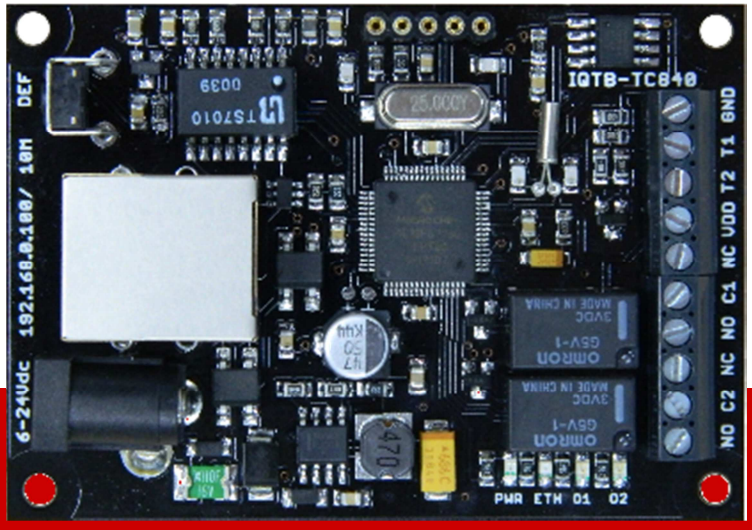
Intelligent power sockets

IQsocket IQTB-TC840

...makes your life more comfortable



User guide

Double IP thermometer/thermostat, hygrometer/hygrostat with datalogger and scheduler based on user's condition.

IQTB-TC840

for FW 1.0.3

Important notification

This product is not supposed to be used for medical application.

The product has to be installed within a suitable covering providing the protection against short circuits and contacts with other conductive parts of the set.

It is designed for indoor installations. When installing outdoors, use mounting casing with appropriate coverage.

The product contains no repairable parts and is factory-tested for full functionality.

Do not repair a damaged product by yourself and send it to the manufacturer's diagnostics.

Improper wiring and short-circuits on board connections may lead to permanent damage of the product, which is not covered by the manufacturer's warranty.

This product must be installed by a qualified person. Its installation must be performed in accordance with relevant regulations for installation place.

The manufacturer reserves the right to modify this manual or the firmware without notification.

Manufacturer of this device assumes no responsibility for any damage, injury, loss or expenses incurred due to errors or omissions in any information of the manual.

1 Product description

IQTB-TC840 IQTRONIC IP SMART BOARD is a double IP LAN thermometer/thermostat or hygrometer / hygrostat. It is a device for automatic monitoring function of the temperature / humidity / pressure, with the possibility of watching their limits, including the data storage in the internal memory up to one year, including visualization using a graph and its setting. All values can be read via SNMP protocol v.1.0. It Displays and archives also the extreme values with a time stamp of creation / registration.

The product is equipped with one Ethernet interface with the management via HTTP and:

1. Two output relays with changeover contacts of 1A / 30VDC - resistive load. It also includes a controller for inductive load.
2. Two universal inputs for connecting temperature and humidity-pressure sensors with possibility of standard DS18B20 with a range of -55 to 125 degrees C.
3. Integrated temperature sensor on a board of the device
4. LED indicators for displaying output states.
5. **Passive POE RJ45 with wide-range power supply from 6 to 36V DC +- 20%.**
6. **Very low power consumption of 1W**
7. Possibility of instalation on a DIN rail using DIN adapter.

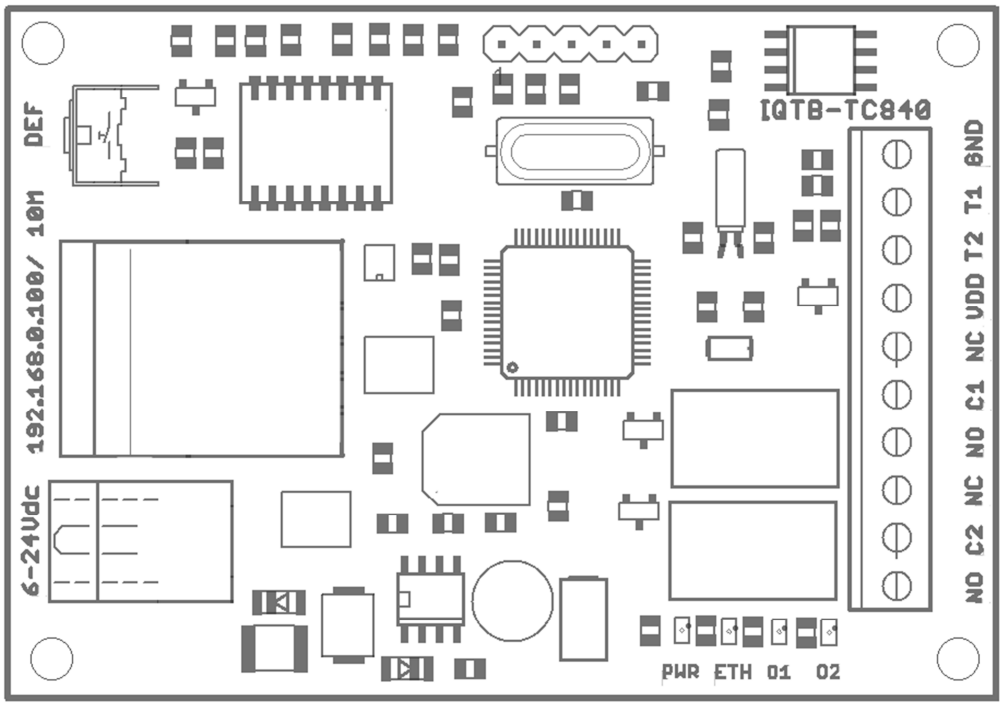
The values visualisation is real-time, thus it is possible to monitor the current values in real time.

1.1 Possible use of the device IQTB-TC840

- Any monitoring of temperature, humidity both relative and absolute, also the dew point and pressure - depending on the external sensor, i.e. as a IP LAN thermostat, hygrostat.
- Monitoring sensor values and storing them. And also displaying to / from the data logger with the possibility of data reading using SNMP.
- Manual control of two outputs.
- Automatic control of the outputs - by programmable scheduler with up to 30 variable records, by exceeding / dropping below the limits , by their difference - differential control or equithermal table - equithermal control.
- Manual control of outputs directly from the main menu, by pressing I using SNMP.

2 Installation

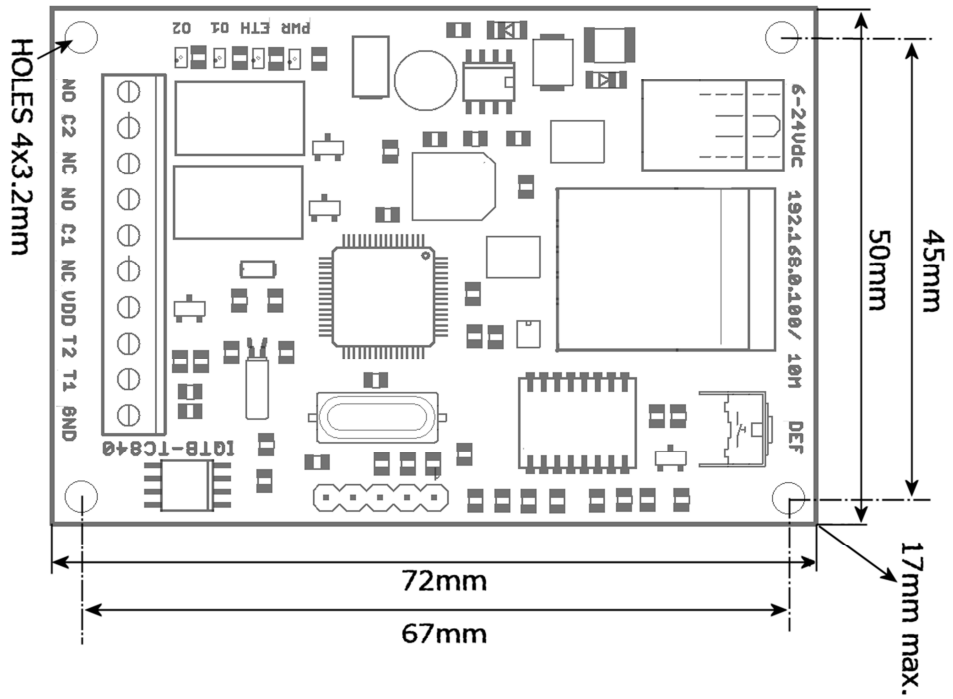
2.1 Description of the device board, inputs and outputs



DEF	This button is for ouputs control – a short press. Or for the factory default settings.
10M Eth	Ethernet RJ-45 jack. Passive PoE support (incompatible with 802.3af, 6-36VDC ± 20%).
6-24VDC	Power connector, recommended voltage is 12VDC ± 20%.
O1,O2	Yellow LED – outputs status.
PWR	Red LED, blinks at intervals of 1 sec – regular operation.
ETH	Green LED, sby shining indicates connection to Ethernet. By dimming indicates its activity.
GND	0VDC potential for sensors (yellow wire, yellow pin pin)
T1,T2	Sensor input for temperature sensor (white wire, green pin)
VDD	Power supply for sensors (green wire, green pin pin)
NC,C1,NO	Output 1 - relay contacts - switchable, 1A/30VDC max.
NC,C2,NO	Output 2 - relay contacts - switchable, 1A/30VDC max.

Note: Improper wiring and short-circuits on board connections may lead to permanent damage of the product, which is not covered by the manufacturer's warranty

2.2 Installation dimensions.

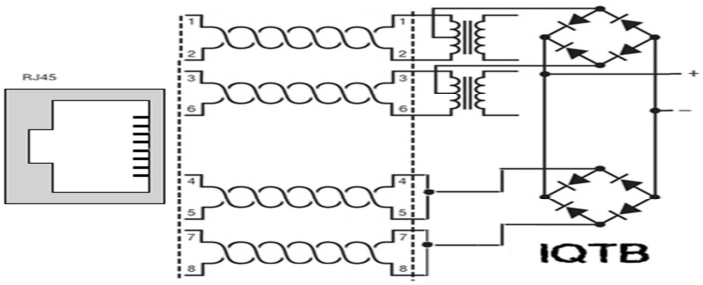


2.3 Power supply of the IQTB-TC840

The device can be powered from a wide power supply from 6V to 36VDC thus with a sufficient tolerance for running on battery power. But must not exceed 40VDC. It's also possible to power it via a passive POE directly from the Ethernet connector.

Recomendation: The recommended power supply is 12Vdc ±20%. This device has not compatible power input with 48V IEEE 802.3af PoE, it can be used with passive POE only!

The power scheme using the passive POE device

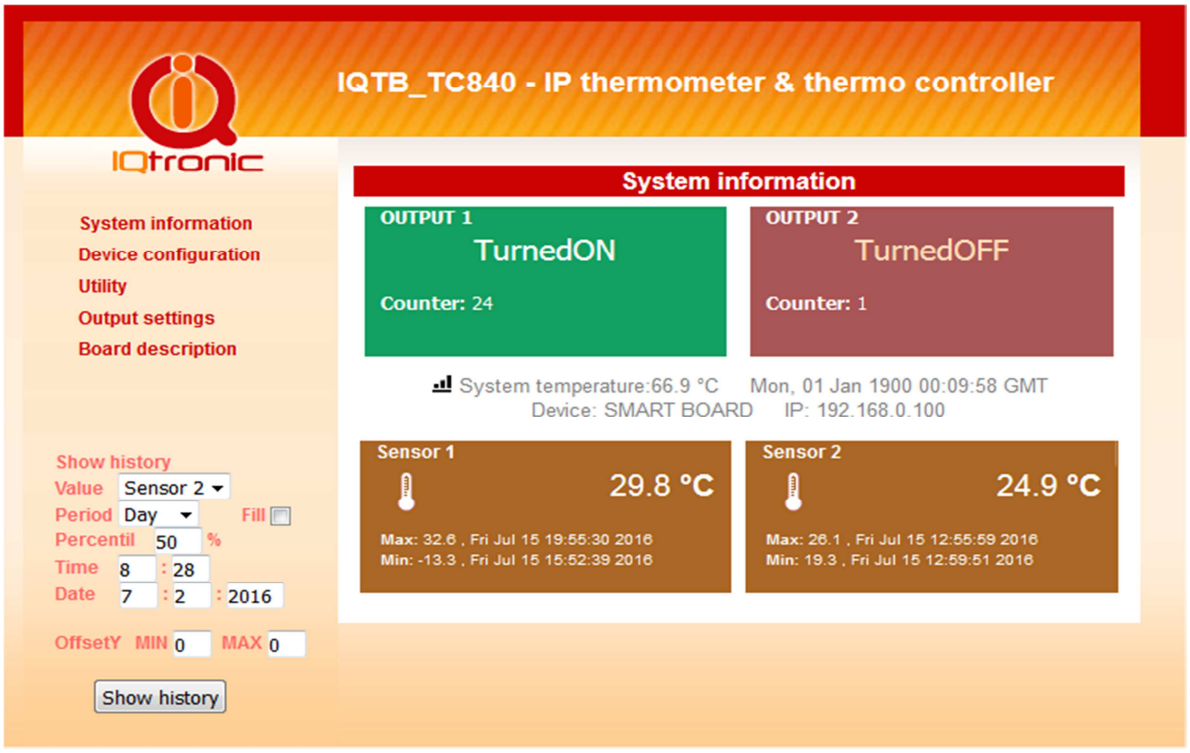


After connecting to voltage will blink all LEDs, PWR will be blinking regularly. The device is now ready to use.

3 Device configuration

- Connect the connecting cable to the computer via an RJ45 connector to the device.
- Set up the following on a PC network card, to which the device is connected: 192.168.0.11, mask 255.255.255.0
-Optionally run IQlocator.exe application that locates the device and it is possible to change the address directly in the device, see. Chapter 9.
- The default IP address of the device is 192.168.0.100.
- Start the Web browser with a default ip:
- In case of using an alias NetBIOS name - IQTB-TC840

3.1 Displaying current values.

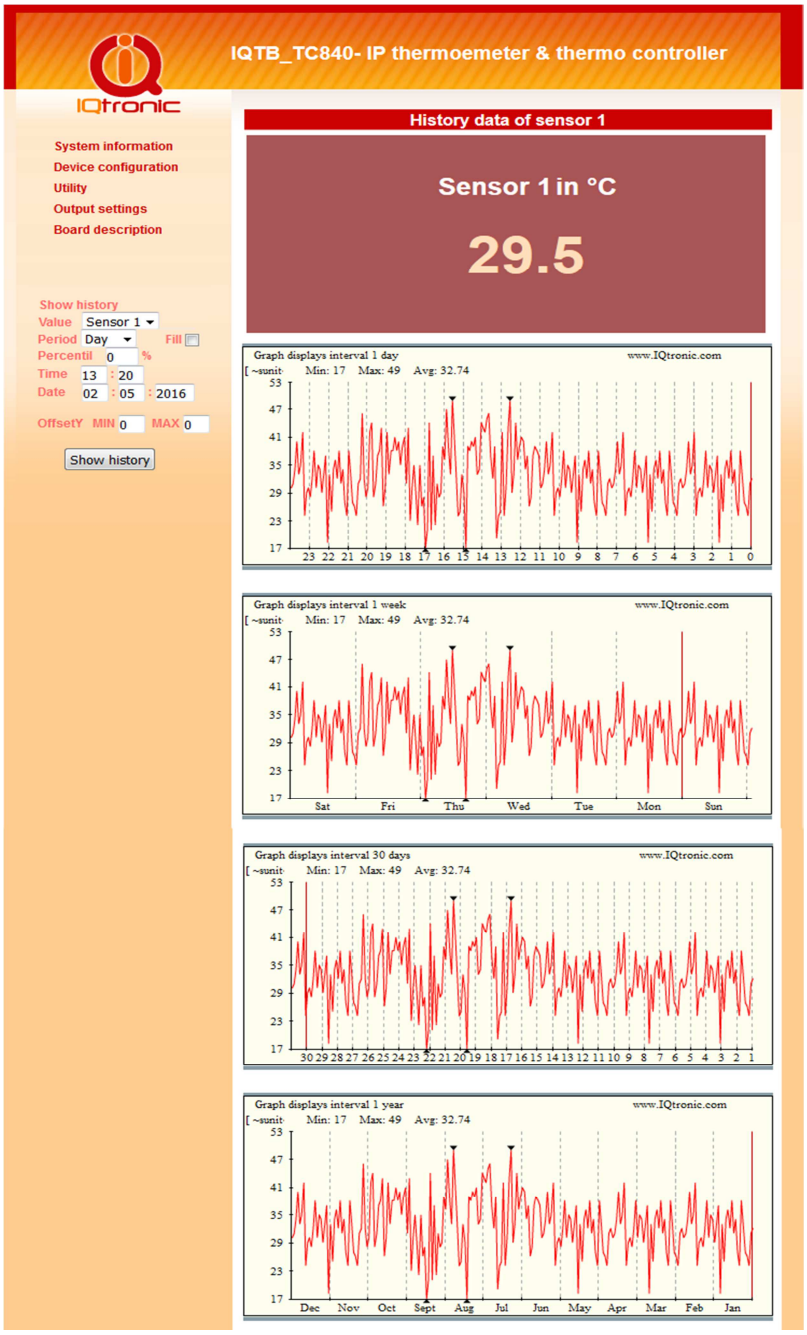


The page will display all data; the current state of the outputs; both of temperature sensors; device temperature; their extreme values; current time obtained from the NTP; status of change counters of outputs. All these values can be read using SNMP protocol version 1.0 or possibly adjust the output relay. It is also possible to set sending TRAP packet in case of exceeding one or more of the conditions.

Values can be read and reset via SNMP. You can also read the stored values from the data logger.

Note: All values is shown with period 500ms. The refresh of main page is not required. Press output rectangle area for change relay outputs.

Clicking on rectangles of output statuses - red/green color indicates the status of outputs - on / off, it is possible to change this state to the opposite. With each change, the counter will increase by one.
By clicking on the inputs rectangle we display the temperature history - there have values in the graph the same course and they only serves as an example of data presentation.

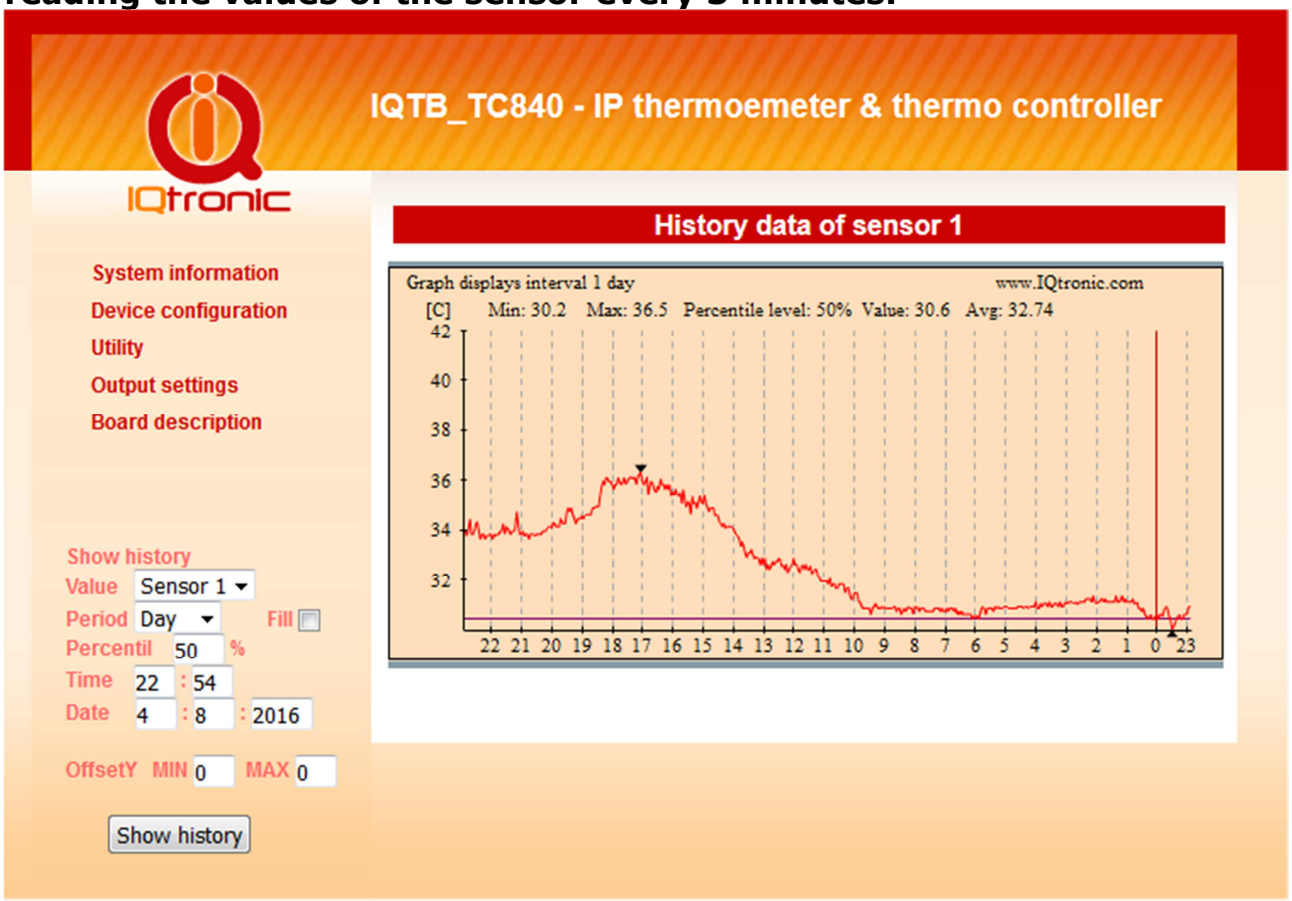


The graphs have daily, weekly, monthly and yearly interval.

To proper display the graph, you must have Flash player installed, which is not, for safety reasons, standardly enabled in your browser.

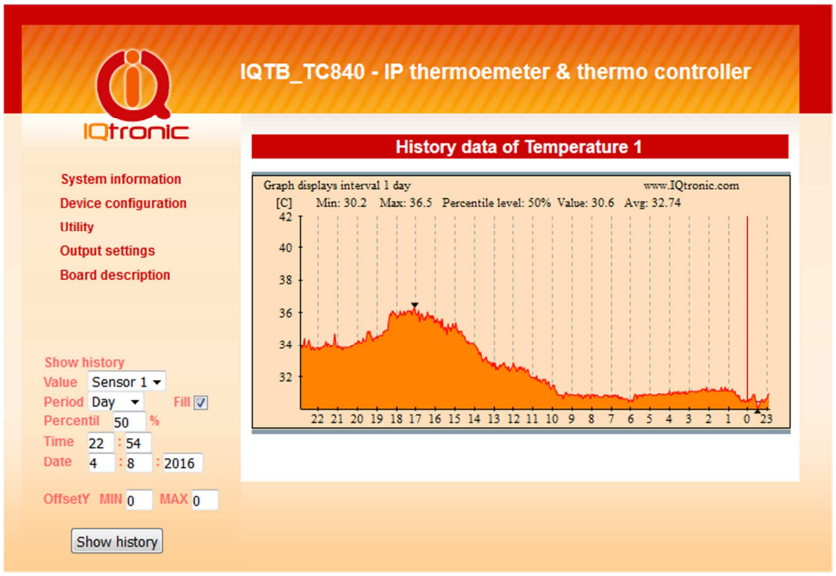
If we want to have a detailed overview of the history, use the data filter on the bottom left.

Where you can adjust everything you need to display data, their classification, or obtaining of statistical variables. VIn the graph, there are also minimum and maximum values marked by a black triangle. Visualization of data larger interval, such as the season has resulted in a smaller display selection of values without averaging. **The most accurate representation offers daily interval, in which is shown in the graph, each value that is obtained by reading the values of the sensor every 3 minutes.**



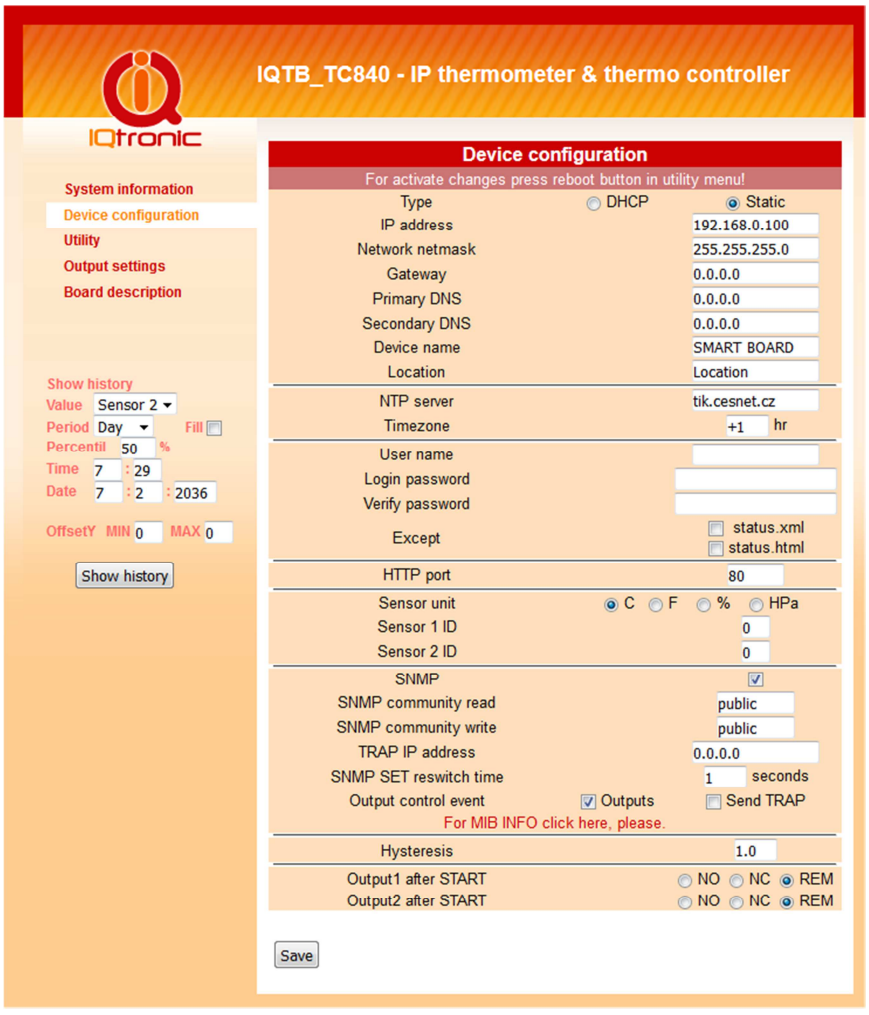
Note: Correct NTP settings is required for normal functionality of datalogger. All datalogger datas is possible to read from history by SNMP also.

Checkbox **FILL** will display a graph with fillings from its current value to the axis X.



It is also possible to set by a filter minimums and maximums for displaying the graph. If offsets are set to 0, then they will not apply and the graph is displayed whole from min to max.

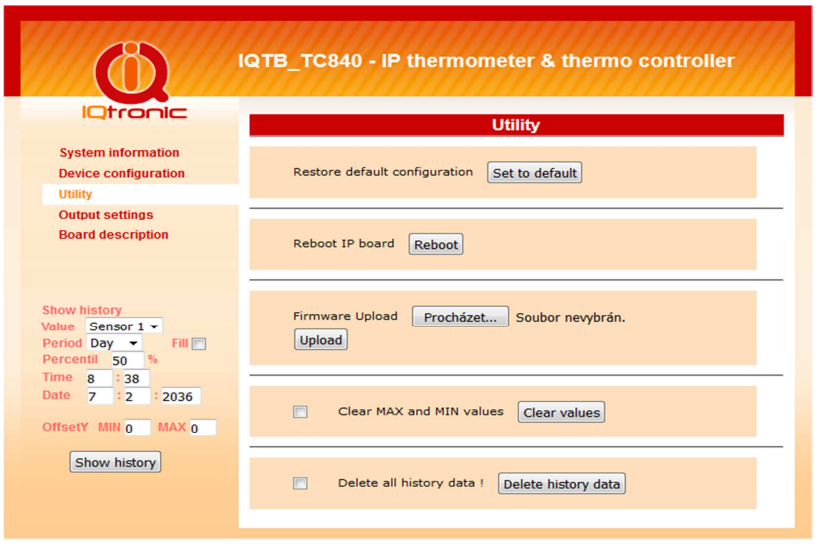
3.1 Setting device parameters



- Network parameters settings is defined by the first paragraph. It is not necessary to describe IP address, subnet mask, gateway, DNS, Device name and Location. To use a range of IP address assigned automatically, select DHCP server. After a succesful obtaining, these details will appear below this option, left of the static data.
- NTP server, domain name server for the current time together with the definition of time zone. The device has an internal timer that even in case of connection failure maintains current system time. However, for proper function and display the current time after restart of the device is necessary proper and functional setting of NTP server. The device will then self-correct and update.

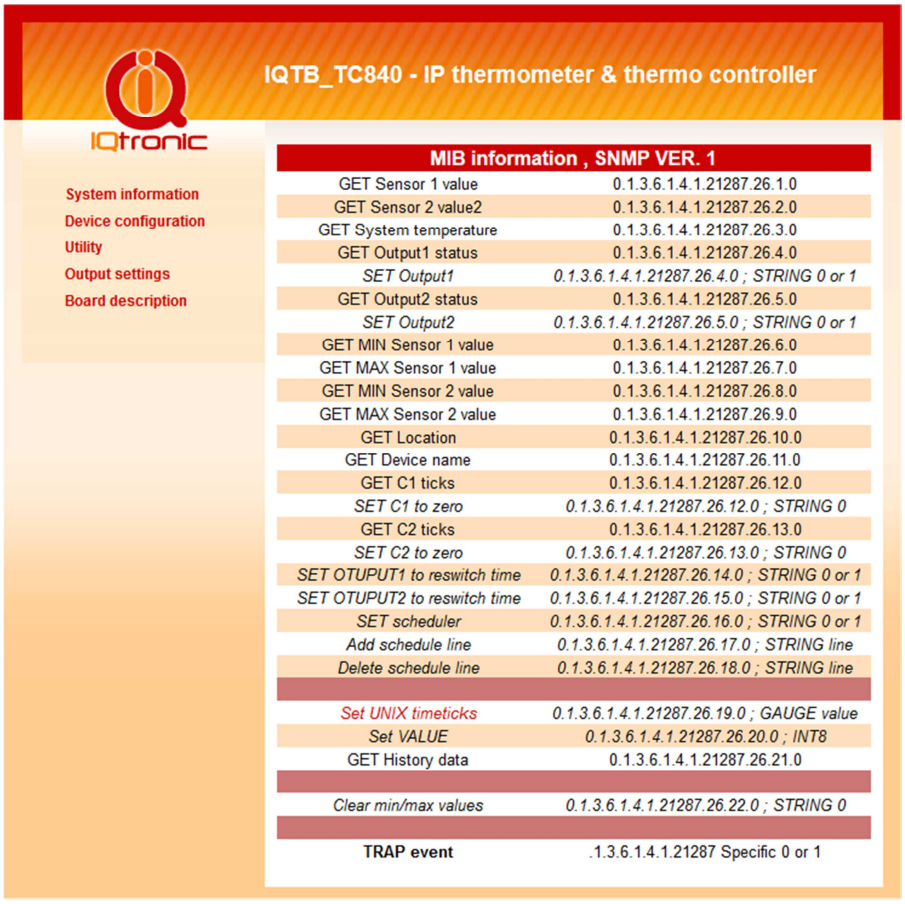
- User name, Login password – username to log-in security via HTTP.
- Except - exceptions – When selected, authentication wil not be required for the said HTML pages. It is possible to this way password protect the device configuration only. Main page with the values remain available to everyone.
- HTTP port – Port of the HTTP protocol
- Sensor unit - sensor units that appear in the history of the data and also convert.
- Sensor 1/2 ID, sensor ID, by default 0 for DS18B20. For other types is mentioned in the application data sheet for a given sensor, such as relative humidity sensor 1, etc.
- SNMP, option for reading and setting-up values using SNMP v.1.0 protocol. TRAP IP address is a destination address, where is sent potential TRAP packet to.
- Output control event. In case of meeting any of the conditions of the **"set output"** option, it will change the status of the output relay according to setting and a TRAP packet will be sent. In case that is chosen only TRAP, only this ALERT TRAP will be sent, if meeting set conditions without changing the status of the output relay. The relay can then be controlled only by using the SNMP or manually through the web or the button.
- Hysteresis - Hysteresis with an accuracy of 0.1 degrees, 2.0 represents a derogation + - 1 ° C from the set temperature in menu **Set output**. It's valid for any value of the sensor, not only for temperature.
- SNMP SET reswitch time – restart time for a short-term flip of the output relay when using SNMP SET - SET relay to reswitch time. For both outputs is identical.
- OUTPUT1/2 after start – the state of a relay output after switching power supply or restarting the device. NC - terminals C and NC connected, NO terminals C and NO connected, REM - connected terminals according to the last known state

3.3 Utility



- Set to default – factory default settings
- Reboot ip board – Device restart. The device starts with changed values if the user changed them.
- Upload – upload new device firmware update.
- Clear values – clear min/max of the values.
- Delete all history data - Clearing the entire data history!

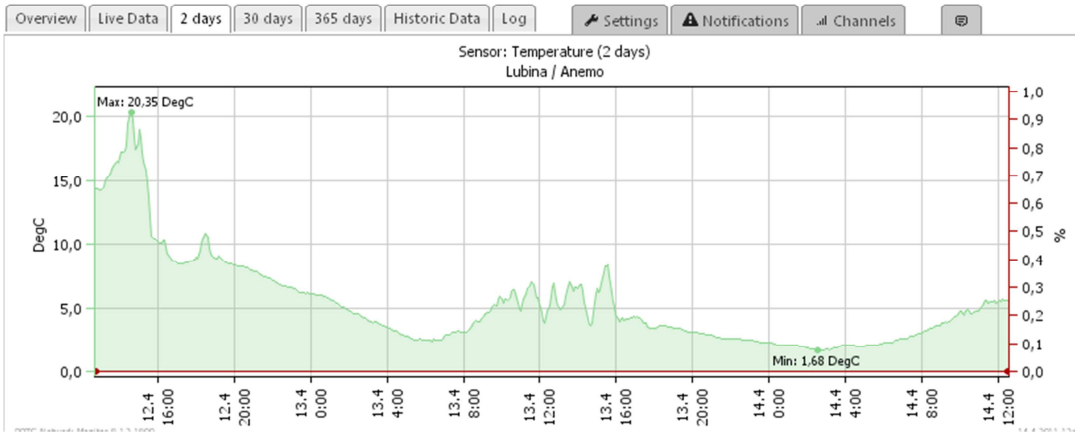
3.2 SNMP MIB table



MIB information , SNMP VER. 1	
GET Sensor 1 value	0.1.3.6.1.4.1.21287.26.1.0
GET Sensor 2 value2	0.1.3.6.1.4.1.21287.26.2.0
GET System temperature	0.1.3.6.1.4.1.21287.26.3.0
GET Output1 status	0.1.3.6.1.4.1.21287.26.4.0
SET Output1	*0.1.3.6.1.4.1.21287.26.4.0 ; STRING 0 or 1*
GET Output2 status	0.1.3.6.1.4.1.21287.26.5.0
SET Output2	*0.1.3.6.1.4.1.21287.26.5.0 ; STRING 0 or 1*
GET MIN Sensor 1 value	0.1.3.6.1.4.1.21287.26.6.0
GET MAX Sensor 1 value	0.1.3.6.1.4.1.21287.26.7.0
GET MIN Sensor 2 value	0.1.3.6.1.4.1.21287.26.8.0
GET MAX Sensor 2 value	0.1.3.6.1.4.1.21287.26.9.0
GET Location	0.1.3.6.1.4.1.21287.26.10.0
GET Device name	0.1.3.6.1.4.1.21287.26.11.0
GET C1 ticks	0.1.3.6.1.4.1.21287.26.12.0
SET C1 to zero	*0.1.3.6.1.4.1.21287.26.12.0 ; STRING 0*
GET C2 ticks	0.1.3.6.1.4.1.21287.26.13.0
SET C2 to zero	*0.1.3.6.1.4.1.21287.26.13.0 ; STRING 0*
SET OTUPUT1 to reswitch time	*0.1.3.6.1.4.1.21287.26.14.0 ; STRING 0 or 1*
SET OTUPUT2 to reswitch time	*0.1.3.6.1.4.1.21287.26.15.0 ; STRING 0 or 1*
SET scheduler	*0.1.3.6.1.4.1.21287.26.16.0 ; STRING 0 or 1*
Add schedule line	*0.1.3.6.1.4.1.21287.26.17.0 ; STRING line*
Delete schedule line	*0.1.3.6.1.4.1.21287.26.18.0 ; STRING line*
Set UNIX timeticks	*0.1.3.6.1.4.1.21287.26.19.0 ; GAUGE value*
Set VALUE	*0.1.3.6.1.4.1.21287.26.20.0 ; INT8*
GET History data	0.1.3.6.1.4.1.21287.26.21.0
Clear min/max values	*0.1.3.6.1.4.1.21287.26.22.0 ; STRING 0*
TRAP event	.1.3.6.1.4.1.21287 Specific 0 or 1

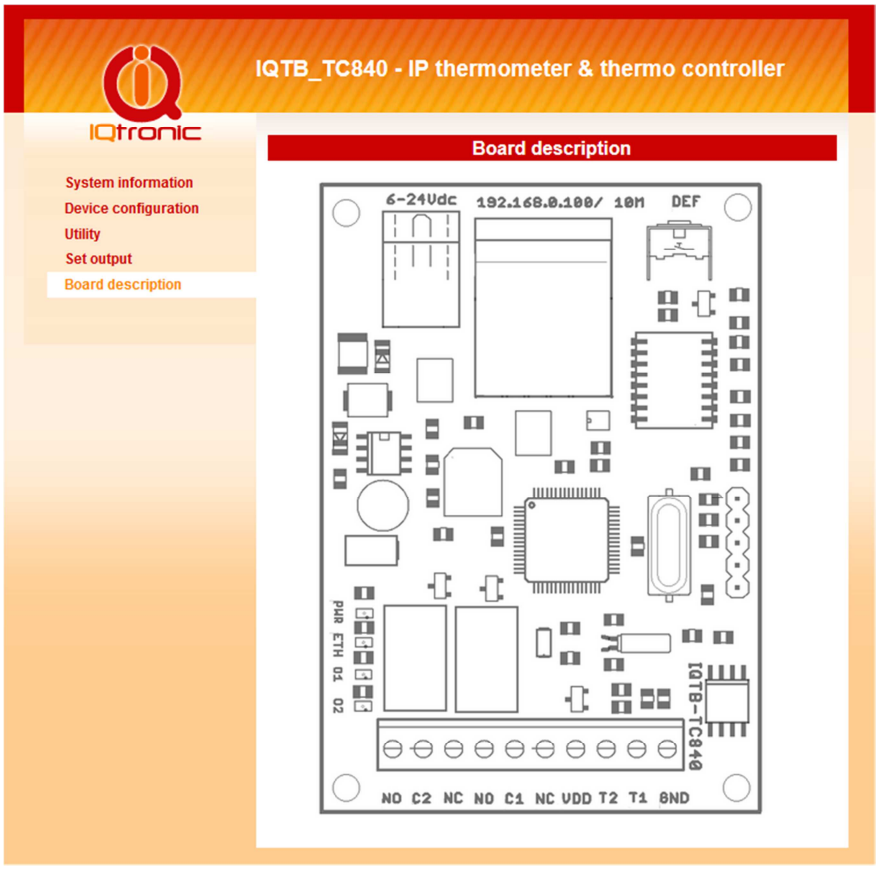
SNMP protocol allows reading of Instantaneous data from sensors that may be displayed by superior system, such as PRTG, as illustrated in the following picture.

Sensor Temperature

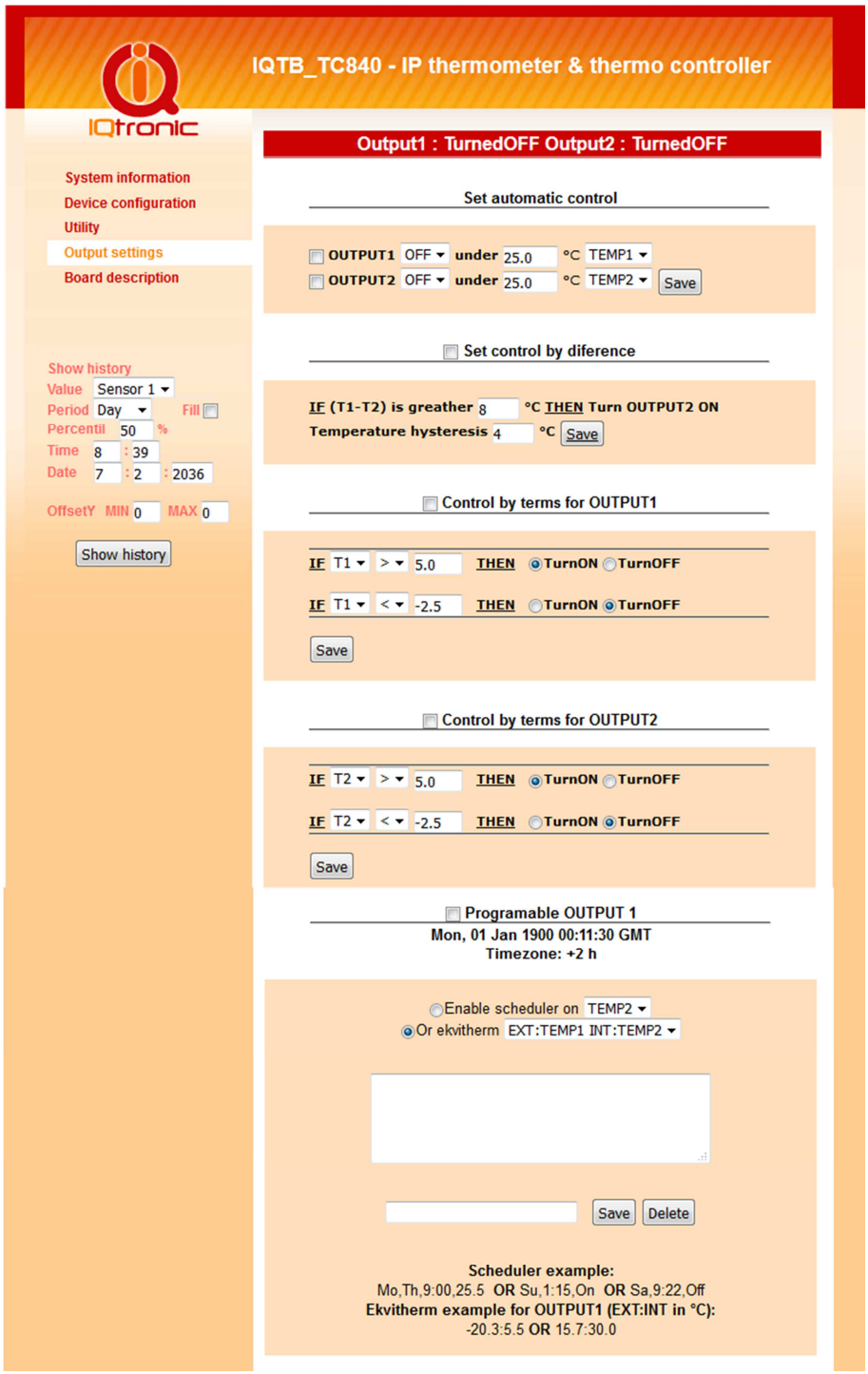


3.5 Description of connectors and board

For quick orientation in the wiring is possible to view a description of the board using Board description bookmark, for example in case of the loss manual.



3.6 Set output - menu for setting the output relays manually, automatically by the scheduler, by conditions, differentially or equithermal table.



Set automatic control - easiest and fastest setup of level monitoring. By using hysteresis of network settings. On each output can be set one sensor value monitoring.

Set control by diference - An input control based on differences in the values of two sensors. Operated is only output 2. Suitable for example for solar sets.

From the description it is clear that, if the difference T1-T2 is higher than 8 degrees, then the output 2 turns on. When the temperature difference falls by 4 degrees, then turns off. The output relay contacts are switchable so it is possible an inverse connection.

Set control by terms - Operation using user-defined conditions. Hysteresis are here given by the difference between maximum and minimum value. For each output you can set its own condition.

Programable OUTPUT 1, An automatic control of output 1 by the scheduler, or equithermal table / curve.

With every type it is possible to insert up to 30 lines regardless of the choice of **Scheduler / Ekvitherm.** You can only choose one of them. The entries for both will not be overwritten and remain saved. They are always displayed after option selection and confirming by the **Save** button.

Scheduler

It works only after obtaining a valid time from the NTP server.

Each inserted row indicates a change to the set temperature for a given time.

Example:

Keep a temperature of 25°C every day after 14:35 , and 10.5°C after 22:00.

Insert line:

Mo,Tu,We,Th,Fr,Sa,Su,14:35,25.0 press the **Save** button

Mo,Tu,We,Th,Fr,Sa,Su,22:00,10.5 press the **Save** button

If the lines are entered correctly they will be displayed in the main window.

To delete all the rows enter **ALL** and then **Delete** button, or enter a whole or partial text of the line and press **Delete**.

If we enter only a part, for example **Mo**, all lines that contain this substring will be erased.

You can define only a change in a given day:

Example:

Keep a temperature of 25°C every Monday after 00:00 and each Wednesday 10.5°C after 22:00.

Mo,00:00,25.0 press the **Save** button

We,22:00,10.5 press the **Save** button

Meaning of abbreviations: **Mo** – Monday, **Tu** – Tuesday,

We – Wednesday, **Th** – Thuersday , **Fr** – Friday,

Sa – Saturday, **Su** – Sunday.

Hysteresis is used from the **Network menu.**

Equitherm / heating curve.

Equitherm curve describes the dependence of one temperature to another. Respectively, the internal temperatures to the external temperature . You can insert up to 30 points.

Equithermal dependence we insert line by line and for each insertion of a line, press Save.

Syntax is : -20.3:5.5 or 10.5:35.0 , where the first temperature before the colon is the temperature EXT (external temperature, based on which is then maintaining the temperature INT) after the colon is the temperature of the internal (INT) - maintained in the given area.

Temperatures outside of inserted points are calculated by linear extrapolation. Values above the maximum or below the minimum are extrapolated.

Deletion we will perform by inserting the text "ALL" and pressing the Delete key or by a text containing a row for deletion.

Note: The device shown warning in status red line in case of wrong user input .

4 Use of the button DEF

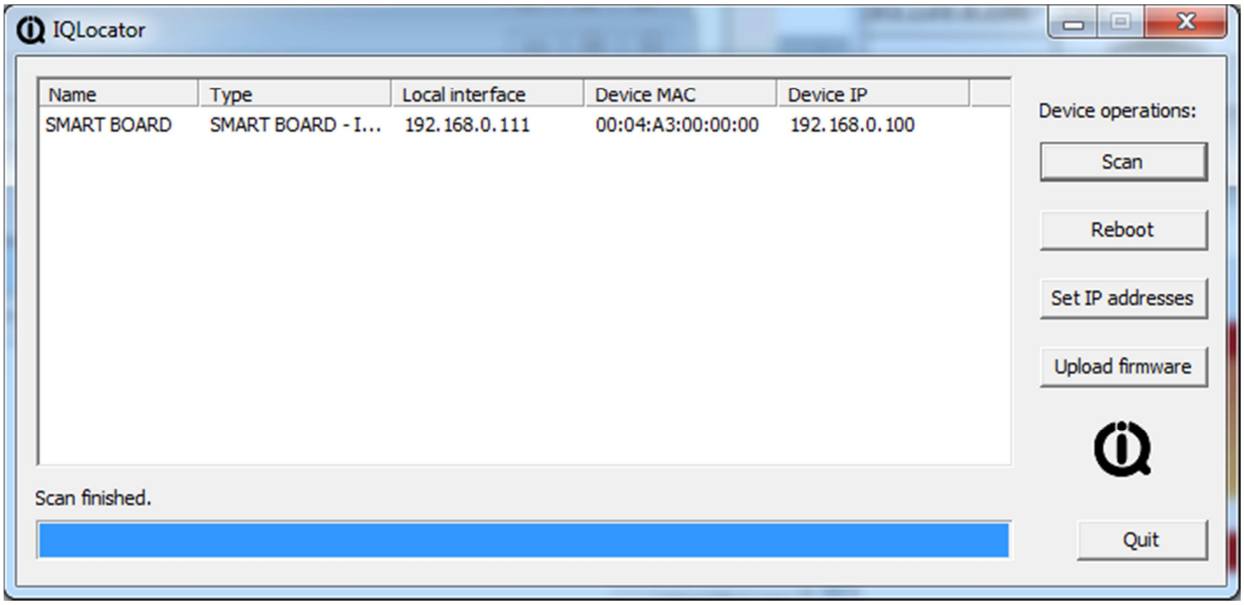
By briefly pressing a button on the the board we switch the output relay. If the button is held down for more than 4 seconds and then released, all LEDs will start flashing for 10 seconds. In case of further pressing during the blinking, the device will reset to factory settings.

5 Software

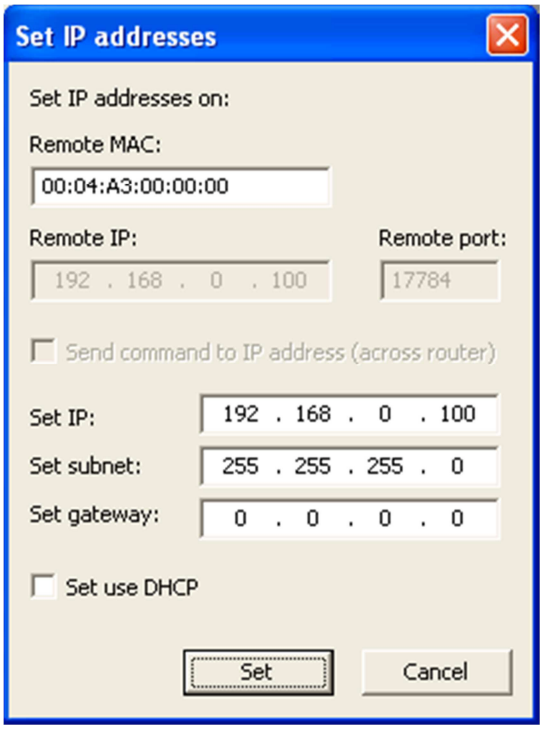
5.1 Utility IQlocator.exe

The program is used to quickly locate the device on a network, change its IP address and to upload new software updates - upload firmware.

The connected device is found after running the programs and pressing the SCAN button.



After pressing the button SET IP addresses, we can temporarily change the IP address for configuration directly in the device using a Web browser.

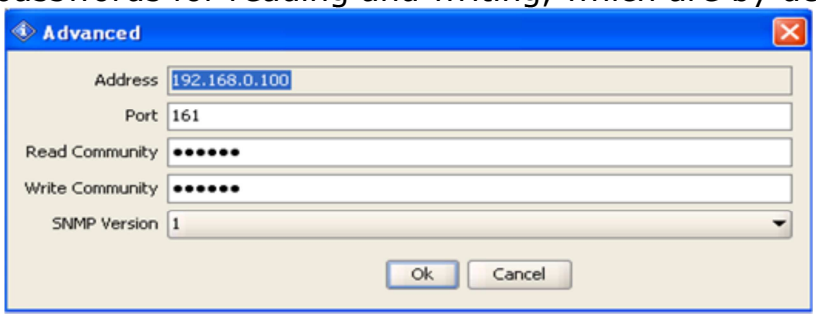


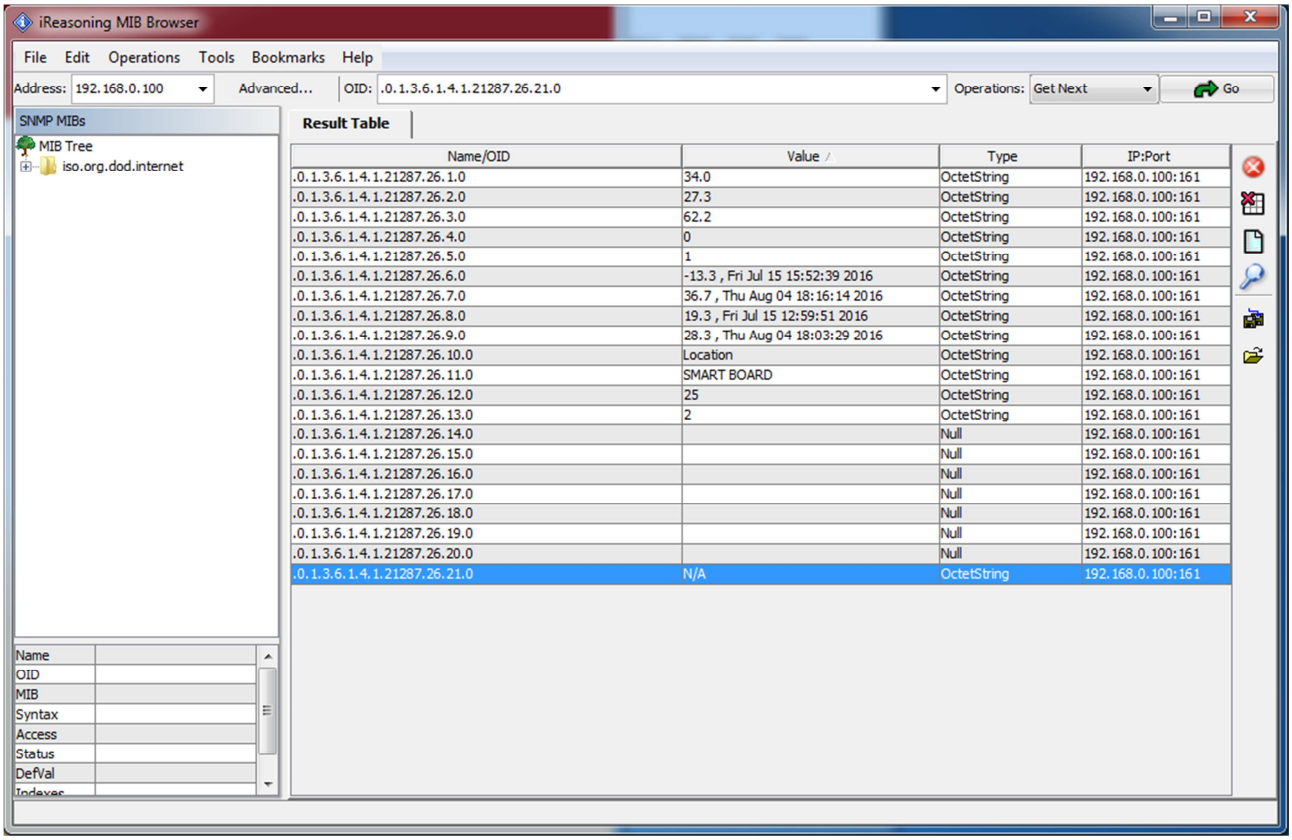
Also check the firewall settings, because they might successfully block the searching that is of a broadcast type.

6 Reading values using SNMP protocol.

To read the current values we shall use the program Ireasoning MIB Browser, which is free and has, inter alia, the TRAP packet receiver.After inserting the basic data such as Read Community etc. and enabling SNMP option in the **Device settings** - by default it is enabled, we can read through specific OID values of variables or even set the relay output status.

In the "Advanced Settings" set the device IP address, standard port 161 and passwords for reading and writing, which are by default both 'public'.

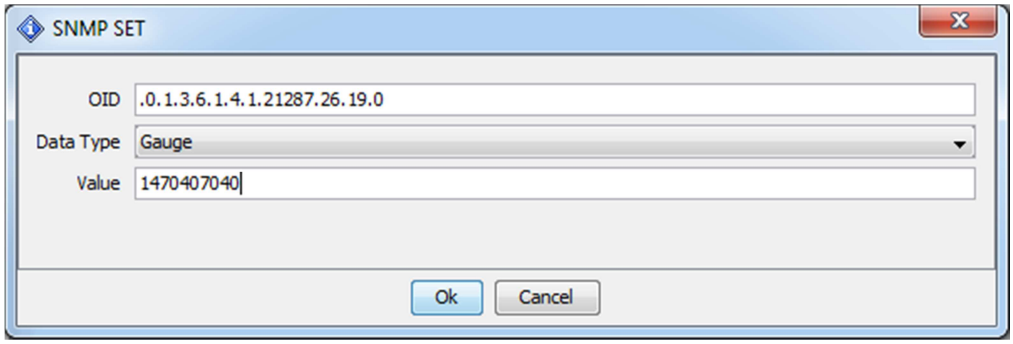




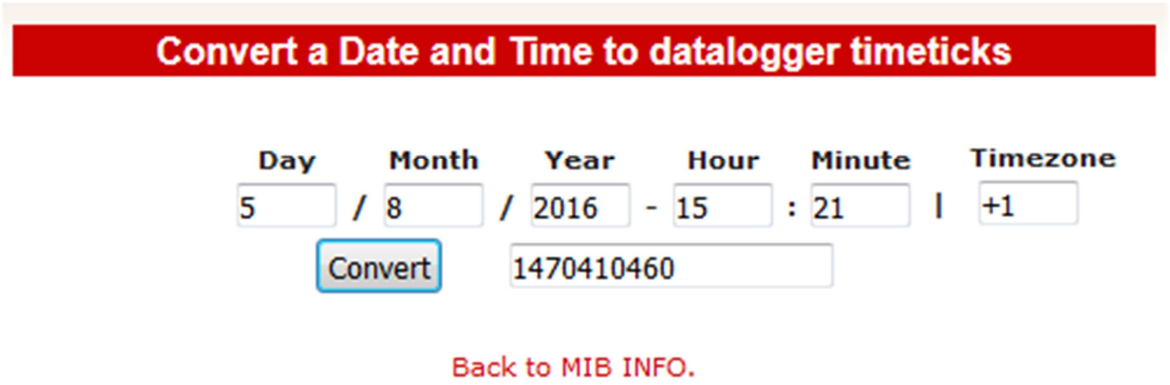
6.1 Reading values from history using SNMP.

For reading the history values, we use 3 OID.

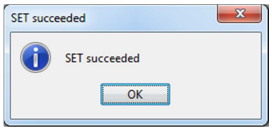
1. Set UNIX timeticks 0.1.3.6.1.4.1.21287.26.19.0 ; GAUGE value



For the conversion of time to UNIX value, you can use the calculator directly from the device's website:

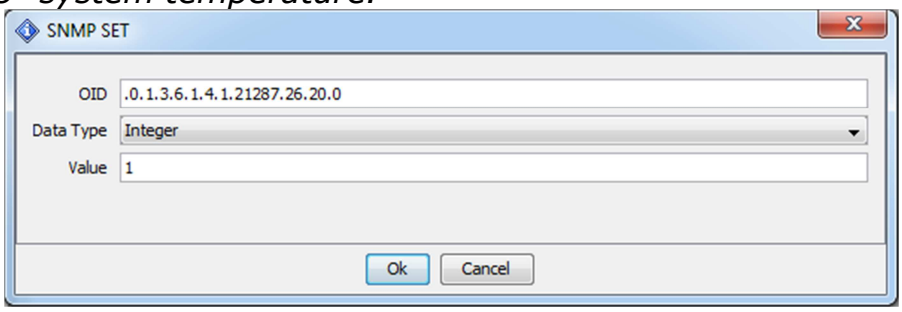


and confirm ...

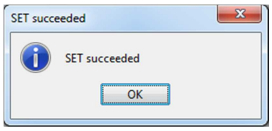


1. Set VALUE 0.1.3.6.1.4.1.21287.26.20.0 ; INT8

Put the sensor ID from which want to read the history. 1- input 1; 2- input 2; 3- system temperature.



and confirm ...



2. Get history data VALUE 0.1.3.6.1.4.1.21287.26.21.0

We obtain the data of a selected value for a particular time.
Must be noted that each reading, the internal time counter will increase by another *value, i.e., by 3 minutes and it is therefore possible to read continuously the whole block this way.*
For feedback control of data is for each value after the separator ':' the displayed serial number of reading. If the value is not available, returns N / A.

Name/OID	Value	Type	IP:Port
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 0	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 1	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.29 : 2	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 3	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 4	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.20 : 5	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.29 : 6	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.29 : 7	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.20 : 8	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 9	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.00 : 10	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	35.09 : 11	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.90 : 12	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.79 : 13	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.79 : 14	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.70 : 15	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.50 : 16	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.09 : 17	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	34.00 : 18	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	33.59 : 19	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	33.20 : 20	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	32.40 : 21	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	31.20 : 22	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	30.20 : 23	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	30.70 : 24	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	30.39 : 25	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	30.39 : 26	OctetString	192.168.0.100:161
.0.1.3.6.1.4.1.21287.26.21.0	31.50 : 27	OctetString	192.168.0.100:161

7 Reading using XML format, file status.xml

```
<status>
  <outputstatus1>TurnedON</outputstatus1>
  <outputcounter1>2</outputcounter1>
  <outputstatus2>TurnedOFF</outputstatus2>
  <outputcounter2>11</outputcounter2>
  <temperature2>2.23</temperature2>
  <t2max>N/A</t2max>
  <t2min>N/A</t2min>
  <temperature1>N/A</temperature1>
  <t1max>N/A</t1max>
  <t1min>N/A</t1min>
  <systemp>66.5</systemp>
  <tempunit>C</tempunit>
  <devname>IQTB-TC840</devname>
</status>
```

8 Specifications

Model	IQsocket IQTB-TC840
Power supply	recommended 12V DC ±20%, or passive PoE range 6-36Vst
Outputs	2x relay, 30v DC, 1A max (resistive or inductive load)
Inputs	2x 1-Wire DS18B20 , or IQTRONIC TITAN, GOLD
Network	RJ45, 10M Ethernet
Protocol	HTTP WEB, XML SNMP 1.0
Secutiry	Login password Read/Write community pro SNMP
Indicators	LED: Pwr,LINK/ACT 1+1,red, green Outputs: yellow LED 2x
Functions	Reading instantaneous values from sensor inputs via SNMP, WEB a XML. Manual control of outputs using SNMP, WEB and DEF button. Availability of min / max values through SNMP, XML and WEB Double thermostat, hygrostat Advanced programmable automatic control based on conditions of the scheduler, equiterm and difference.
Dimensions	72x50mm
Weight	0.035 kg netto
Operating temperature	-20 to +70 °C
Moisture	Max. 80%, non-condensing
Conformity	CE

9 Warranty and safety recommendations

- The product is provided by a standard warranty period of two years.
- The guarantee expires if the product has been modified, used outside the allowable voltage range and load, or use contrary to the manual.
- Do not expose the device to chemically aggressive environments, vibrations, falls, excessive moisture and temperature. It is designed for internal and dry environment.
- The maximum current load is 30V / 1A DC - resistive or inductive load for which the device is equipped with a special controller and for other loads, use a contactor.