R	
1024	1-Wire Bus Error	R	1-Wire Bus short-circuit
1025	On OUT 1	R/W	Activate/deactivate output 1
1026	Coil OUT 1	R	Output 1 state
1027	On OUT 2	R/W	Activate/deactivate output 2
1028	Coil OUT 2	R	Output 2 state

HTTP resources

The HERO module allows control and data readout using the HTTP GET protocol. Available resources are described below.

Available resources:

- **ow.xml** – 1-Wire bus information,
- **sensor.xml** – Detailed information about channel settings,
- **sensorState.xml** – Information about sensor state,
- **status.xml** – Basic information about the module,
- **stat.php** – Output control resource.

Download of resources in JSON format is available using different extensions:

- ow.json
- sensor.json
- sensorState.json
- status.json

Module state readout

To read the current module state, type the resource address into a web browser. For example:

http://192.168.111.15/status.xml

status.xml

```
<response>
    <prod_name>HERO-WS</prod_name>
    <sv>1.36</sv>
    <mac>D8:80:39:D8:13:FA</mac>
    <out>00000000</out>
    <on>00000000</on>
    <bus>1</bus>
</response>
```

Section	Description
`<prod_name>`	Module type
`<sv>`	Module software version
`<mac>`	Module MAC address. Unique for each device
`<out>`	Relay and OC output states

`<on>`	Relay and OC output states
`<bus>`	1 – bus OK, 0 – bus shorted

`ow.xml`

`ow.xml` resource contains detailed information about the sensors on the bus:

Section	Description
`<address>`	Unique sensor address
`<failure>`	Sensor readout error
`<error>`	Sensor readout error counter
`<val_a>`	RAW data from the sensors
`<val_b>`	RAW data from the sensors
`<val_c>`	RAW data from the sensors
`<finalValA>`	Diagnostic data
`<finalValB>`	Diagnostic data
`<assigned>1`	

`sensor.xml`

`sensor.xml` resource contains detailed information about channel settings:

Section	Description
`<address>`	Unique sensor address
`<name>`	Channel name
`<hysteresis>`	Channel hysteresis [0..10]
`<correction>`	Indication correction [-10..10]
`<fBoxVisible>`	Measurement visibility on the main page

`<fLogger>`	Logging readouts to memory
`<fShowLed>`	Display measurements on the LED screen
`<lowWarn>`	Lower warning threshold
`<lowAlarm>`	Lower alarm threshold
`<highWarn>`	Upper warning threshold
`<highAlarm>`	Upper alarm threshold
`<infoTime>`	Information message interval
`<lowWarnFlags>`	Warning table flags
`<lowAlarmFlags>`	Warning table flags
`<highWarnFlags>`	Warning table flags
`<highAlarmFlags>`	Warning table flags
`<infoFlags>`	Warning table flags
`<errorFlags>`	Warning table flags

`sensorState.xml`

`sensorState.xml` resource displays the current sensor state:

Section	Description
`<present>`	Sensor present on the bus
`<lowWarn>`	1 - lower threshold warning state
`<lowAlarm>`	1 - lower threshold alarm state
`<highWarn>`	1 - upper threshold warning state
`<highAlarm>`	1 - upper threshold alarm state
`<error>`	1 - bus error

`<value>`	Measured value
`<unit>`	Measured value unit

Output control – `stat.php` resource

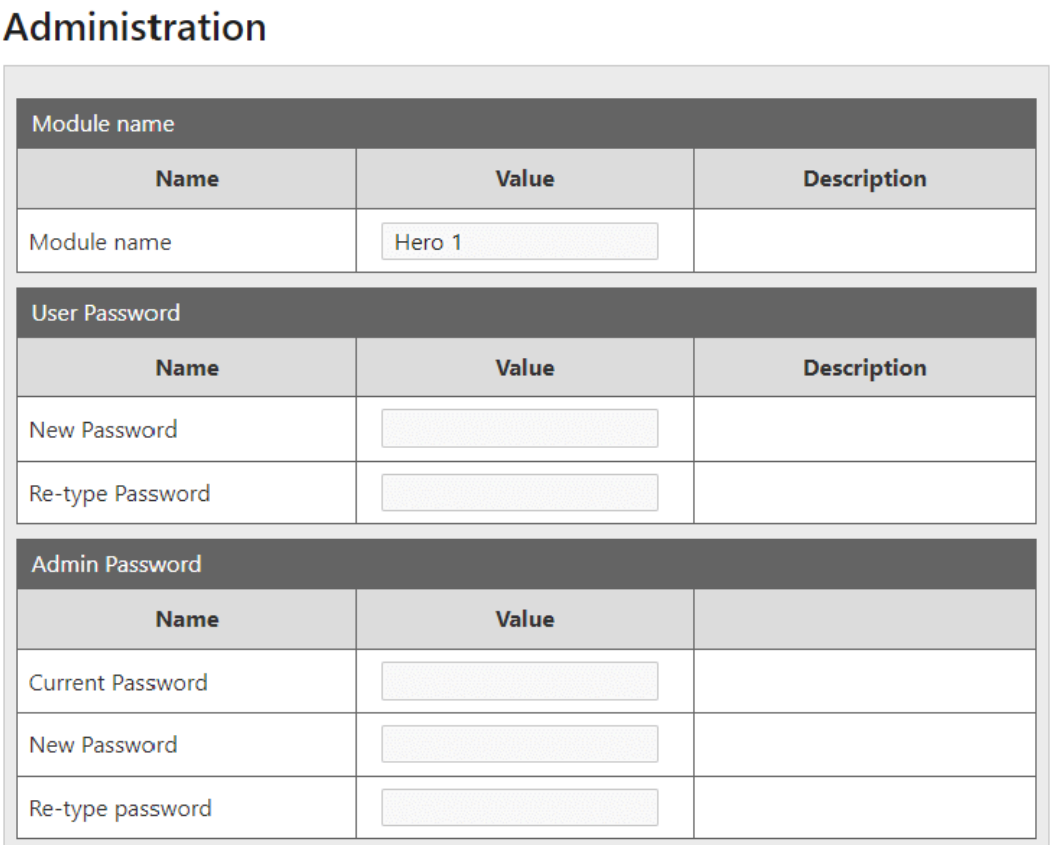
Command	Description
`http://<IP_address>/stat.php?on=x`	Output activation. x = output number, x = [1..2]
`http://<IP_address>/stat.php?off=x`	Output deactivation. x = output number, x = [1..2]
`http://<IP_address>/stat.php?inv=x`	Invert output state. x = output number, x = [1..2]
`http://<IP_address>/stat.php?set=87654321`	Set all outputs. Available options: 1 - activate 0 - deactivate n - invert state - - no state change
`http://<IP_address>/stat.php?on=a&ton=x&toff=y&astab`	Activate output a in astable mode, with tOn = x and tOff = y
`http://<IP_address>/stat.php?on=a&ton=x&toff=y&bistab`	Activate output a in bistable mode, with tOn = x and tOff = y
`http://<IP_address>/stat.php?on=a&ton=x&toff=y&timebased`	Activate output a in time based mode, with tOn = x and tOff = y

HTTP protocol module control examples

1. OUT1 enable:
   `http://192.168.111.15/stat.php?on=1`
2. OUT1 invert state:
   `http://192.168.111.15/stat.php?inv=1`
3. OUT2 disable:
   `http://192.168.111.15/stat.php?off=2`
4. Output 1 enable; output 2 invert.
   `http://192.168.111.15/stat.php?set=000000n1`

Module settings

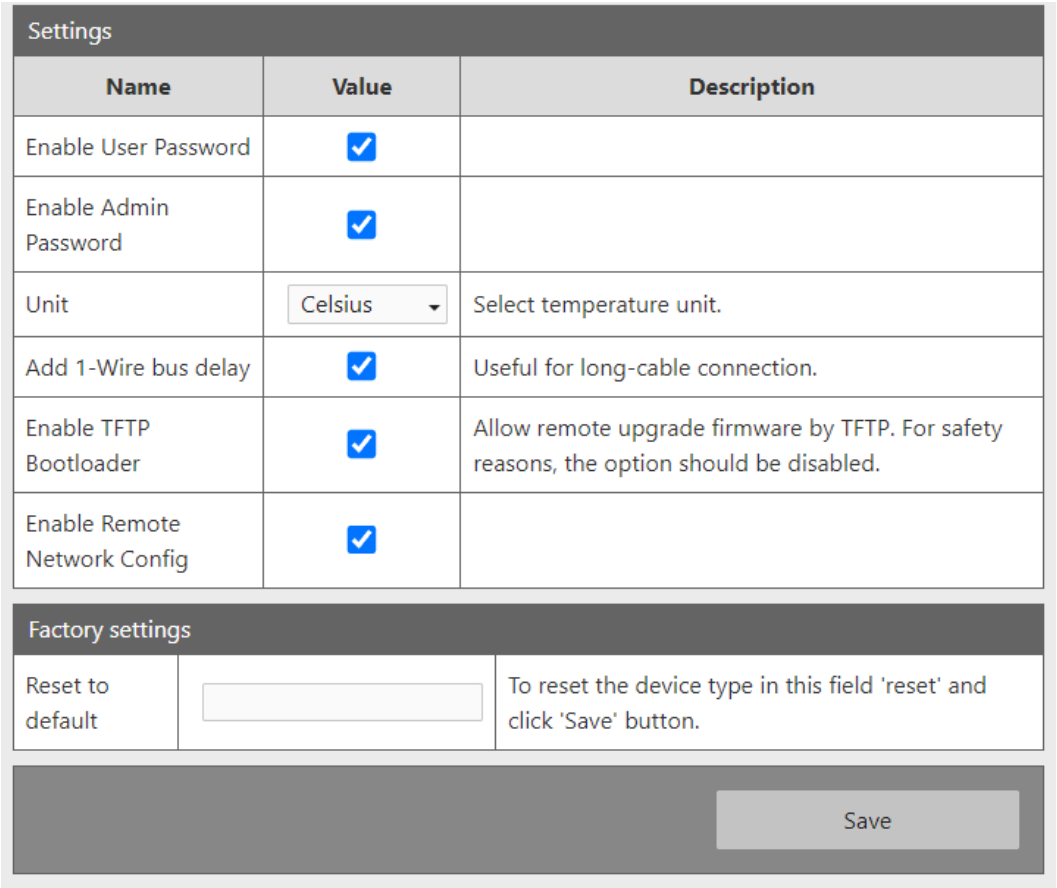
In **Menu** → **Administration**, HERO module settings are located. The following settings are available:



- **Module name** – module name,
- **User Password:**
  - **New Password** – when changing the user password,
  - **Re-type Password** – when changing the user password.
- **Admin Password:**
  - **Current Password** – when changing the administrator password,
  - **New Password** – when changing the administrator password,
  - **Re-type Password** – when changing the administrator password.

Tip

The module name and passwords can contain up to 15 characters.



Settings

- **Enable User Password**,
- **Enable Admin Password**,
- **Unit** – Temperature sensor's measurement units (Celsius or Fahrenheit),
- **Add 1-Wire bus delay**,
- **Enable TFTP Bootloader**,
- **Enable Remote Network Config** – eg. **Discoverer** programme.

Factory settings

- **Reset to default**

> **Tip**
>
> **TFTP Bootloader should be disabled during normal operation. The setting should only be enabled before firmware update.**

Restoring factory settings

To restore the module to factory settings:

1. Make sure the device is powered up,
2. Press and hold the RESET button for 10 to 15 seconds,
3. Release the RESET button when "rSt" appears on the display,

Once the above steps have been completed, the device will be set to the following parameters:

- **DHCP:** enabled
- **IP address:** 192.168.111.15
- **IP mask:** 255.255.255.0
- **User:** admin
- **Password:** admin00

Warranty and manufacturer's liability

> **Warning**
>
> **The manufacturer provides a two-year warranty for the device and post-warranty service for a period of 10 years from the date of introduction of the device to the market. The warranty covers all material and production defects.**

The manufacturer undertakes to respect the warranty agreement, if the following conditions are met:

- All repairs, changes, expansions and device calibrations are carried out by the manufacturer or an authorized service center,
- The power supply system meets the applicable standards,
- The device is operated in accordance with the suggestions presented in this manual,
- The device is operated in accordance with its intended purpose.

The manufacturer assumes no responsibility for consequences resulting from improper installation, improper use of the device, failure to comply with the instruction manual, and repairs made by unauthorized personnel.

> **Warning**
>
> **The device contains no user serviceable parts inside.**

Storage, operation and transport conditions

The device should be stored in enclosed rooms, where the atmosphere is free from vapours and corrosive substances:

- Environment temperature from -30°C to +60°C (-22°F - 140°F),
- Humidity from 25% to 90% (condensation unacceptable),
- Atmospheric pressure from 700 to 1060 hPa.

The device is intended to operate in the following conditions:

- Environment temperature from -10°C do +55°C (14°F - 131°F),
- Humidity from 30% to 75%,
- Atmospheric pressure from 700 to 1060 hPa.

Recommended transport conditions:

- Environment temperature from -40°C do +85°C (-40°F - 185°F),
- Humidity from 5% to 95%,
- Atmospheric pressure from 700 to 1060 hPa.

Installation and device operation:

- The module should be operated in accordance with recommendations provided later in this manual.

Disposal and decommissioning

In an event the device needs to be decommissioned (eg. after its intended life period is surpassed), it is recommended to contact the manufacturer or his representative, who are responsible to respond appropriately, i.e., to collect the device from the user. The user can alternatively contact companies specializing in electronic device or computer equipment disposal and/or decommissioning. Under no condition should the device be placed with other waste.