User manual

Nano Temperature Sensor POE

Nano Temp Sensor

Dear Customer

Thank you very much for choosing our product. At the same time, please read this manual carefully before using it, as it provides the most appropriate ways of dealing with this appliance including basic safety and maintenance instructions. Please also retain the manual for future reference.

Remember!

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

Table of contents

1 Introductory information

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

Description of symbols used in this manual:

★ Warning   This symbol indicates an obligation to read the relevant place in the User Manual, warnings and important information. Failure to heed warnings may result in injury.

💬 Tip   Important instructions and information.

Observing the texts marked with this symbol facilitates operation.

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

2 Purpose of the device

The Nano Temperature Sensor is a device designed to transmit temperature readings via LAN. It provides the ability to monitor the temperature using the built-in website and the HTTP GET, Modbus TCP, SNMP and MQTT protocols. In addition, the device allows over-temperature notifications to be sent to other Inveo modules, allowing remote control of the relay or other actions suitable for such situations.

3 Warranty and liability of the manufacturer

★ Warning   The manufacturer shall provide a one-year warranty for the device and 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 honour the warranty 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
- in this manual,
- the appliance is used in accordance with its intended use.

The manufacturer shall not be held liable for any consequences resulting consequences of incorrect installation, improper use of the appliance, non-compliance with the operating instructions and repairs carried out by non-authorised persons.

★ Warning   There are no parts in the appliance that the user is allowed to replace by themselves.

4 Safety of 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 high-quality plastic housing.

4.1 Storage, operating conditions

The device should be stored in closed rooms where the atmosphere is free of vapours and corrosive agents and:
- an ambient temperature of -30°C to +60°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 -10°C to +55°C,
- humidity between 30% and 75%,
- atmospheric pressure of 700 to 1060hPa.

Recommended transport conditions:
- ambient temperature from -40°C to +85°C,
- humidity 5% to 95%,
- atmospheric pressure 700 to 1060hPa.

4.2 Installation and use of the module

The module should be operated as recommended later in this manual.

4.3 Disposal and decommissioning

In the event that it becomes necessary to dispose of the unit (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 unit from the user. The user may also contact companies dealing with the disposal and/or decommissioning of the appliance.

5 Module design

5.1 Nano Temperature Sensor PoE

Technical data:

Power supply:
>   PoE: 33-57V POE IEEE 802.3af
>   DC: 10-24VDC (3.5mm screw connector)
>   Power consumption: 1,5W

Inputs:
>   1 input: typ: 1-wire bus
>   Sensor type: DS18B20
>   measured temperature range: -55°C do +125°C
>   disconnectable screw connector
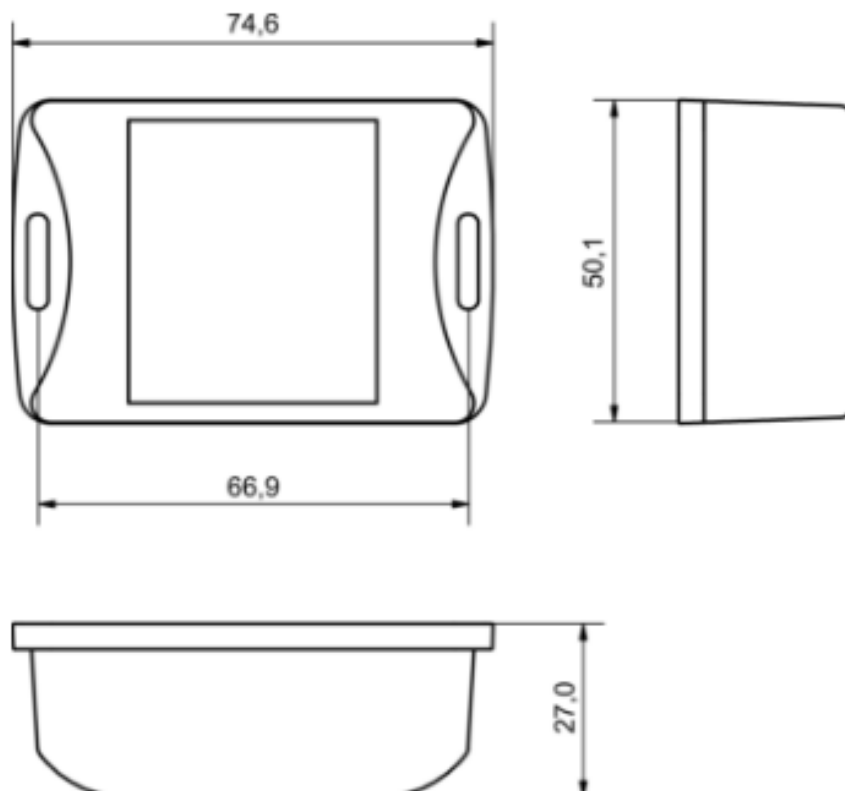
Communication:
>   1 Ethernet port: speed up to 10Mbps
>   PoE power supply compliant with IEEE 802.3af standard

Housing:
>   Enclossure class: IP30

Dimensions:

General features:

The unit is equipped with a 7-segment display. Communication with the module takes place via LAN.

The following communication options are available:
- built-in web server, using a standard web browser (preferred browsers are Firefox, Opera, Google Chrome),
- Windows / Linux command line programmes,
- Modbus TCP protocol,
- SNMP protocol,
- own application via TCP protocol (shared protocol),
- MQTT Inveo protocol.

Description of the module connectors:
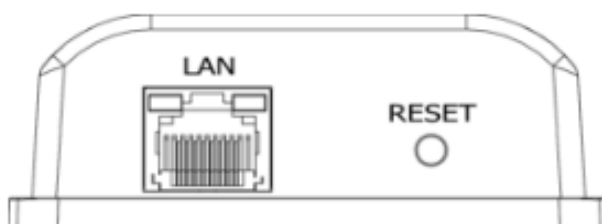
- **LAN** – connection of LAN and PoE IEEE 802.3af power supply,
- **RESET** – button designed to enable DHCP in the module, check the current IP address and restore the module to factory settings.

- **1-WIRE** – disconnect screw connector for temperature sensor connection,
- **POWER** – power connector. Additional power connector used in case of PoE power failure.

5.2 Nano Temp
Technical data:
Power supply:
> The module is designed for a supply voltage of 10-24VDC.
> Power is supplied via a passive PoE adapter.

Inputs:
> 1 input: 1-wire bus
> sensor type: DS18B20
> measured temperature range: -55°C to +125°C
> disconnectable screw connector

Communication:
> 1 Ethernet port: speed up to 10Mbps
> 10-24VDC passive PoE power supply

Housing:
> Enclosure class: IP30

Dimensions:

RESET - button designed to enable in the DHCP module and restore the device to factory settings.

General features:

The module is equipped with LEDs that indicate the power supply of the module and the moment of temperature reading from the sensor.
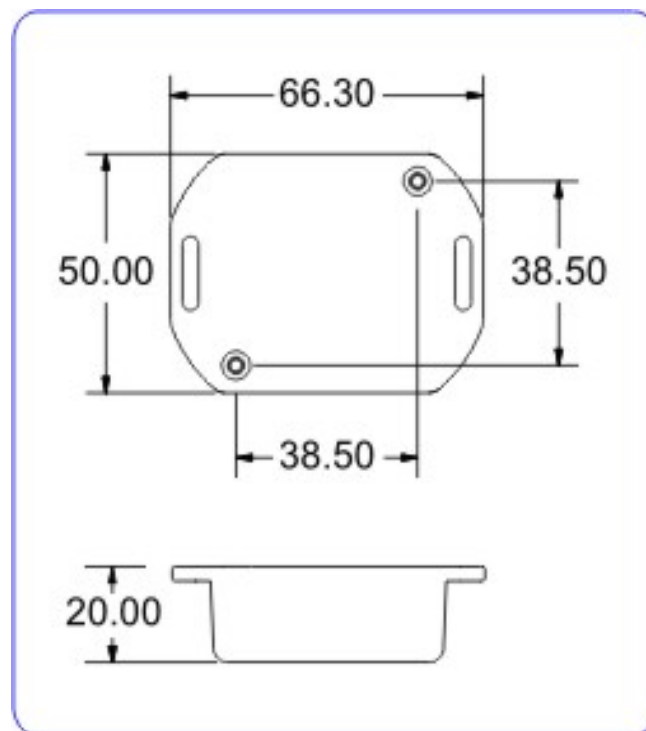
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- built-in web server, using a standard web browser (preferred browsers are Firefox, Opera, Google Chrome),
- Windows / Linux command line programmes,
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- SNMP protocol,
- own application via TCP protocol (shared protocol),
- MQTT Inveo protocol.

**Description of the module connectors:**
- **LAN** - connection of LAN and Passive PoE power supply,
- **RESET** - button for enabling DHCP in the module, checking the current IP address and restoring the module to factory settings,
- **1-WIRE** - disconnectable screw connector for temperature sensor connection.

6 Device configuration

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

6.1 Changing the IP address of the device via Discoverer programme

After launching the Discoverer program (available at www.inveo.com.pl) and searching for a suitable device, right-click and then press Change IP.
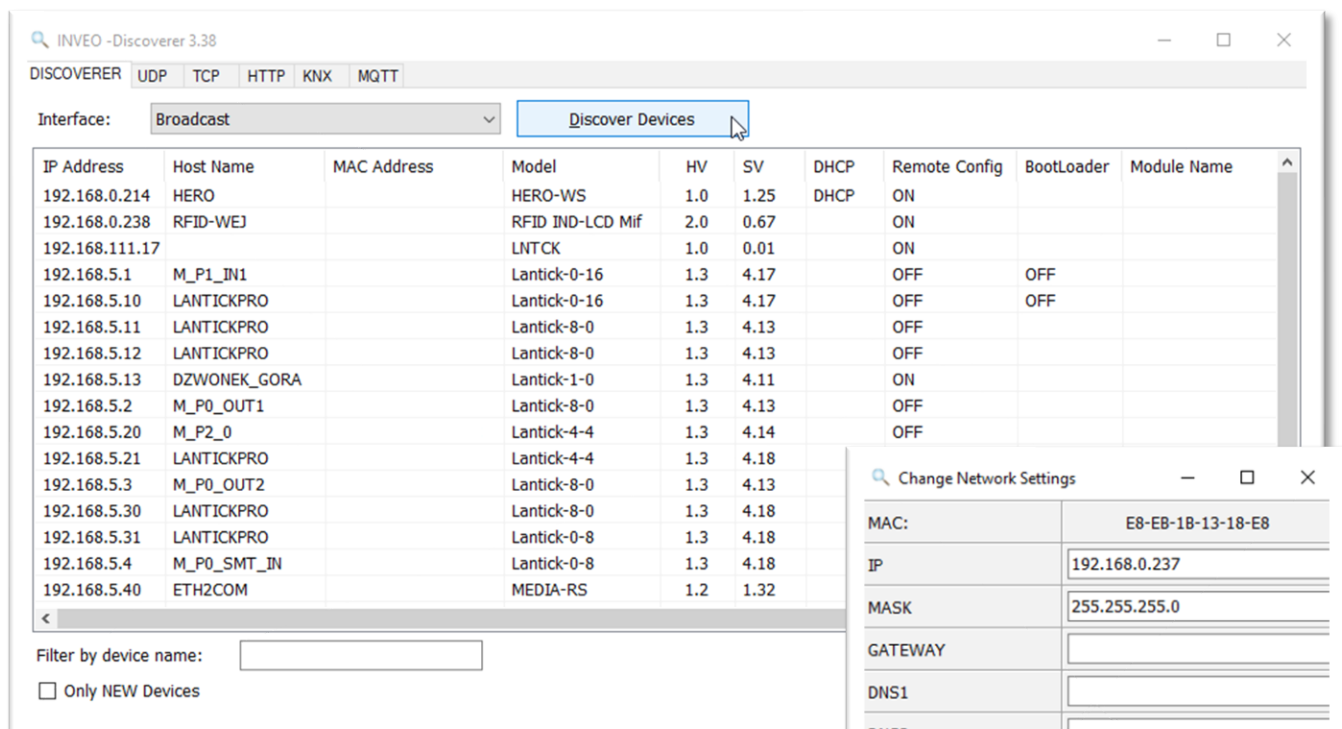
When a dialog box opens, you can set the appropriate IP address, mask, gateway, DNS1/DNS2 and you can also change the Host name.

The device will be configured after click Change.

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

To enable Remote Config, go to the Administration tab, in the Settings window select Enable Remote Network Config.
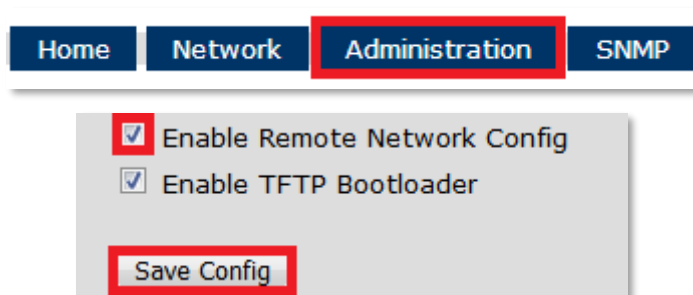
Then click Save to save the settings.

6.2 Changing the subnet of the computer to be configured

When configuring the device bypassing the Discoverer application, you must first change the subnet address of the computer connected to the same network.

To do this, go to the network configuration of the computer:

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

<div align="center">

OR

</div>

- Start → Control panel → Network and Internet → Network centre and Sharing → Change network adapter settings.

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

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	☑	

Once selected, the configuration screen will appear:
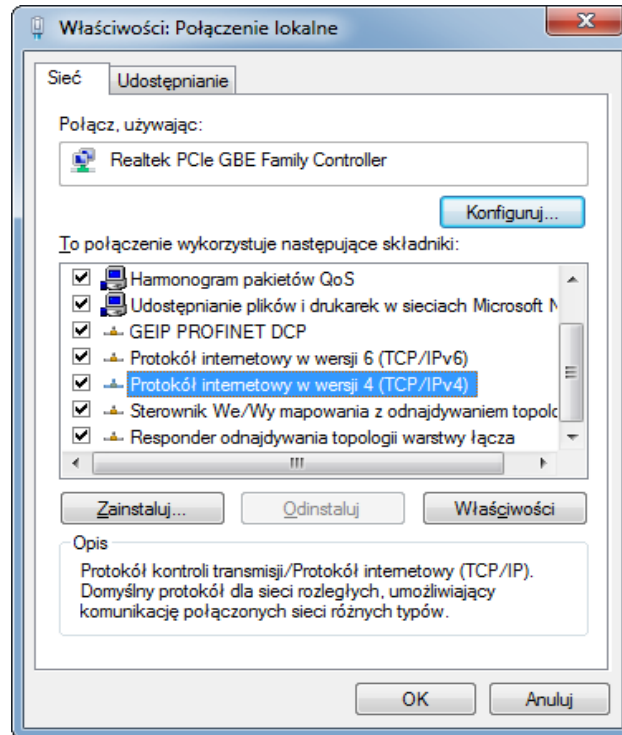
Then select the "Internet Protocol (TCP/IP)" setting and enter the following parameters:
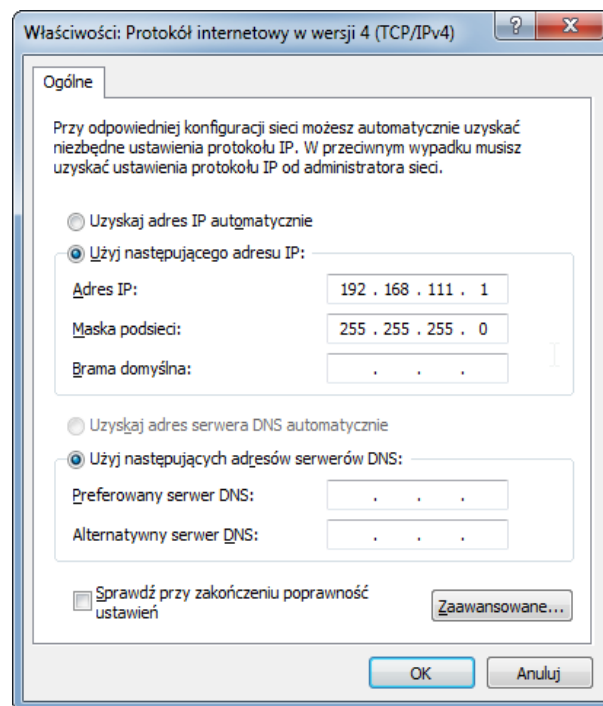
After accepting the settings with the OK button, start your web browser and enter the address: 192.168.111.15. (Default user and password: admin/admin00).

6.3 Configuring LAN and Wi-Fi network settings

In the Network tab it is possible to change the LAN parameters.

Use the fields to change the network settings of the module:
- **Host Name** – the name of the NetBios,
- **DHCP** – enable DHCP client, checking this field forces the use of the address assigned by the DHCP server,
- **IP Address** – module's IP address,
- **Gateway** – network gateway,
- **Subnet Mask** – IP subnet mask,
- **DNS1, DNS2** – addresses of DNS servers.
- **Destination IP** – IP address of the module to which input or output states are to be transmitted in case of M2M communication (chapter 7.3),
- **Destination Port** – the port on which the remote device is listening.

After making changes, click Save Config.

6.4 Ustawienia Security and configuration settings

The Administration menu allows the user to configure which services are to be active on the device and to change the access password.

Changing the password

To change the password, enter the current password in the Current Password field. Enter the new password in the New Password and Re-type Password fields and confirm with Save Config. The password is deactivated by leaving the New Password fields blank.

Setting up services

The device allows you to select which services are to be available. Selecting the check box next to the service name activates the selected service.

- **Enable Program Access** – service for access via software (Windows, Linux) and TCP/IP protocol operating on port 9761,
- **Enable MODBUS TCP Protocol** – enabling MODBUS TCP server,
- **Enable SNMP** - enable SNMP protocol support,
- **Enable Destination Client** - service of transmitting I/O status to another module,
- **Enable MQTT Inveo** – MQTT protocol enabled,
- **Enable Remote Network Config** – enabling remote configuration (Discoverer program),
- **Enable TFTP Bootloader** – enable the bootloader.

★ Warning For security reasons, the TFTP Bootloader and Remote Network Config options should be disabled during normal operation. They should only be enabled before a software update.

7 Module functions

7.1 Viewing the measured temperature

The Home tab displays the current temperature read from the sensor connected to the bus and indicates the over temperature status.
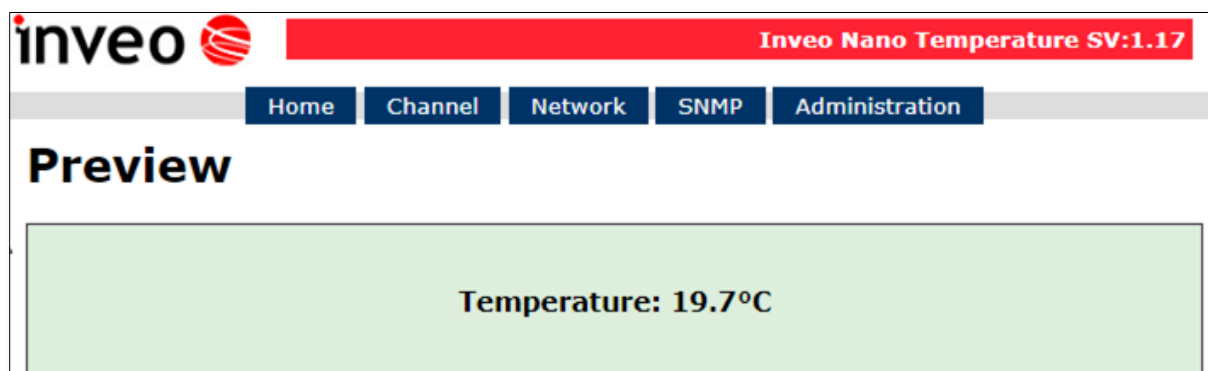
7.2 Alarms

The Channel tab contains settings for temperature thresholds above which an alarm is triggered.
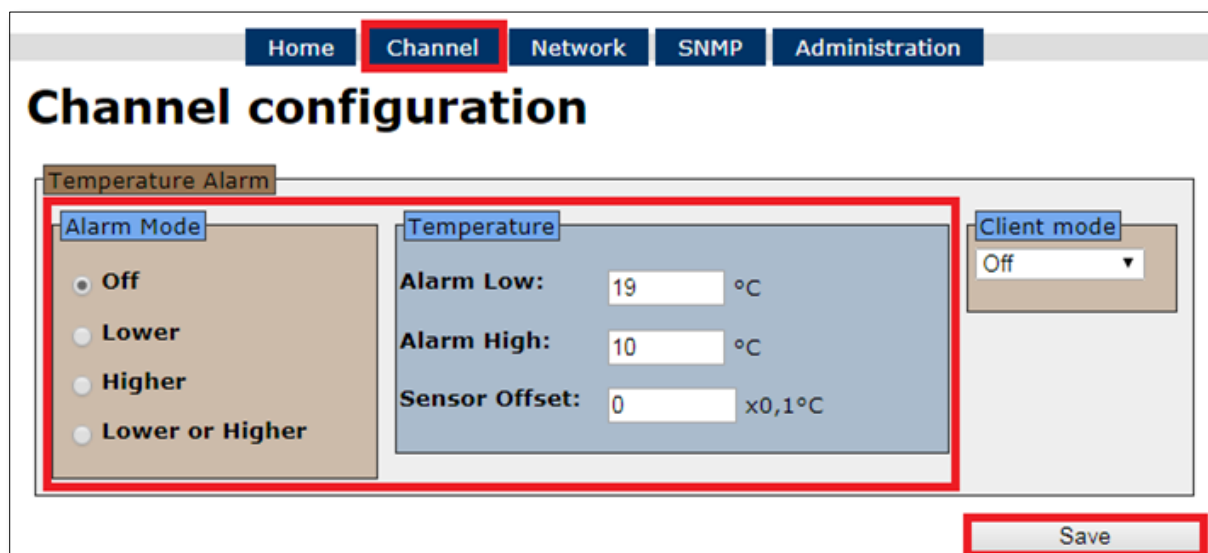
Alarm Mode

- **Off** – alarm disabled,
- **Lower** – active alarm, if the measured temperature is lower than the value set in the field Alarm Low,
- **Higher** – active alarm, if the measured temperature is higher than the value set in the Alarm High field,
- **Lower or Higher** – active alarm, if the measured temperature is higher than the value set in the Alarm High field or lower than the value set in the Alarm Low field.

The Sensor Offset field allows to correct the values measured by the sensor by the set value, if necessary.

Setting the appropriate configuration should be confirmed with the Save button.

The occurrence of an alarm condition is signalled on the module's home page and the LED display or the LED on the device flashes.

Preview

Temperature: 19.9ºC

Alarm activated!

When an alarm condition occurs, virtual output 1 (<on>000001</on>) is activated in the status.xml resource.
http://192.168.111.15/status.xml

```
<response>
    <prod_name>Nano-DS</prod_name>
    <sv>1.17</sv>
    <mac>00:00:00:00:00:00</mac>
    <out>00000000</out>
    <on>00000001</on>
    <in>00000000</in>
    <counter1>0</counter1>
    <temp1>18.8</temp1>
</response>
```

💬 Tip   If an alarm has occurred, transition to normal operation (without alarm signalling) will only occur when the hysteresis zone of 1 degree Celsius is exceeded. For example, if an alarm Lower is set with a value of Alarm Low 20 then the alarm will be activated when the temperature reaches 20 degrees and deactivated when the temperature exceeds 21 degrees Celsius.

7.3 Destination Client (M2M)

Inveo devices such as LanTick, Nano Temperature Sensor, Nano Digital Input, Nano Relay Output or others can send information data to a server or to another module with outputs via TCP or UDP protocol. This means that the remote module can receive the sensor reading values in real time, respond to channel activation, or switch the relay output on/off when a local device alarm occurs. A message is sent with each status change and additionally every 5 seconds.
Configuration for modules receiving messages (target devices):
To attach the service, go to the Administration tab and select Enable Program Access, then confirm with Save Config.
Configuration for modules sending messages (alarm status, output status, etc.):
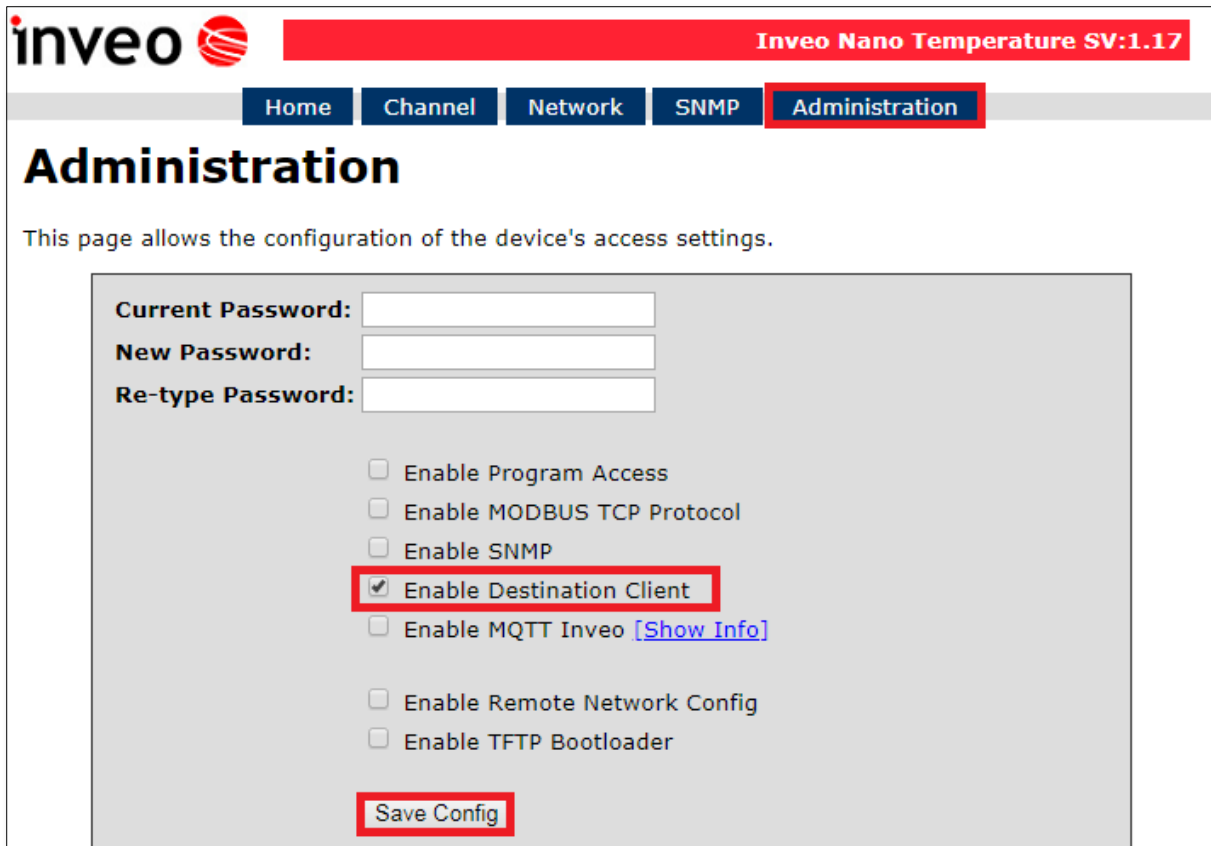
Step 1:

To attach the service, go to the Administration tab
and select Enable Destination Client, then confirm with Save Config.
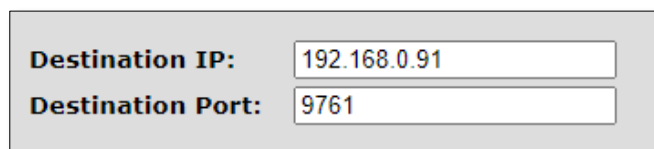

Step 2:

In the Network tab, complete the fields:
- **Destination IP** - the IP address of the destination device or server,
- **Destination Port** - the port number on which the remote device is listening, by default 9761.

Step 3:
In the Channel tab, select the type of message to be sent.
For TCP and UDP, you must also select the channel on the target device that will be driven when an alarm occurs.
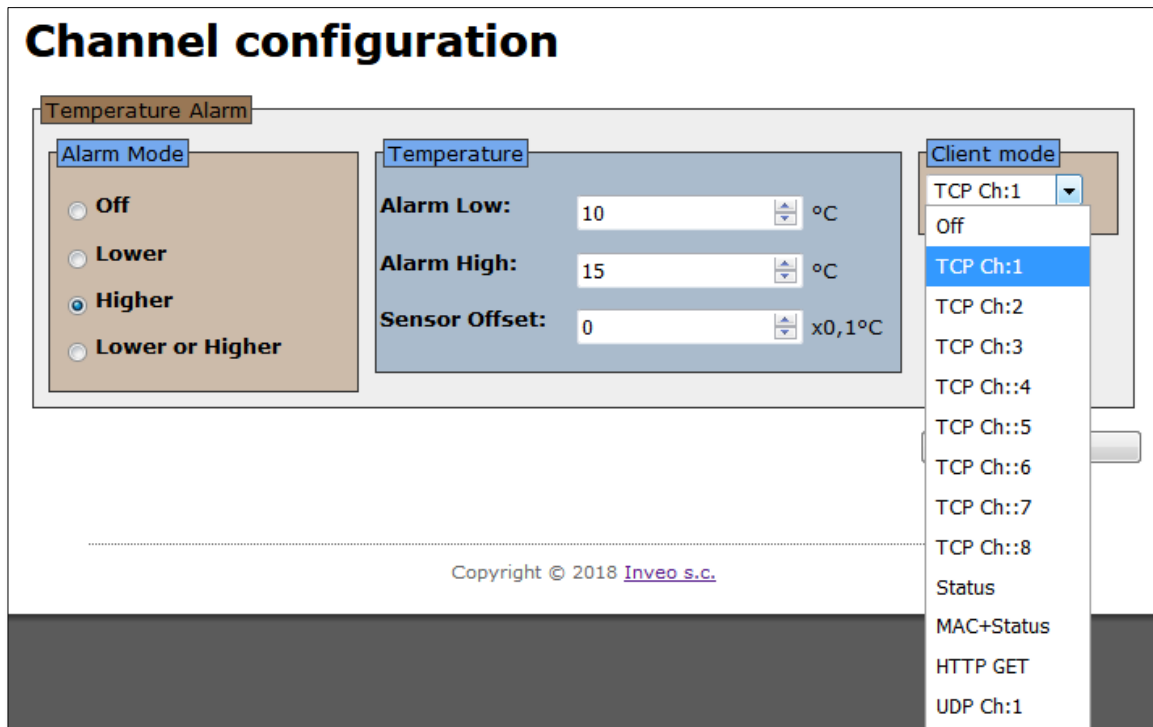
The following fields can be selected:
- • TCP Ch:x
- • UDP Ch:x
- • Status
- • MAC+Status
- • HTTP GET

7.3.1 TCP Ch:x and UDP CH:x

TCP Ch:x – function uses the connection protocol, i.e. TCP protocol. The Ch:x number is the destination output channel on the remote device e.g.: on the LanTick to be driven when the channel state of the local device changes, TCP frame format **#1**.

UDP Ch:x – the function uses the connectionless protocol, i.e.
UDP protocol. The Ch:x number is the destination output channel on the remote device, e.g. on the LanTick, to be driven when the channel state of the local device changes, a UDP frame in format **#1.**

The frame in format #1 is sent in binary form.
Example TCP frame sent when alarm is active and Ch:1 is set

SOF	CMD	CH	F_ID	ALARM	!ALARM	TEMP	RES	RAW MSB	RAW LSB	CRC
0x0F	0x01	**0x00**	0xFF	0x01	0xFE	0x1E	0x00	0x01	0xED	0x1A

Example TCP frame sent with inactive alarm and Ch:1 set

SOF	CMD	CH	F_ID	ALARM	!ALARM	TEMP	RES	RAW MSB	RAW LSB	CRC
0x0F	0x01	**0x00**	0xFF	0x00	0xFF	0x16	0x00	0x01	0x63	0x88

The CH value specifies the selected output channel number on the target device that will be driven when an alarm occurs.
ALARM - a value of 01 indicates an active alarm, 00 indicates an inactive alarm.
The TEMP value is the temperature without the decimal point.
RAW_MSB and RAW_LSB values are the temperature read directly
from the sensor. The temperature read should be divided by 16.
Example: Raw MSB - 01
         Raw LSB - 63
         (hex) 157 = (dec) 355
         355/16=22,19

CRC calculation:

CRC = (SOF+CMD+CH+F_ID+ALARM+!ALARM+TEMP+RES+RAW_LSB+RAW_MSB) MOD 256

Format #1

7.3.2 Status
Selecting this type of message will send the channel status of the device, a TCP frame in format #2.

he frame in format #2 is sent as a string (STRING).

<ALARM>[SPACE]<TEMPERATURE>
- **ALARM** – value 1 means active alarm, 0 means inactive alarm
- **TEMPERATURA** – read temperaturę

Wartość w HEX						STRING
30	20	33	39	2E	35	0 39,5

Format #2

7.3.3 Mac+Status
When this type of message is selected, the module sends the MAC address of the device and the current status of the channel, a TCP frame in the #3 format,

The frame in format #3 is sent as a string of characters (STRING).

<MAC>[SPACE]<ALARM>[SPACE]<TEMPERATURE>

- • **MAC** – network address of the module
- • **ALARM** – value 1 means active alarm, 0 means inactive alarm
- • **TEMPERATURE** – read temperature

Wartość w HEX																		STRING
35	34	31	30	45	43	36	35	35	30	32	31	20	30	20	34	36	2E	39	000000000000 0 46.9

Format #3

7.3.4 HTTP GET

When HTTP GET is selected, the module sends the MAC address of the device, the alarm status and the temperature value, frame format #4.

U By setting Client Mode to HTTP GET, the device sends data to the server in the form:

nano.php?mac=<MAC>&io=<Alarm>&value=<Temperature>
- • **MAC** – the network address of the module,
- • **Alarm** – a value of 1 indicates an alarm condition, 0 indicates an inactive alarm,
- • **Temperatura** – counter status.

Example frame received by the server:
GET /nano.php?mac=123456789012&io=1&value=26.2

MAC address = 123456789012,
io=1,   alarm active
value=26.2,   temperature is 26.2

The TCP frame can be handled by your own software.

☐ Tip   The operation of the data transfer can be tested using Inveo Discoverer: (available at www.inveo.com.pl: pobierz Inveo Discoverer).

To test the data transfer, go to the Administration tab and select Enable Destination Client, then confirm with Save Config.

In the Network tab, complete the fields:
- • **Destination IP** - the IP address of the computer,
- • **Destination Port** - the port number on which the remote device is listening, by default 9761.

To test the type of TCP message being sent, select TCP Ch:x in the Channel tab. The next step is to launch Inveo Discoverer and open the TCP tab. In the IP address and Port windows, enter the same values as in the Network tab.
In the Receive Data pane, select the HEX option. Finally, click on the Listen button.
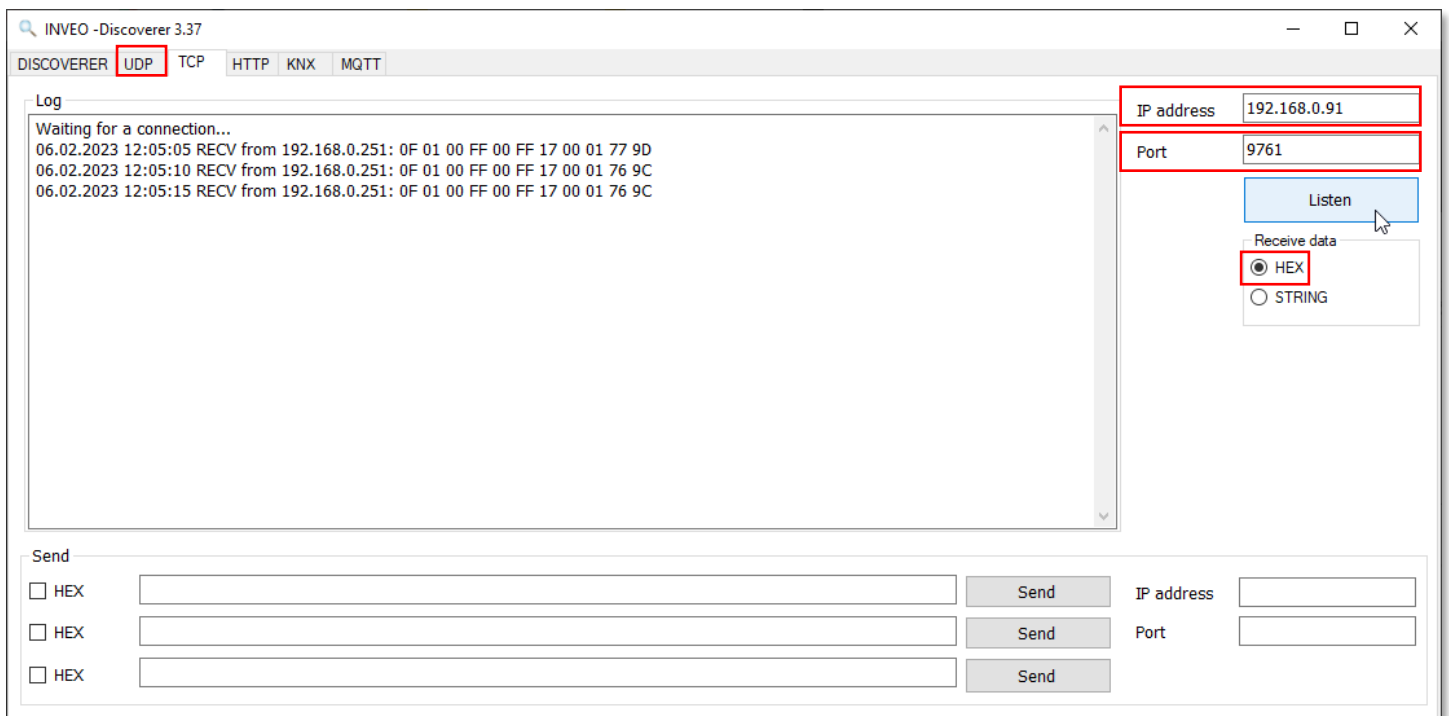
When testing UDP messages, select UDP Ch:x in the Channel tab. Then switch to the UDP tab in Inveo Discoverer. In the IP address and Port boxes, enter the same values as the Network tab.
In the Receive Data box, select the HEX option. Finally, click on the Listen button.
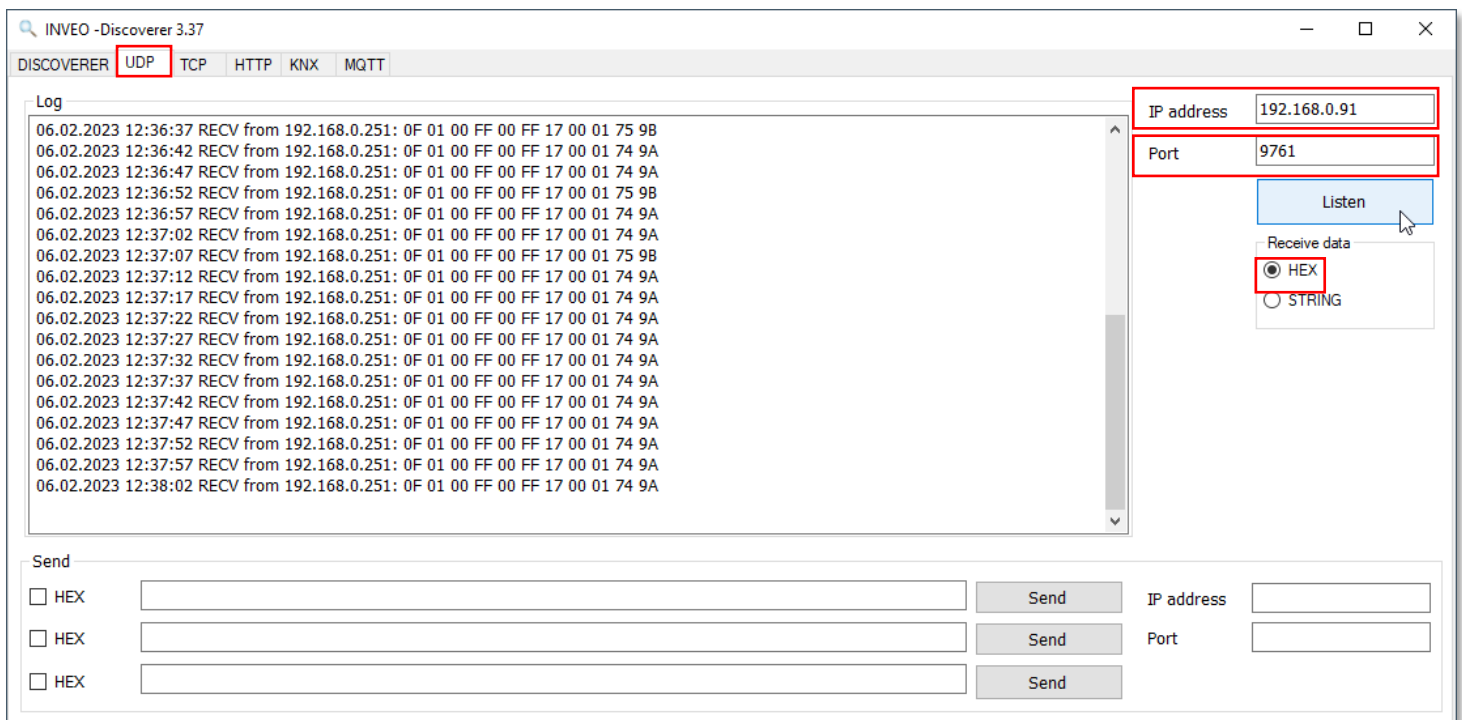
To test the following message types: Status, Mac+status you should select Status or Mac+status respectively in the Channel tab. The next step is to start Inveo Discoverer and go to the TCP tab. In the IP address and Port windows, enter the same values as in the Network tab. In the Receive Data window, select the STRING option. Finally, click on the Listen button.
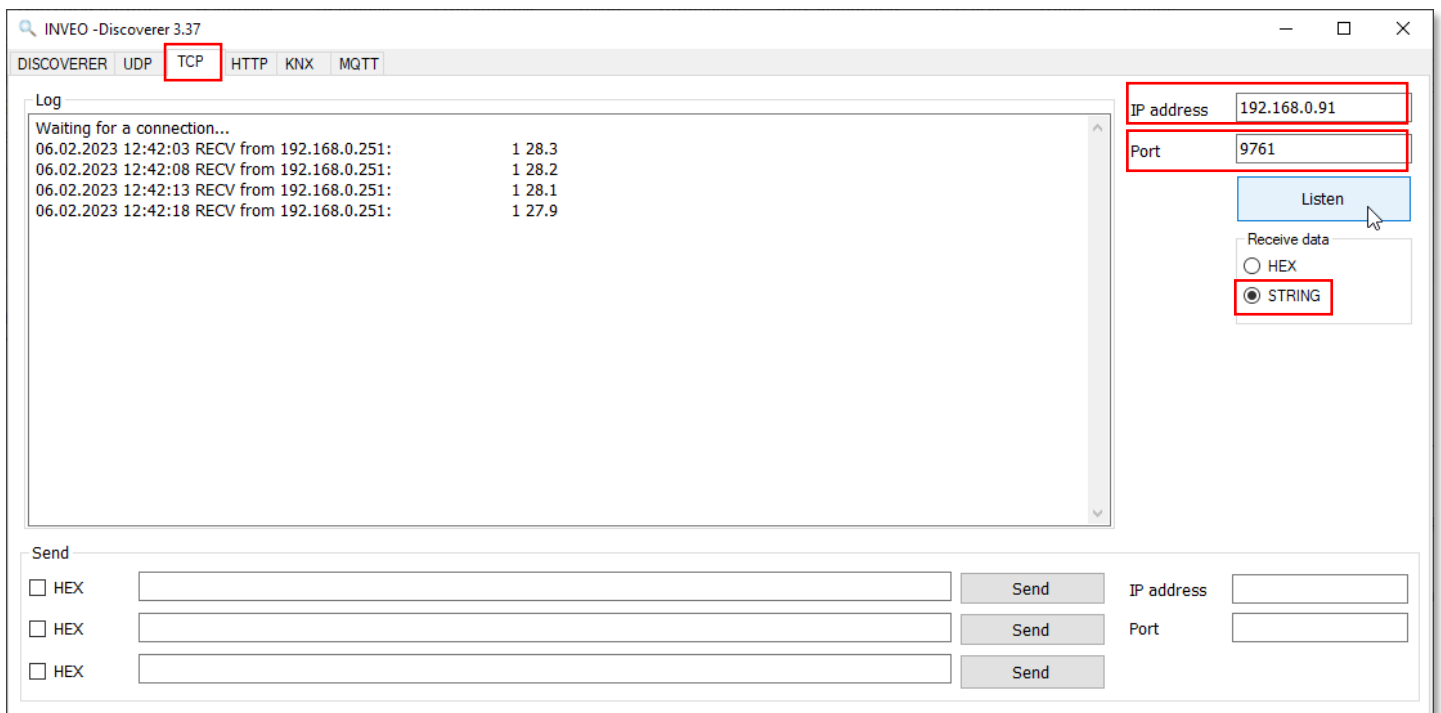
To test the HTTP message type, select HTTP in the Channel tab. Then go to the HTTP tab in Inveo Discoverer. Enter the same values in the IP address and Port boxes as in the Network tab. Finally, click on the Listen button.

7.4 SNMP configuration

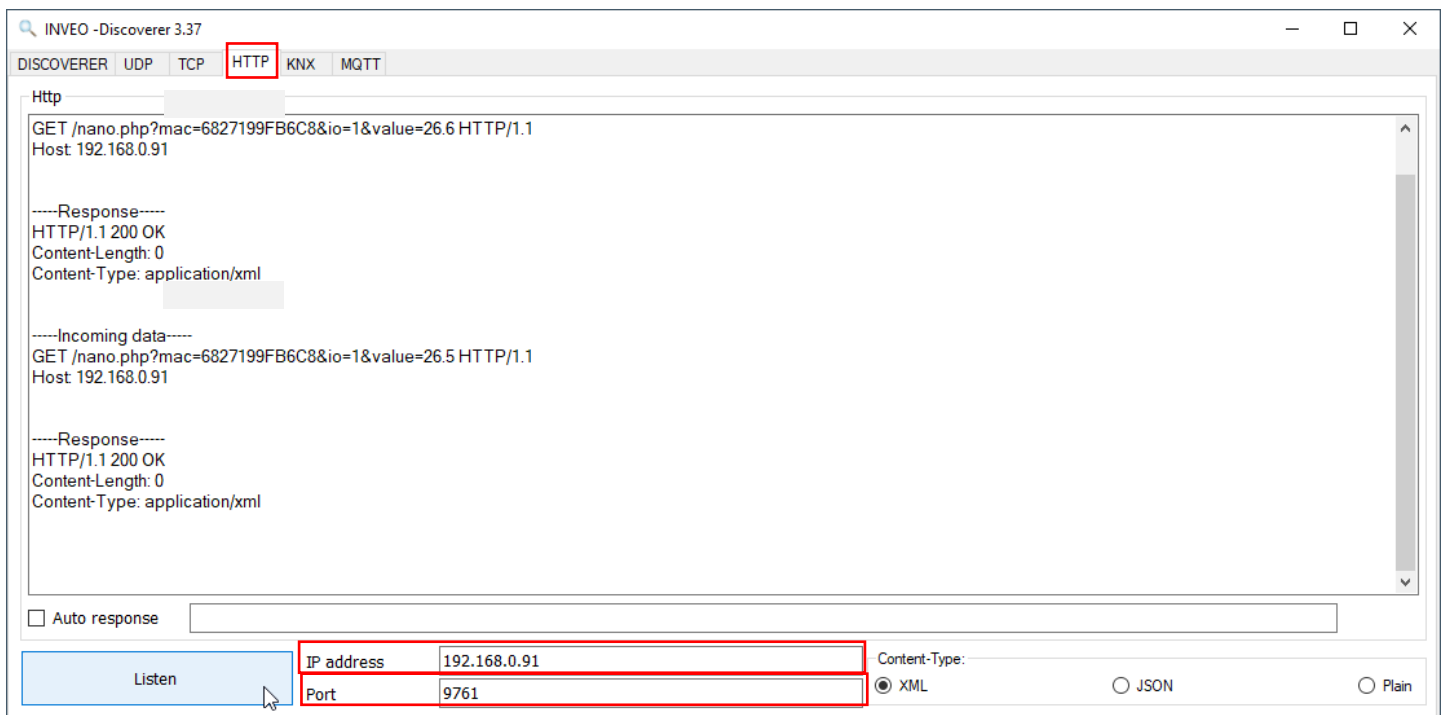The module is equipped with an SNMP v2c server. The function can be activated in the Administration tab, option Enable SNMP. The SNMP protocol makes it possible to read the current temperature. The MIB file describing the structure is downloadable from the SNMP tab.

 The basic parameters that can be read from the Nano

Temperature Sensor are listed in the table:

Name	Format	OID
Temperature	STRING	.1.3.6.1.4.1.42814.14.3.5.1.0
Temperature (integer part)	INTEGER	.1.3.6.1.4.1.42814.14.3.5.2.0
Temperature x10	INTEGER	.1.3.6.1.4.1.42814.14.3.5.3.0
Alarm active	INTEGER	.1.3.6.1.4.1.42814.14.3.1.1.0

The module allows TRAP messages to be sent when the temperature is exceeded. The target address is entered in the fields Trap IP Address 1 and Trap IP Address 2.

7.5 Windows command line control program

For command line control, the cURL program can be used. First enable the Program Access service in the Administration tab.

Example:
Reading the current temperature, the module has the address 192.168.0.231:
To read the measured temperature, simply refer to the resource temp1.txt e.g.:
http://192.168.0.231/temp1.txt, then the temperature will be displayed in text form:

```
curl http://192.168.0.231/temp1.txt
```

Access to the stat.php resource requires authorisation. In such a situation, we precede the command with "-u login:password".

```
curl –u admin:admin00 http://192.168.0.231/stat.php
```

In response, the device will send the following information:

```
<response>
<prod_name>Nano-DS</prod_name>
<sv>1.34</sv>
<mac>00:00:00:00:00:00</mac>
<out>00000000</out>
<on>00000000</on>
<in>00000000</in>
<counter1>0</counter1>
<temp1>21.8</temp1>
</response>
```

Section	Description
<prod_name>PE-DS</prod_name>	Module type
<sv>1.34</sv>	Software version
<mac>00:00:00:00:00:00</mac>	Module network address
<out>00000000</out>	Output mode (On/Off) in Nano Temperature Sensor - not used
<on>00000000</on>	Output status (switched on/off) in Nano Temperature Sensor: **00000001 indicates the occurrence of an alarm**
<in>00000000</in>	In Nano Temperature Sensor always 0
<counter1>0</counter1>	In Nano Temperature Sensor module always 0
<temp1>21.8</temp1>	Measured temperature
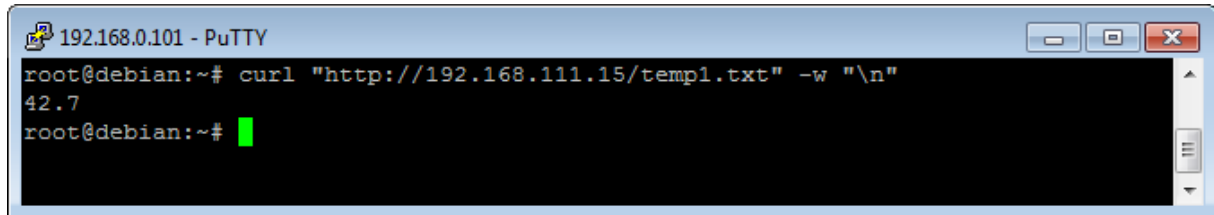
7.6 Linux control program

The cURL programme can be used in the Linux programme:
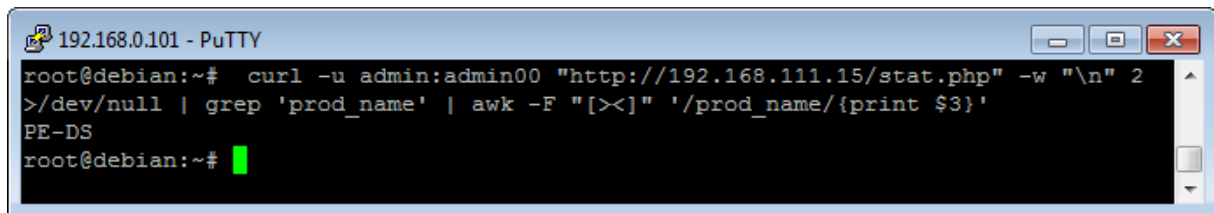
> 💬 Tip   Access to the resource stat.php requires authorisation to be entered.
>   Access to the resources status.xml and temp1.txt does not require authorisation.

```
curl "http://192.168.111.15/temp1.txt" -w "\n"
```
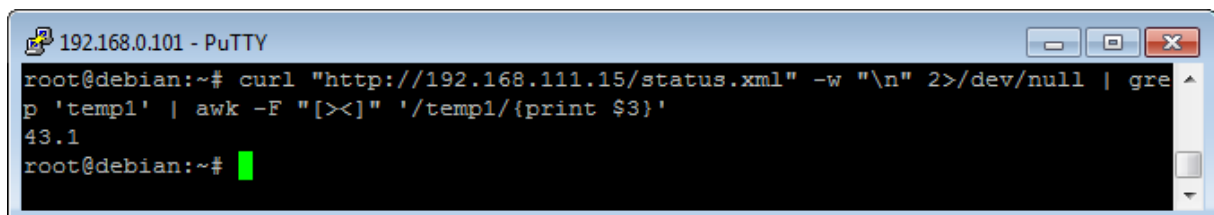
```
192.168.0.101 - PuTTY
root@debian:~# curl "http://192.168.111.15/temp1.txt" -w "\n"
42.7
root@debian:~#
```

```
curl -u admin:admin00 "http://192.168.111.15/stat.php" -w "\n" 2>/dev/null
| grep 'prod_name' | awk -F "[><]" '/prod_name/{print $3}'
```

```
192.168.0.101 - PuTTY
root@debian:~#  curl -u admin:admin00 "http://192.168.111.15/stat.php" -w "\n" 2
>/dev/null | grep 'prod_name' | awk -F "[><]" '/prod_name/{print $3}'
PE-DS
root@debian:~#
```

```
curl "http://192.168.111.15/status.xml" -w "\n" 2>/dev/null | grep 'temp1' |
awk -F "[><]" '/temp1/{print $3}'
```

```
192.168.0.101 - PuTTY
root@debian:~# curl "http://192.168.111.15/status.xml" -w "\n" 2>/dev/null | gre
p 'temp1' | awk -F "[><]" '/temp1/{print $3}'
43.1
root@debian:~#
```

7.7 Modbus TCP

In order to activate the data transmission function via the Modbus TCP protocol, the Enable MODBUS TCP Protocol option must be selected on the Administration tab**.**

Modbus is available via the LAN interface. The Modbus TCP protocol listens on port 502.
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.

Modbus TCP – Coils

Address	Name	R/W	Description
1000	On1	R	Over temperature
1002	SensError	R	Sensor fault (0-ok, 1-fault)

Modbus TCP – Holding Registers

Address	Name	R/W	Description
4000	ThermostatL	R/W	Lower alarm threshold
4001	ThermostatH	R/W	Upper alarm threshold
4002	Alarm mode	R/W	1 – OFF (disabled) 2 – Lower (alarm low) 3 – Higher (alarm high) 4 – Lower or Higher
4004	Temperature x10	R	Temperature x 10 (e.g. 10.5 deg.C to 105)
4005	Temperature Int	R	Integer part of temperature
4006	Temperature Frac	R	Decimal part of temperature
4007	MAC 0	R	MAC address
4008	MAC 1	R	MAC address
4009	MAC 2	R	MAC address
4010	MAC 3	R	MAC address
4011	MAC 4	R	MAC address
4012	MAC 5	R	MAC address
4013	StoreConfig	W	Writing 144 causes the configuration to be rewritten to the EEPROM

7.8 MQTT

The device supports the MQTT protocol. Data from the device is sent to the server every 1 minute and additionally every time a value changes. The data is not encrypted. Once connected to the broker, the user subscribes to data from the device. The number of users receiving data from one device is unlimited.

> **Tip** The user can use the MQTT broker provided by Inveo
> MQTT broker, for which the configuration is as follows:
> - address: mqtt.inveo.com.pl,
> - port: 1883,
> - username: nano,
> - user password: DeV876,
> - topic: /nanoT/<MAC>.

In the Administration tab for the Enable MQTT Inveo setting, clicking [Show Info] will display the settings for the MQTT client that will be needed when the application is launched:

MQTT Client Configuration:

- Server: mqtt.inveo.com.pl
- Port: 1883
- Username: nano
- Password: DeV876
- Topic: /nanoT/6827199
- Alarm Topic: /nanoT/68271   /a

Configuration

First enable MQTT support in the Administration tab - check Enable MQTT Inveo. In the Network tab, you can configure the address and port of the MQTT broker:

MQTT Address:	192.168.0.90
MQTT Port:	1883
	Save Config

> **Tip** If using the Inveo server, these values will be as follows:
> - MQTT Address: mqtt.inveo.com.pl
> - MQTT Port: 1883

Many Android/IOS applications support the MQTT protocol, so you can receive data on your phone (e.g.: MQTT dash app) and on your PC (e.g.: MQTT explorer app).

7.9 Control via HTTP protocol

The modules can be controlled via the HTTP GET protocol.
In order to read the current status of the module, you can refer to a resource in your browser, e.g. http://192.168.111.15/status.xml.

The module will list all relevant information in an XML file:

```
<response>
<prod_name>Nano-DS</prod_name>
<sv>1.20</sv>
<mac>00:00:00:00:00:00</mac>
<out>00000000</out>
<on>00000000</on>
<in>00000000</in>
<counter1>0</counter1>
<temp1>19.4</temp1>
</response>
```

Section	Description
<prod_name>PE-DS</prod_name>	Module type
<sv>1.20</sv>	Software version
<mac>00:00:00:00:00:00</mac>	Module network address
<out>00000000</out>	Output mode (On/Off) in Nano Temperature Sensor - not used
<on>00000000</on>	Output status (switched on/off) in Nano Temperature Sensor: **00000001 indicates the occurrence of an alarm**
<in>00000000</in>	In Nano Temperature Sensor always 0
<counter1>0</counter1>	In Nano Temperature Sensor always 00
<temp1>21.3</temp1>	Measured temperature

To only read the measured temperature, refer to the resource temp1.txt e.g.:
http://192.168.111.17/temp1.txt, then the temperature will be displayed in text form.

7.10   TCP communication protocol description

Nano Temperature Sensor communication data frame.

Comma nd name	Byte number	1	2	3	4	5	6	7	8	9	10	11	
	Byte name	SOF	CMD	Chan nel	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	CRC	Retur ns
Read tempera ture	dec	15	12	0	0	0	0	0	0	0	0	CRC	2byt es + CRC
	hex	0x0F	0x0C	0x00	0	0	0	0	0	0	0	CRC	2byt es + CRC

The module listens on TCP port 9761 by default.

Reading the current value from the temperature sensor.

SOF	CMD	CH	D1	D2	D3	D4	D5	D6	D7	CRC
0x0F	0x0C	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x1B

CRC = (BYTE) SUMA (SOF+CMD+CH+D1..D7)
The command will return 2 bytes (current temperature) + CRC (sum of previous 2 bytes)

Examples:

Temperature value measured by sensor	Value returned by the module on port 9761		Conversion to dec format		Temperature value converted (dec/16)
dec	2 bytes	CRC	hex	dec	dec
-18,0	EO FE	DE	FFFF-FEE0	287	-17,9375
-5,1	AE FF	AD	FFF-FFAE	81	-5,0625
26,5	A8 01	A9	1A8	424	26,5
33,8	1E 02	20	21E	542	33,875

The converted decimal value should be divided by 16.

8 Communication with the module from an external network

If the module is on a different LAN from the computer connecting to it, port forwarding is required.
Depending on the method of communication with the module used, it is necessary to contact the Network Administrator and redirect the ports:

Support via WWW and HTTP protocol:
- TCP port 80

Operation via software or via your own application:
- TCP port 9761

Operation via MODBUS TCP:
- TCP port 502

Support via SNMP:
- UDP port 161

9 IP address verification

Applies only to the Nano Temperature Sensor PoE.
To check the current IP address of the device:
1. press and hold the RESET button until all 4 parts of the IP address are displayed, e.g.: 192 168 111 15.
2. Release the RESET button.

10 DHCP

1. press the **RESET** button for between 5 and 10 seconds.
2. the LED will blink approximately 2 times per second (Nano Temperature Sensor), the display will show dhcP (Nano Temperature Sensor PoE).
Release the **RESET** button.

It is also possible to enable DHCP in the network configuration on the **Network** tab
or via the Discoverer program (available at www.inveo.com.pl: download Inveo Discoverer).

11 Restoring the factory settings

To restore the factory settings of the device, please:

1. Switch on the device.
2. Press the **RESET** button for between 10 and 15 seconds.
3. The LED will blink approximately 4 times per second (Nano Temperature Sensor), the display will show rSt (Nano Temperature Sensor PoE).
4. Release the **RESET** button.

After performing the above steps, the device will set the following parameters:
- IP address: 192.168.111.15
- IP mask: 255.255.255.0
- User: admin
- Password: admin00

12 Software update

The module is equipped with a programme update facility. The program is supplied as a file with the extension '.bin'.

★ Warning   Improper use of the software update function may damage the module.

In order to carry out the software update operation, it is necessary to:
- check the Enable TFTP Bootloader option, which can be found on the device page under Administration,
- run the Windows command line (Start->Run, type 'cmd' and confirm by pressing Enter),
- go to the directory where the.bin file is located,
- enter the command:
tftp -i <address_ip_module> PUT file.bin

where: <address_ip_module> is the IP address of the module,
file.bin is the file with the update program.

Programming takes approximately 2 minutes. Completion of programming is confirmed by the 'File Transferred' message.

After the software update operation, it is necessary to disable the Enable TFTP Bootloader option for correct operation of the device.

$$\mathsf{C}\,\mathsf{E}$$

EC DECLARATION OF CONFORMITY

Manufacturer   Inveo spółka z o.o.
Rzemieślnicza 21
43-340 Kozy

Product   **Nano Temperature Sensor PoE, Nano Temp**

The product is compliance with the requirements of the following European directives:

2014/53/EU   Radio Equipment

2014/30/EU   Electromagnetic Compatibility

2011/65/EU   Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS II)

The compliance with the requirements of the European Directive was proved by the application of the following harmonized standards:

Safety: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013,

EMC: EN 55032:2010 Class A
EN 55024:2010

RoHS II   EN 50581:2012

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament ad of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

mgr inż. Sławomir Darmofał

inveo

mgr inż. Sławomir Darmofał

Kozy, 19.12.2022 r.