

User manual

Monitoring and controlling Hero Web Sensor



Soft >= 1.00

Dear Customer!

Thank you very much for choosing our product. Before its use, please read these instructions carefully. Here you find the most appropriate ways of dealing with this device, the basic principles of safety and maintenance. Please, also keep the user manual so that you can read it during later use.

Attention!

The manufacturer is not liable for any damage caused by improper use of the device which differ from its intended purpose, or improper handling, as well as a fault of driver resulting from improper use.

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1 Preliminary information

Before starting work with the device, read The User manual and follow the instructions contained therein!

Description of visual symbols used in this user manual:



This symbol is responsible for reviewing the appropriate place in the user instructions, warnings and important information. Failure to follow warnings could cause injury or damage to the device



Important information and guidelines



Following this guidelines makes the use of the device easier

Attention: The screenshots in this manual can be dissimilar from actual images at the time of the device purchase. Due to continuous development of the devices software, some of the functions may differ from these in the manual. The manufacturer claims no responsibility for any undesirable effects (misunderstanding) caused by changes of the software.

2 Application of the device

The HERO module is designed to monitor parameters such as temperature, humidity, contact, leakage, etc.

Up to four different types of sensors can be connected to the module.

The temperature readout is available on the embedded website and through the protocols: HTTP GET, Modbus TCP, SNMP and MQTT. The device can send the temperature exceeded state to other Inveo modules, causing eg remote activation of the relay.

3 Warranty and liability of the manufacturer



The manufacturer provides a 2-year warranty on the device. The manufacturer also provides post-warranty service for 10 years from the date of the introducing the device on the market. The warranty covers all defects in material and workmanship.

The manufacturer undertakes to comply with the contract of guarantee, if the following conditions are met:

- all repairs, alterations, extensions and device calibrations are performed by the manufacturer or authorized service,
- supply network installation meets applicable standards in this regard,
- the device is operated in accordance with the recommendations outlined in this manual,
- the device is used as intended.

The manufacturer assumes no responsibility for consequences resulting from improper installation, improper use of the device, not following this manual and the repairs of the device by individuals without permission.



This device doesn't contain serviceable parts.

4 Safety guidelines

The device has been designed and built using modern electronic components, according to the latest trends in the global electronics. In particular, much emphasis was placed on ensuring optimum safety and reliability of control. The device has a housing with a high-quality plastic.

4.1 Storage, work and transport conditions

The device has to be stored in enclosed rooms which are free of caustic vapors and substances and also meet the requirements:

- surrounding temperature from -30°C to $+60^{\circ}\text{C}$,
- humidity from 25 to 90%,
- atmospheric pressure from 700 to 1060hPa.

The device working conditions:

- surrounding temperature from -10°C to $+55^{\circ}\text{C}$,
- relative humidity from 30% to 75%,
- atmospheric pressure from 700 to 1060hPa.

Recommended transport conditions:

- surrounding temperature from -40°C to $+85^{\circ}\text{C}$,
- relative humidity from 5% to 95%,
- atmospheric pressure from 700 to 1060hPa.

4.2 Installation and use of the device

 **The device should be used following the guidelines shown in next part of the user manual.**

4.3 Decommissioning of the device

When it becomes necessary to recycle the device (for instance, to decommission the device from service), please contact the manufacturer or its representative, who are obliged to respond, appropriately, i.e. collecting the device from the user. You can also ask the companies involved in recycling of electrical or computer equipment. Under no circumstances should you place the device along with other waste material.

5 Construction of the device

5.1 Technical data

Power supply:

PoE: 33-57V POE IEEE 802.3af

DC: 12-24VDC (screw terminals 3,5mm)

Power consumption: max 1,5W

Input:

Input type: 1-wire bus

Supported sensors: temperature / humidity / digital inputs

Outputs:

OUT1:

Output type: relay, NO,

Maximum load current of relay 1A @ 30VDC,

Switch-on time: 1ms,

Switch-off time: 5ms,

Operating mode: bistable, astable, monostable.

OUT2:

Output type: transistor OC

NO output (normally open),

Switching time: <1ms,

Switch-off time: <1ms,

Operating mode: bistable, astable, monostable

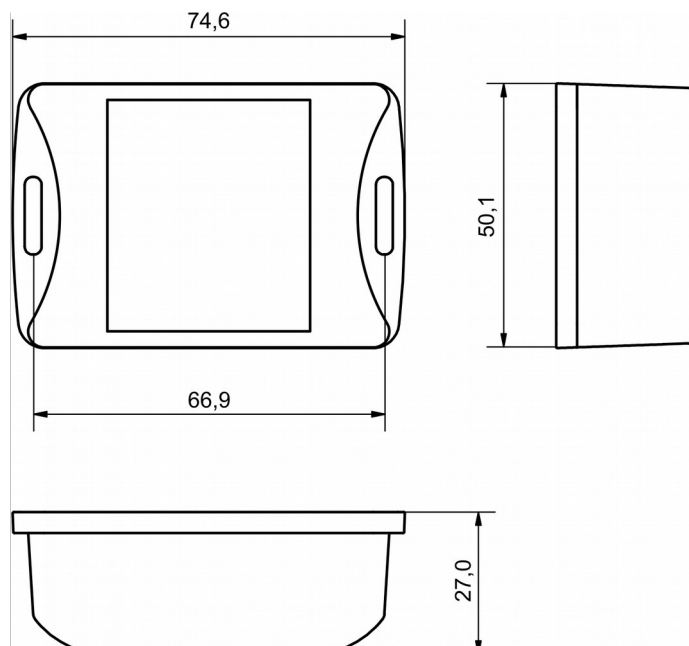
LAN:

Ethernet 1x10Mbps, RJ45

Housing:

IP Code: 30

Dimensions:



5.2 General features

Overall view of the module is shown on the picture below.



Communication with the module is done over the LAN.

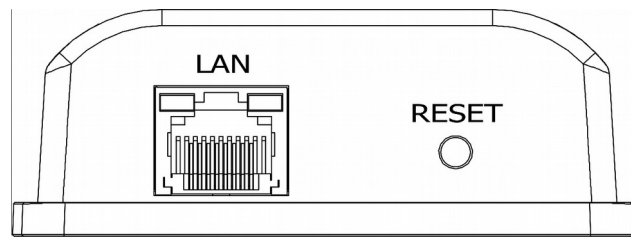
The following options for reading measured values are available:

- using built in WWW server via any web browser,
- from the windows / linux command line.
- HTTP protocol
- MQTT protocol
- e-mail
- SNMP protocol
- via syslog
- MODBUS TCP protocol

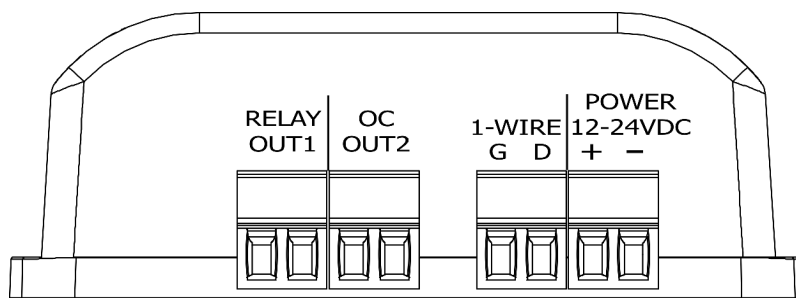
The module is equipped with an LED display on which measured values can be presented.

5.3 Description of the module connectors

The module is equipped with the following connectors:



- **LAN** – connection of LAN and power PoE IEEE 802.3af
- **RESET** – a button to enabling the DHCP, checking the current IP address and restoring the module to the factory settings



- **RELAY OUT1** – screw connection for relay output,
- **OC OUT2** – screw connection for transistor output,
- **POWER** – power connection. An additional power connection used in the event of a PoE power failure. Power supply voltage 12-24VDC.

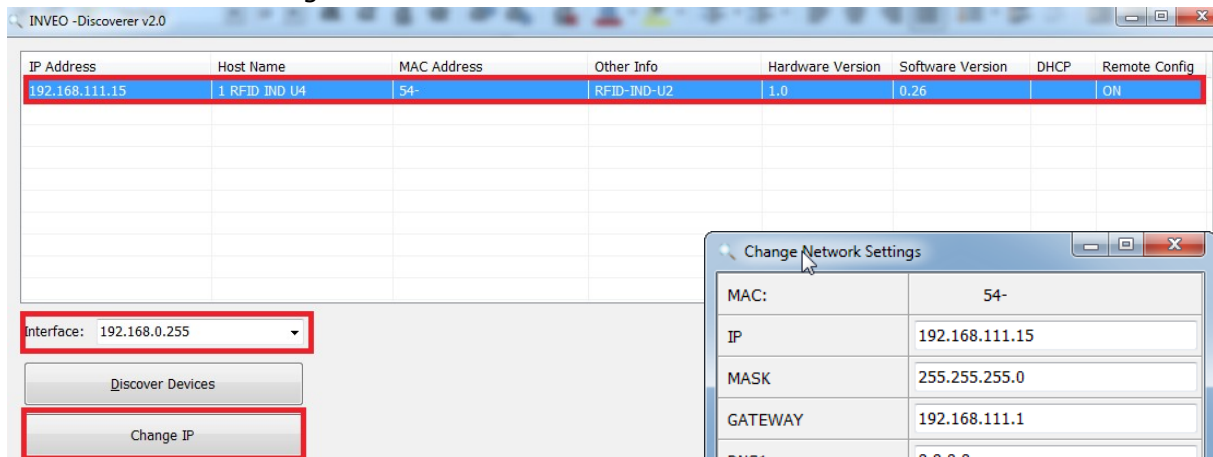
6 Configuration of the device

The device when used for first time needs to be configured.

There are two methods to do so. The network configuration can be easily changed by Inveo "Discoverer" (<https://inveo.com.pl/software/>) software:

6.1 Changing the device's IP address by Discoverer application.

When the "Discoverer" is opened and the relevant device is found, choose Interface list box and click on Change IP button.



In a new opened dialog box, settings such as IP address, MASK, GATEWAY, DNS1/DNS2 and the Host name can be changed.

Please save correct settings by choosing **Change** button.

If **Remote Config** is disabled (enabled by default), it is necessary to configure the device by changing the computer's subnet (chapter 6.2).

To enable the remote configuration it is necessary to enter **Administration** tab and mark **Enable Remote Network Config**.



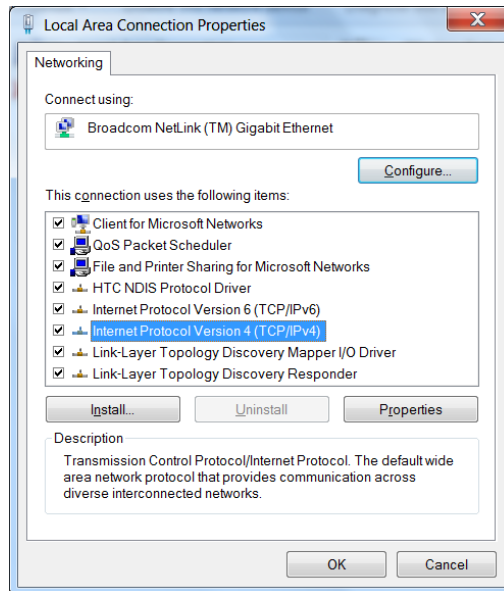
Save the setup by selecting **Save Config** button.

6.2 Changing the PC's subnet address, for the device configuration

After the device is connected to a network, a subnet address of a PC which is connected to the same network has to be changed.

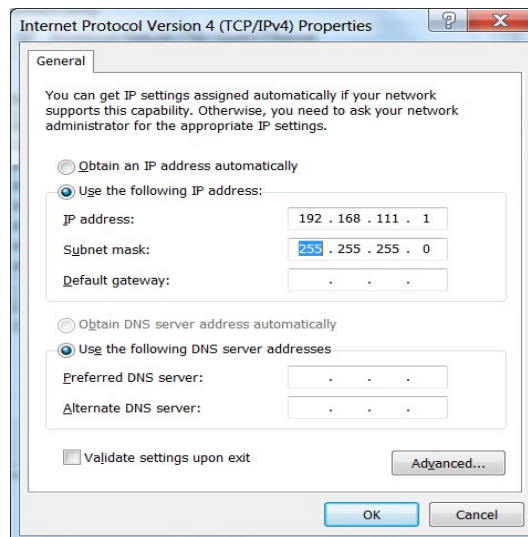
To do so, go to the PC's MS Windows network configuration: Start->Control panel ->Network and Sharing Center->Network and Internet->Network Connections, choose the related controller and right click on „Properties“.

After selecting this option configuration window will show up:



Changing network settings in MS WINDOWS

Next choose "Internet Protocol (TCP/IP)", double click on it and enter following settings:



Illustrative TCP/IP protocol settings

After saving changes by clicking OK, open an Internet browser and enter in the browser's address line: **192.168.111.15**.

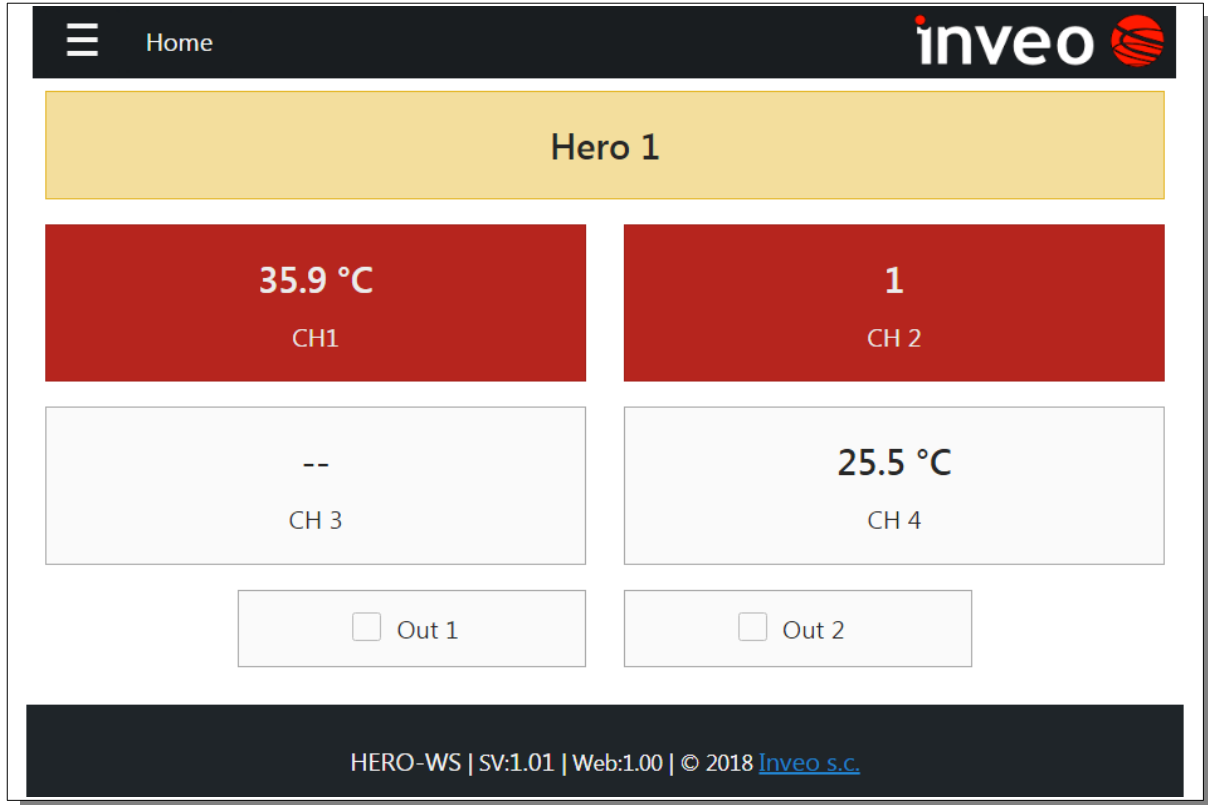
Default user name/password: admin/admin00

7 The module's web interface

After logging in correctly to the device, the user can check the current status of the outputs and the values measured by the sensors on individual channels.

On the home page, alarm states and warning states are also signaled.

The window with the temperature highlighted in yellow means the warning state while the window highlighted in red is the alarm state.



Sensor names can be changed in the tab Menu → Sensors, names of outputs in the tab Menu → Outputs. The maximum length of the text is 15 characters. The name of the module "Hero 1" can be changed in the tab Menu → Administration → module name.

The LED display can show the measured values in the form:

-temperature:

T1 **24.3**

t2 **-4.3**

-humidity:

rh1 **47.1**

rh3 **23.4**

-input status:

in1 **on**

in2 **off**

-output status:

out1 **off**

Out2 **on**

7.1 Sensor settings: Menu-> Sensors

Various types of sensors can be connected to the sensors input, eg temperature, humidity, etc. For each sensor, parameters such as: upper, lower alarm range, hysteresis, channel name, etc. can be set.

Sensors

Sensor configuration

Sensor # 1 Save

Sensor		
Name	Value	Description
1-Wire address Temp	<input style="width: 80%;" type="text" value="286E451806000000"/>	Assign Remove
Name	<input style="width: 80%;" type="text" value="CH1"/>	
View 7-LED	<input checked="" type="checkbox"/>	View value at device's LED display.
View Web Box	<input checked="" type="checkbox"/>	Display sensor box on main site.
Logger	<input checked="" type="checkbox"/>	Enable log to internal storage.
Hysteresis	<input style="width: 50%;" type="text" value="2"/>	Sensor hysteresis for warn.
Correction	<input style="width: 50%;" type="text" value="-0,9"/>	Sensor correction (+/- 10.0)
Low warn	<input style="width: 50%;" type="text" value="1"/>	Low warn setpoint
Low alarm	<input style="width: 50%;" type="text" value="1"/>	Low alarm setpoint
High warn	<input style="width: 50%;" type="text" value="45"/>	High warn setpoint
High alarm	<input style="width: 50%;" type="text" value="55"/>	High alarm setpoint
Info period	<input style="width: 50%;" type="text" value="10"/>	Info time [s]

-Sensor -the number of the currently configured sensor (1..4)

-1-Wire address -address of the sensor connected to the bus. Athis address can be assigned automatically by selecting the **Assing** button or by entering the value manually.

-Name -the name of the sensor. Maximum length 15 characters.

-View 7-LED -displaying values from the sensor. The data read from the sensors can be sequentially displayed on the LED display.

-View Web Box -displaying values from the sensor on the main page of the module

-Logger -saving values from the sensor to the module's memory

- Hysteresis** -sensor hysteresis setting (temperature / humidity) in the range(0..10)
- Correction** -correction of sensor readings (temperature / humidity) in the range (-10..10)
- Low warn** -lower temperature or humidity level for warnings
- Low alarm** -lower temperature or humidity level for alarms
- High warn** -upper temperature or humidity level for warnings
- High alarm** -upper temperature or humidity level for alarms
- Info period** -setting the frequency of sending information messages

The Hero module can react to exceeded measured values, sensor errors or send information at a specific time interval.

Warn Matrix						
	Info	Alarm L	Warn L	Warn H	Alarm H	Error
Enable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Out 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Out 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E-mail On	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E-mail Off	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SNMP Trap	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HTTP On	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HTTP Off	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MQTT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Syslog	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

We can choose the following events to which the module will react:

- Info** -sending information messages at a specific time interval
- Alarm L** -sending messages when the lower alarm threshold is exceeded
- Warn L** -sending messages when the lower warning threshold is exceeded
- Warn H** -sending messages when the upper warning threshold is exceeded
- Alarm H** -sending messages when the upper alarm threshold is exceeded
- Error** -sending messages about sensor faults

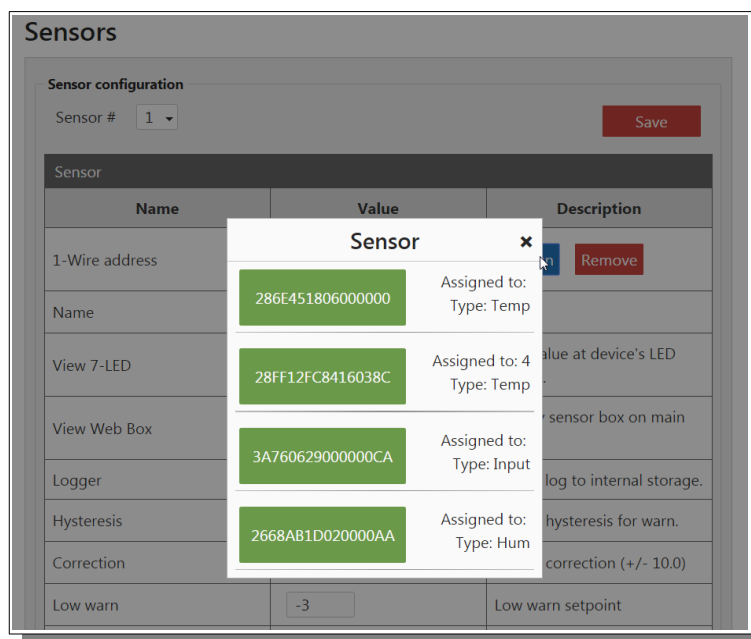
Module response to events:

- Enable** -activation / deactivation of reaction to an event (eg Info, Error, Alarm L). If Enable is inactive, the module does not control the set thresholds so that the Home page will not highlight the table in yellow and red.

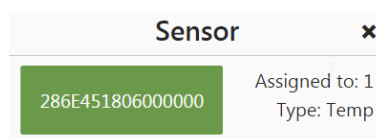
- Out 1** -switching on / off channel number 1
- Out 2** - switching on / off channel number 2
- email On** -sending an e-mail message to the occurrence of the event
- email Off** -sending an e-mail back to normal
- SNMP Trap** -sending a Trap message via SNMP protocol at the occurrence of the event and returning to the normal state
- HTTP On** -sending a TCP frame with the HTTP protocol - reaction to the occurrence of the event
- HTTP Off** -TCP frame creation with HTTP protocol - reaction to return to the state of standards.
- MQTT** -reaction to the occurrence of the event and to return to the normal state
- Syslog** -reaction to the occurrence of the event and to return to normal; see menu Services → SYSLOG

Adding sensors:

After correct connection of the sensors to the 1-Wire bus, the detected sensors should be assigned to the appropriate channels. To do this, click the button Assign the detected sensors on the bus will be displayed. The assignment takes place after clicking on the appropriate green field with the sensor's address.



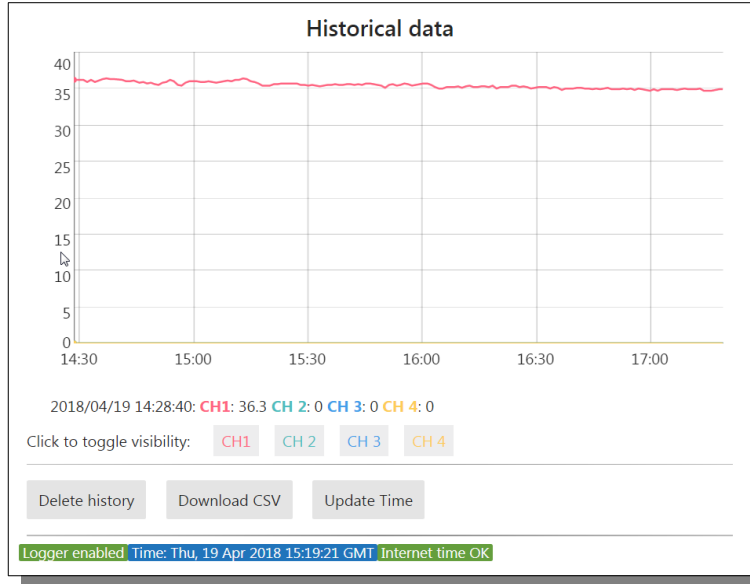
The sensor assigned to the channel will be displayed as follows:



In this case, the sensor is assigned to channel 1 and it is a temperature sensor.

7.2 Data logging: Menu → History

The data read from the input channels can be saved to the internal memory. Data from the memory can be seen in the time function on the chart or you can download the csv file.



The csv file format consists of:

timestamp -unix timestamp - the number of seconds counted from 1970-01-01 00:00:00

sensor1..sensor4 -data from input channels

Data from the module are in the resource log.csv np. <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
1524141191	36.3	0.0	0.0	0.0
1524141252	36.0	0.0	0.0	0.0
1524141374	36.4	0.0	0.0	0.0
1524141435	36.5	0.0	0.0	0.0
1524141495	36.4	0.0	0.0	0.0
1524141556	36.4	0.0	0.0	0.0
1524141681	36.3	0.0	0.0	0.0
1524141742	36.1	0.0	0.0	0.0

Assuming logging in every 1 minute, 41 days of measurements will be stored in memory.

7.3 Output parameters: Menu → Outputs

The Hero module has 2 output channels

- relay channel -OUT1
- transistor channel OC -OUT2

Channels can work in several modes:

Outputs configuration

Channel 1 - Out 1		
Name	Value	Description
Name	<input type="text" value="Out 1"/>	0..15 characters
Output mode	<input type="text" value="Bistable"/>	Output mode
Time On	<input type="text" value="20"/>	x 0.1s (ie. 15 means 1,5 second)
Time Off	<input type="text" value="20"/>	x 0.1s (ie. 15 means 1,5 second)
Power on state	<input type="checkbox"/>	
Invert out	<input type="checkbox"/>	Invert output state (NO->NC)

-**Name** -channel name (maximum length 15 characters)

-**Output mode:**

- Bistable
- Astable
- TimeBase

-**Time On**

-**Time Off**

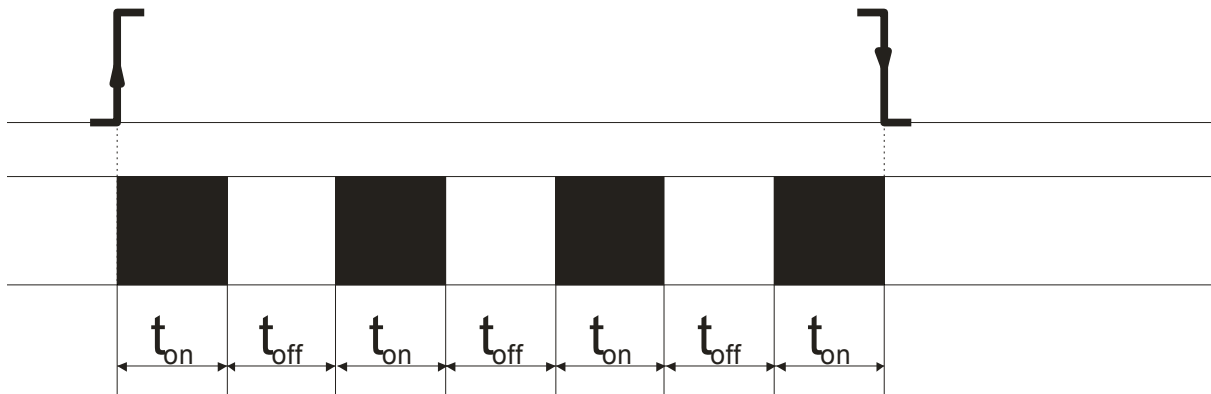
-**Power on state** -channel status after power on

-**Invert out** -program change of the output status from NO to NC

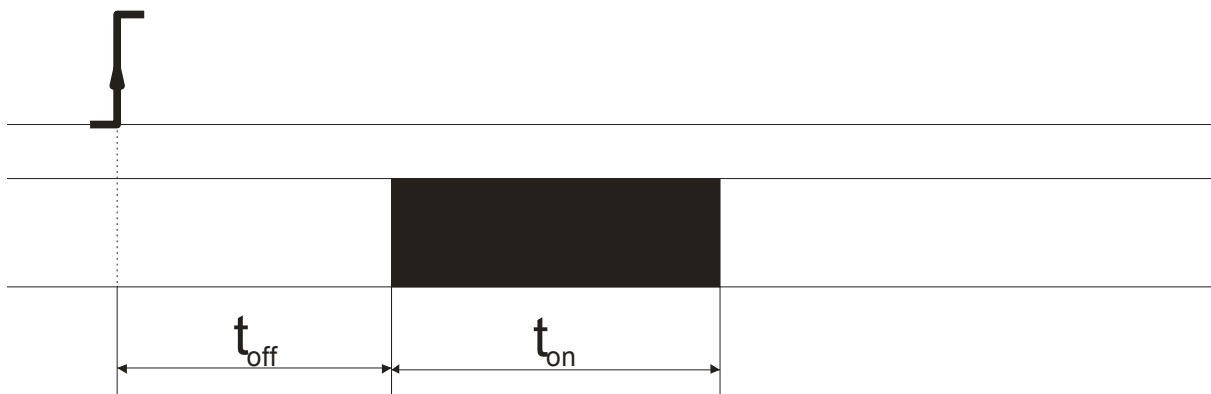
Configuration of relay outputs

Each output can work in 3 modes:

- **Bistable** – the relay has a fixed position (switched on or off).
- **Astable** – intermittent mode. After switching on the channel, the relay cyclically short-cuts and opens the contacts. The time of shorting and opening of the contact is determined by times:
 - **Time On**
 - **Time Off**



- **TimeBased** – single-trip mode. If in mode **TimeBase** times $t_{on} > 0$ and $t_{off} > 0$ tafter releasing the output, the relay will turn on after time t_{off} on time t_{on} .



- If in mode **TimeBased** times $t_{on} > 0$ and $t_{off} = 0$ after relaying the output, the relay will turn on on time t_{on} and then it will be turned off.



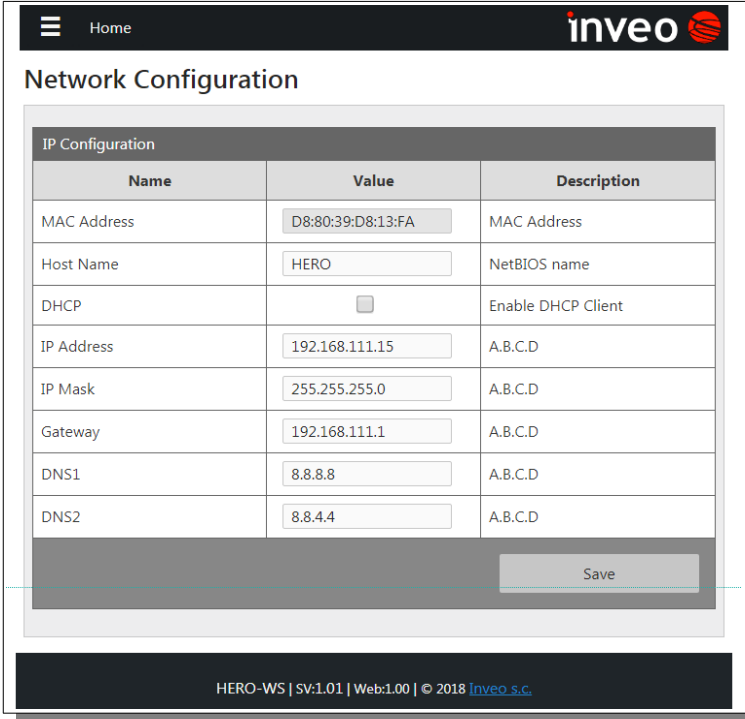
- If in mode **TimeBased** times $t_{on} = 0$ and $t_{off} > 0$ after relaying the output, the relay will turn on after time t_{off}



Time charts of relay modes.

7.4 Network settings: Menu → Network

Network configuration takes place on the website Menu → Network.



Home **inveo**

Network Configuration

IP Configuration		
Name	Value	Description
MAC Address	D8:80:39:D8:13:FA	MAC Address
Host Name	HERO	NetBIOS name
DHCP	<input type="checkbox"/>	Enable DHCP Client
IP Address	192.168.111.15	A.B.C.D
IP Mask	255.255.255.0	A.B.C.D
Gateway	192.168.111.1	A.B.C.D
DNS1	8.8.8.8	A.B.C.D
DNS2	8.8.4.4	A.B.C.D

Save

HERO-WS | sv:1.01 | Web:1.00 | © 2018 Inveo S.C.

The default user and password is: admin/admin00

To configure the network interface of the module are fields:

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



After making changes, click the button **Save**.

7.5 Service settings: Menu → Services

7.5.1 Communication via HTTP

The HERO module can send event information via HTTP protocol using GET or POST.

Services

HTTP	MQTT	E-mail	SNMP	Syslog	SNTP	Modbus
------	------	--------	------	--------	------	--------

HTTP

Name	Value	Description
Enable Service	<input type="checkbox"/>	
Server Address	<input type="text"/>	IP or domain name
Server port	<input type="text"/>	
HTTP Method	GET ▾	
Resource	<input type="text"/>	eg. / or /upload/data.php
Username	<input type="text"/>	optional
Password	<input type="text"/>	optional

- Enable Service** -turning on the service
- Server Address** -the address of the HTTP server to which the information will be sent
- Server Port** -the port on which the http server listens
- HTTP Method** -method of sending messages (GET or POST)
- Resource** -the resource the module will refer to
- Username**
- Password**

Examples of http requests

Http requests	Description
ch=[1..4]	The channel number from which the information comes from.
val=	The measured value.
notify=[0..1]	Always notify = 1 means that the message is informational.
warnHi=[0..1]	If warnHi=1 means that the upper warning value has been exceeded. If warnHi=0 means that the transition to normal status has taken place.
warnLo=[0..1]	If warnLo=1 means that the lower value of the warning has been exceeded. If warnLo=0 means that the transition to normal status has taken place.
alarmHi=[0..1]	If alarmHi=1 means that the upper alarm value has been exceeded. If alarmHi=0 means that the transition to normal status has taken place.
alarmLo=[0..1]	If alarmLo=1 means that the lower alarm value has been exceeded. If alarmLo=0 means that the transition to normal status has taken place.
error=[0..1]	If error=1 means that the sensor has been damaged or missing. If error=0 means that the transition to normal status has taken place.

Examples of http requests:

/test.php?ch=2&val=26.4¬ify=1

/test.php?ch=2&val=1.4&alarmHi=1

7.5.2 Communication via the MQTT Inveo protocol

After enabling Mqtt Service module sends to the mqtt broker value of measured temperature every defined period of time.

There are many applications on Android, IOS or PC that can display data sent by the module.

Name	Value	Description
Enable Service	<input type="checkbox"/>	
Server Address	<input type="text"/>	IP or domain name
Server port	<input type="text"/>	
Topic	<input type="text"/>	/sensor/home
Username	<input type="text"/>	optional
Password	<input type="text"/>	optional
QOS	0 ▾	

- **Enable Service** -enabling MQTT service
- **Server Address** -the address of server MQTT (maximum 24 characters)
- **Server port** -server listening port (generally 1883)
- **Topic** -Topic of the message (the topic must be in the format e.g. /sensor/home -without the "/" sign at the end of the line)
- **Username** -mqtt username
- **Password** -mqtt user password
- **QOS** -Quality of Service

Warning:

The name of the sensor is automatically added to the topic of the message.

For channel 1 -sensor1 (/sensor/home/sensor1)

For channel 2 -sensor2 (/sensor/home/sensor2)

Data can be sent during a specific time interval or after warning and alarm thresholds

7.5.3 Sending e-mail

If the e-mail service is enabled module send measured value or warnings every defined period of time.

Services

HTTP	MQTT	E-mail	SNMP	Syslog	SNTP	Modbus
------	------	--------	------	--------	------	--------

E-mail

Name	Value	Description
Enable Service	<input type="checkbox"/>	
Server Address	<input type="text"/>	IP or domain name
Server port	<input type="text" value="0"/>	
Recipient	<input type="text"/>	somebody@example.com
User	<input type="text"/>	Server username (opt)
Pass	<input type="text"/>	Server Password (opt)

-**Enable Service** -enabling E-mail service

-**Server Address** -e-mail server address entered in the form of an IP number or domain with a maximum length of 24 characters.

-**Server port** -e-mail server listening port

-**Recipient** - the recipient of the e-mail

-**Username** -user name

-**Password** -user password

An exemplary e-mail:

Topic: Hero 1 -CH1 - Notify

Contents: 23.4

7.5.4 Communication via SNMP protocol

The module is equipped with a SNMP v2c server.

The SNMP protocol allows you to read the current values taken from the sensors.

The MIB file describing the structure is available for download in the SNMP tab.

Services

HTTP MQTT E-mail **SNMP** Syslog SNTP Modbus

SNMP		
Name	Value	Description
Enable Service	<input checked="" type="checkbox"/>	
Read community	<input type="text" value="read"/>	
Write community	<input type="text" value="write"/>	
Enable Trap	<input checked="" type="checkbox"/>	
Trap IP	<input type="text" value="192.168.0.83"/>	IP or domain name
Trap community	<input type="text"/>	

[Download MIB file](#)

-Enable Service -enabling SNMP service

-Read community -password to read data

-Write community -password to save data

-Enable Trap -enabling SNMP TRAP service

-Trap IP -the address to which TRAP messages will be sent

Download MIB file -link to download the MIB file.

The basic parameters that can be read from the Hero module can be found in the table:

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 x10 temperature	Integer	.1.3.6.1.4.1.42814.12.5.1.6.0
Channel 2 x10 temperature	Integer	.1.3.6.1.4.1.42814.12.5.1.6.1
Channel 3 x10 temperature	Integer	.1.3.6.1.4.1.42814.12.5.1.6.2
Channel 4 x10 temperature	Integer	.1.3.6.1.4.1.42814.12.5.1.6.3
Sensor type for the channel 1	Integer	.1.3.6.1.4.1.42814.12.5.1.3.0
Sensor type for the channel 2	Integer	.1.3.6.1.4.1.42814.12.5.1.3.1
Sensor type for the channel 3	Integer	.1.3.6.1.4.1.42814.12.5.1.3.2
Sensor type for the channel 4	Integer	.1.3.6.1.4.1.42814.12.5.1.3.3

The module allows sending TRAP messages in the event of a channel state change every defined time or on the occurrence of alarms. The destination address is entered in the fields **Trap IP**.

7.5.5 Communication via Syslog

The HERO module can send messages to the Syslog server. Messages can be sent at specified intervals (Info) or when an event such as exceeding the set temperature / humidity thresholds, sensor damage occurs.

Services

HTTP	MQTT	E-mail	SNMP	Syslog	SNTP	Modbus
------	------	--------	------	--------	------	--------

Syslog

Name	Value	Description
Enable Service	<input checked="" type="checkbox"/>	
Server Address	<input type="text" value="192.168.0.101"/>	IP or domain name
Server port	<input type="text" value="514"/>	
Facility level	<input type="text" value="Syslog"/>	
Notify Severity	<input type="text" value="Emergency"/>	
Warning Severity	<input type="text" value="Emergency"/>	
Alarm/Error Severity	<input type="text" value="Emergency"/>	

- Enable Service** -enabling Syslog service
- Server Address** -Syslog server address entered as an IP number or domain with a maximum length of 24 characters
- Server port** -the port on which the Syslog server is listening
- Facility level** -source of information. We can choose: Kernel, User, Mail, Daemon, Auth, Syslog, News etc.
- Notify Severity** -event triggered if the **Info** option in the event matrix is selected
- Warning Severity** -event triggered if **Warn L** or **Warn H** is selected in the event matrix
- Alarm/Error Severity** -event triggered if **Alarm L**, **Alarm H** or **Error** is selected in the event matrix

7.5.6 Communication via SNTP

Hero does not have a built-in real-time clock. It can, however, download the current time from the Internet via the SNTP protocol. This time is used to log data in the device's internal memory. Time synchronization occurs every 10 minutes.

Services

HTTP	MQTT	E-mail	SNMP	Syslog	SNTP	Modbus
------	------	--------	------	--------	------	--------

SNTP

Name	Value	Description
Enable Service	<input type="checkbox"/>	
Server Address	<input style="width: 100%;" type="text"/>	IP or domain name

-**Enable Service** -enabling service

-**Server Address** -SNTP server address

Examples of SNTP servers:

IP address	stratum	source
5.226.98.186	1	rubidium atomic pattern of STANFORD Research, ELPROMA Łomianki near Warsaw
193.110.137.171	1	atomic cesium clock 5071A Institute of Communications in Warsaw
150.254.183.15	3	news-archive.icm.edu.pl (stratum 2), 247.92.156.107 (stratum 1)
158.75.5.245	1	Polish Optical Atomic Clock located at the Institute of Physics of the Nicolaus Copernicus University in Toruń and the National Laboratory of FAMO

7.5.7 Communication via Modbus

Data from the HERO module can be read and written using the MODBUS TCP protocol. The device supports the following MODBUS functions:

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

The contents of the registers are presented in the tables below.

Services

HTTP	MQTT	E-mail	SNMP	Syslog	SNTP	Modbus
------	------	--------	------	--------	------	--------

Modbus TCP

Name	Value	Description
Enable Service	<input checked="" type="checkbox"/>	
Server port	<input type="text" value="502"/>	

Save

-**Enable Service** -enabling Modbus TCP service

-**Server port** -port on which the Modbus TCP client is listening

MODBUS TCP – Holding Registers

Address	Name	R/W	Description
1000	Channel1 x 10	R	The value read from channel number 1: for temperature and humidity multiplied x 10 for digital input 1 or 0
1001	Channel1 Integer Fraction	R	The total part of the value read from the channel 1
1002	Channel1 Decimal Fraction	R	The decimal part of the value read from the channel 1
1003	Channel2 x 10	R	The value read from channel number 2: for temperature and humidity multiplied x 10 for digital input 1 or 0
1004	Channel2 Integer Fraction	R	The total part of the value read from the channel 2
1005	Channel2 Decimal Fraction	R	The decimal part of the value read from the channel 2
1006	Channel3 x 10	R	The value read from channel number 3: for temperature and humidity multiplied x 10 for digital input 1 or 0
1007	Channel3 Integer Fraction	R	The total part of the value read from the channel 3
1008	Channel3 Decimal Fraction	R	The decimal part of the value read from the channel 3
1009	Channel4 x 10	R	The value read from channel number 4: for temperature and humidity multiplied x 10 for digital input 1 or 0
1010	Channel4 Integer Fraction	R	The total part of the value read from the channel 4
1011	Channel4 Decimal Fraction	R	The decimal part of the value read from the channel 4

MODBUS TCP – Coils

Address	Name	R/W	Description
1000	Channel1 Sensor Failure	R	Damage to the sensor in the channel 1
1001	Channel1 Warning Low	R	Exceeding the lower warning threshold in the channel 1
1002	Channel1 Alarm Low	R	Exceeding the lower alarm threshold in channel 1
1003	Channel1 Warning High	R	Exceeding the upper warning threshold in the channel 1

Address	Name	R/W	Description
1004	Channel1 Alarm High	R	Exceeding the upper alarm threshold in channel 1
1005	Channel1 Error	R	Damage to the sensor in the channel 1
1006	Channel2 Sensor Failure	R	Damage to the sensor in the channel 2
1007	Channel2 Warning Low	R	Exceeding the lower warning threshold in the channel 2
1008	Channel2 Alarm Low	R	Exceeding the lower alarm threshold in channel 2
1009	Channel2 Warning High	R	Exceeding the upper warning threshold in the channel 2
1010	Channel2 Alarm High	R	Exceeding the upper alarm threshold in channel 2
1011	Channel2 Error	R	Damage to the sensor in the channel 2
1012	Channel3 Sensor Failure	R	Damage to the sensor in the channel 3
1013	Channel3 Warning Low	R	Exceeding the lower warning threshold in the channel 3
1014	Channel3 Alarm Low	R	Exceeding the lower alarm threshold in channel 3
1015	Channel3 Warning High	R	Exceeding the upper warning threshold in the channel 3
1016	Channel3 Alarm High	R	Exceeding the upper alarm threshold in channel 3
1017	Channel3 Error	R	Damage to the sensor in the channel 3
1018	Channel4 Sensor Fail	R	Damage to the sensor in the channel 4
1019	Channel4 Warning Low	R	Exceeding the lower warning threshold in the channel 4
1020	Channel4 Alarm Low	R	Exceeding the lower alarm threshold in channel 4
1021	Channel4 Warning High	R	Exceeding the upper warning threshold in the channel 4
1022	Channel4 Alarm High	R	Exceeding the upper alarm threshold in channel 4
1023	Channel4 Error	R	Damage to the sensor in the channel 4
1024	1-Wire Bus Error	R	Short-circuit of the bus
1025	On OUT 1	R/W	Switching on / off the output 1
1026	Coil OUT 1	R	Output state 1
1027	On OUT 2	R/W	Switching on / off the output 2
1028	Coil OUT 2	R	Output state 2

7.5.8 HTTP resources

The modules can be controlled using the HTTP get protocol.

- ow.xml -resource containing information about the bus
- sensor.xml -resource containing detailed information about channel settings
- sensorState.xml -resource containing information about the state of the sensors
- status.xml -resource containing basic information about the module
- stat.php -zasób do sterowania wyjściami

Resources can be downloaded in a format json: ow.json, sensor.json, sensorState.json, status.json.

To read the current state of the module, you can refer to a resource in an Internet browser, e.g. <http://192.168.111.15/status.xml>

The status.xml resource has all relevant information:

```
<response>
<prod_name>HERO-WS</prod_name>
<sv>1.01</sv>
<mac>D8:80:39:D8:13:FA</mac>
<out>00000000</out>
<on>00000000</on>
<bus>1</bus>
</response>
```

Section	Description
<prod_name>HERO-WS</prod_name>	Module type In this case HERO-WS
<sv>1.01</sv>	The software version of the module
<mac>54:10:EC:65:88:2B</mac>	MAC address of the module. Unique for each device.
<out>00000000</out>	Status of relay output and OC
<on>00000000</on>	State of the relay channel and OC
<bus>1</bus>	1-bus OK, 0-bus short

Resource ow.xml

Section	Description
<address>286E451806000000</address>	The unique address of the sensor
<failure>0</failure>	Sensor read error
<error>0</error>	Counter of sensor read error
<val_a>558</val_a>	RAW data from sensors
<val_b>0</val_b>	RAW data from sensors
<val_c>0</val_c>	RAW data from sensors
<finalValA>348</finalValA>	Diagnostic data
<finalValB>946</finalValB>	Diagnostic data
<assigned>1</assigned>	

Resource sensor.xml

Section	Description
<address>286E451806000000</address>	The unique address of the sensor
<name>CH1</name>	Channel name
<hysteresis>0</hysteresis>	Channel hysteresis [0..10]
<correction>0</correction>	Indication correction [-10..10]
<fBoxVisible>1</fBoxVisible>	Visibility of the measurement on the main page
<fLogger>1</fLogger>	Logging measurements to memory
<fShowLed>1</fShowLed>	Displaying measurements on the LED display
<lowWarn>0</lowWarn>	Lower warning threshold
<lowAlarm>0</lowAlarm>	Lower alarm threshold
<highWarn>1</highWarn>	Upper warning threshold
<highAlarm>1</highAlarm>	Upper warning threshold
<infoTime>8</infoTime>	The time interval for sending information messages
<lowWarnFlags>000000000100001</lowWarnFlags>	Flags from the table of warnings
<lowAlarmFlags>000000000100001</lowAlarmFlags>	Flags from the table of warnings
<highWarnFlags>000000000100001</highWarnFlags>	Flags from the table of warnings
<highAlarmFlags>0000001000100001</highAlarmFlags>	Flags from the table of warnings
<infoFlags>000000000101001</infoFlags>	Flags from the table of warnings
<errorFlags>000000000100001</errorFlags>	Flags from the table of warnings

Resource sensorState.xml

Section	Description
<present>1</present>	Sensor present on the bus
<lowWarn>0</lowWarn>	1-warning state active for the lower threshold
<lowAlarm>0</lowAlarm>	1-alarm state active for the lower threshold
<highWarn>1</highWarn>	1-warning state active for the upper threshold
<highAlarm>1</highAlarm>	1-alarm state active for the upper threshold
<error>0</error>	1-bus error
<value>35.1</value>	measured value
<unit>°C</unit>	Unit of measured value

Output control – resource stat.php

Request	Description
http://nr_ip/stat.php?on=x	Enabling output. x=output number HERO: x=[1..2]
http://nr_ip/stat.php?off=x	Disable output. x=output number HERO x=[1..2]
http://nr_ip/stat.php?inv=x	Change in the output status to the opposite. x=output number HERO x=[1..2]
http://nr_ip/stat.php?set=21	Setting all outputs. Possible options: 1-enabling 0-disabling n-change of state to the opposite - - without changing the state
http://nr_ip/stat.php? on=a&ton=x&toff=y&astab	
http://nr_ip/stat.php? on=a&ton=x&toff=y&bistab	
http://nr_ip/stat.php? on=a&ton=x&toff=y&timebased	

Examples of module control using the http protocol.

1. Enabling OUT1:

<http://192.168.111.15/stat.php?on=1>

2. Changing the relay output OUT1:

<http://192.168.111.15/stat.php?inv=1>

3. Disabling OUT2:

<http://192.168.111.15/stat.php?off=2>

4. Enabling OUT1; denial OUT2:

<http://192.168.111.15/stat.php?set=00000n1>

7.6 Module settings: Menu → Administration

Administration

Module name		
Name	Value	Description
Module name	<input type="text" value="Hero 1"/>	

User Password		
Name	Value	Description
New Password	<input type="text"/>	
Re-type Password	<input type="text"/>	

Admin Password		
Name	Value	Description
Current Password	<input type="text"/>	
New Password	<input type="text"/>	
Re-type password	<input type="text"/>	

-**Module name** - (maximum 15 characters)

User Password:

- New Password** - when changing the user's password
- Re-type Password** - when changing the user's password

Admin Password:

- Current Password** - when changing the administrator password
- New Password** - when changing the administrator password
- Re-type Password** - when changing the administrator

Settings		
Name	Value	Description
Enable User Password	<input checked="" type="checkbox"/>	
Enable Admin Password	<input type="checkbox"/>	
Unit	Celsius ▾	Select temperature unit.
Enable TFTP Bootloader	<input checked="" type="checkbox"/>	Allow remote upgrade firmware by TFTP. For safety reasons, the option should be disabled.

Logger		
Name	Value	Description
Enable logger	<input checked="" type="checkbox"/>	
Wait for NTP	<input type="checkbox"/>	Wait until SNTP gets current time from internet.
Log period	1	Period of store data. Given in minutes.

Factory settings		
Reset to default	<input type="text"/>	To reset the device type in this field 'reset' and click 'Save' button.

- Enable User Password** - enabling password for user
- Enable Admin Password** - enabling password for administrator
- Unit**- titles of the temperature sensor unit (degrees Celsius on Fahrenheit)
- Enable TFTP Bootloader** - enabling bootloadera
- Enable logger** - enabling logging of measured values into memory
- Wait for NTP** - waiting for clock synchronization with time from the internet
- Log period** - time period when saving data to memory (in minutes).

Attention!

TFTP Bootloader should be disabled during normal operation. Enable just before updating the software.

8 Communication with the module from the external network

If the module is in a different LAN network than the computer connecting to it, port forwarding is required.

Depending on the communication method used with the module, it is necessary to contact the Network Administrator and port forwarding:

Support via website and HTTP protocol:

- port TCP 80

Service by a computer program or by your own application:

- port TCP 9761

Support via MODBUS TCP:

- port TCP 502

Support via SNMP protocol:

- port UDP 161

9 Checking the IP address

To check the current IP address of the device:

1. Press and hold the reset button until the display shows the four parts of the IP number, e.g. **192 168 111 15**.
2. Release the reset button.

10 DHCP

To enable/disable DHCP service:

1. Press and hold RESET button (about 5 sec) until the display shows: **dhcP**.
2. Release the reset button.
3. Depending on the current DHCP setting, the message will be displayed **ON** or **OFF**.

It is also possible to enable DHCP in the network configuration in the **Network** tab or through Discoverer application.

11 Restoring factory defaults

In order to restore the module to its factory defaults:

1. Press and hold reset button (about 10 sec) until the display shows: **rSt**.
2. Release the reset button.

With factory defaults restored the module settings are as follows:

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

12 Firmware update

The device has the ability to update the firmware. The software update program is provided as a *.bin file.

Warning! Incorrect use of the update feature may damage the reader. Make sure that undisturbed power is provided to the device for duration of programming.

To update the software:

- check the **Enable TFTP Bootloader** option, which is located in the Administration tab,
- run the Windows command line (Start-> Run enter 'cmd' and confirm with the Enter key),
- go to the directory where the .bin file is located
- enter the command:

```
tftp -i <address_ip_of the reader> PUT file.bin
```

where: <address_ip_of the reader> is the IP Address of the reader
file.bin – the file with the update program

Programming takes 1-2 minutes. End of programming confirms the message 'File Transferred'.

For correct functioning of the reader, after the update operation the „**Enable TFTP Bootloader**“ option has to be switched off.

Step-by-step instruction for firmware updates is available at www.inveo.com.pl.

The latest instructions and software are available on the site www.inveo.com.pl.

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