

**Intelligent temperature, relative humidity and dew point meter with
ethernet connection**

T3511

Intelligent temperature transducer with ethernet connection

T4511

Instruction Manual



Introduction

The T3511 meter is designed to measure temperature, relative humidity and a dew point of air. The communication with the meter is over Ethernet. The meter consists of a plastic case with electronics and of a plastic probe on a cable with an air filter for temperature and relative humidity sensors. The probe is connected to the electronics. The device is designed for use in a non-aggressive environment .

The T4511 transducer is designed to measure temperature from an external probe with a Pt1000/3850ppm sensor. The probe is connected to the transducer by means of terminals. The transducer is built in a plastic case with the IP65 protection.

Measured values of the transducers

Instrument Model	Temperature	Humidity	Dew point
T3511	X	X	X
T4511	X	-	-

Table 1

General safety rules

The following summary is designed to prevent injury hazards or device damage. Operate the instrument in accordance with this manual to prevent electric trauma.

Service should be performed by a qualified person only.

Precautions against injury or fire

Use a safety ac/dc adapter. Use only an adapter with the power voltage recommended by its manufacturer and which is approved by proper standards. Check that the adapter has undamaged cables and cover.

Connect and disconnect correctly. Do not connect and disconnect a LAN cable or lead-in cables if the device is under electric voltage.

Do not use the instrument without the cover.

Do not use the instrument, if it does not work correctly. If the instrument seems not to work correctly, have it checked by a qualified service person.

Do not use the instrument in an explosive environment.

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General description

The Tx5xx devices are designed for measurement of temperature, dew point and humidity. Measured value can be displayed on the instrument LCD display, or it is possible to read it out by means of an Ethernet interface (to be subsequently processed in a PC). The following formats are supported:

- www pages with user-design possibility
- modbus protocol
- snmp protocol

The instrument may send a warning message to several defined points if the measured value gets out of adjusted limits. There are the following possible ways to deliver the warning report:

- to send an e-mail to maximum of three e-mail addresses
- to send a snmp trap to maximum of three IP addresses
- to display an alarm state on the device www page

Alarm limits may be set via modbus, telnet or a SNMP MIB table. The alarm state may be read via the device www pages, the information console or the SNMP MIB table. A block diagram of the device connection with to the PC is in Figure 1.

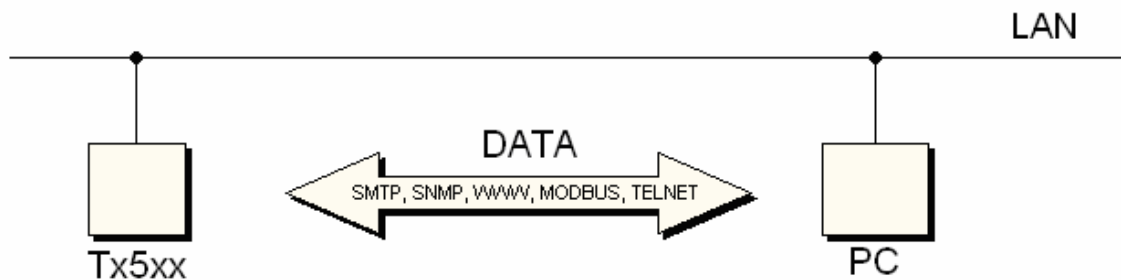


Figure 1- block diagram of the connection

Preparation to operation

In order to be able to use all the features of the device it is necessary to do some settings by means of a PC. In the case of T4511 transducer it is necessary to connect a temperature probe before use (see chapter Installation, page 7).

What is needed to operate instrument

- ac/dc adapter 9-30V, 200mA (more details - see chapter Power voltage page 7)
- RJ-45 LAN connection
- free IP address in your network
- temperature probe with a Pt1000 sensor for the T4511 transducer

Contact network administrator to get free IP address

Warning! Safety reception of warning messages (e-mail, trap) depends on actual accessibility of required network services. It is recommended to protect device against the unauthorized access to device settings and connection of cables.

Procedure of instrument connection

T3511 – follow Figure 2

- connect the LAN connector
- connect the power
- configure the device by means of a PC – see chapter Installation, page 7

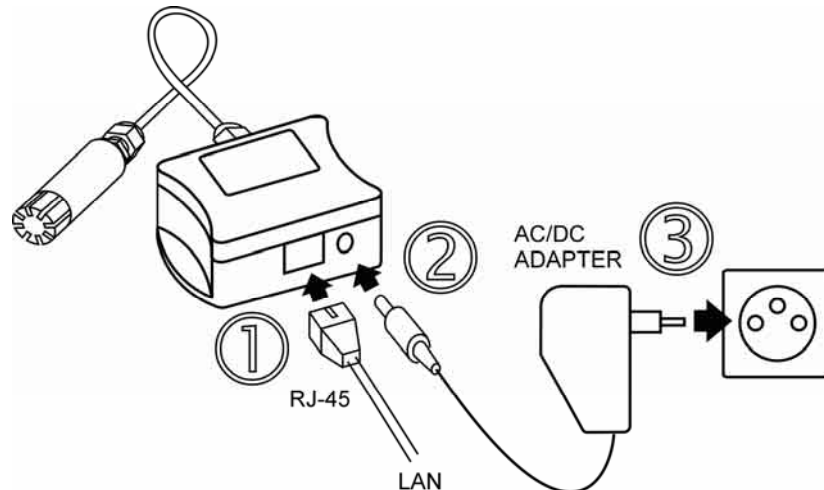


Figure 2 – procedure of T3511 device connection

T4511 – proceed in accordance with figures 3 and 4

- unscrew four screws from the front side of the transducer case and remove the lid
- get the cable through a sleeve on the case wall
- connect the LAN connector (Figure 4)
- connect the power supply
- configure the device by means of a PC – see chapter Installation, page 7

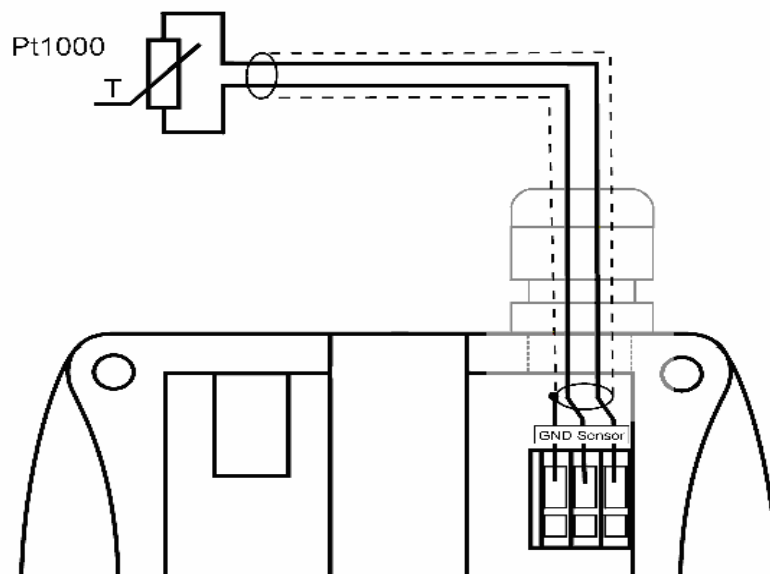


Figure 3 – connection of a Pt1000 probe to the T4511 transducer

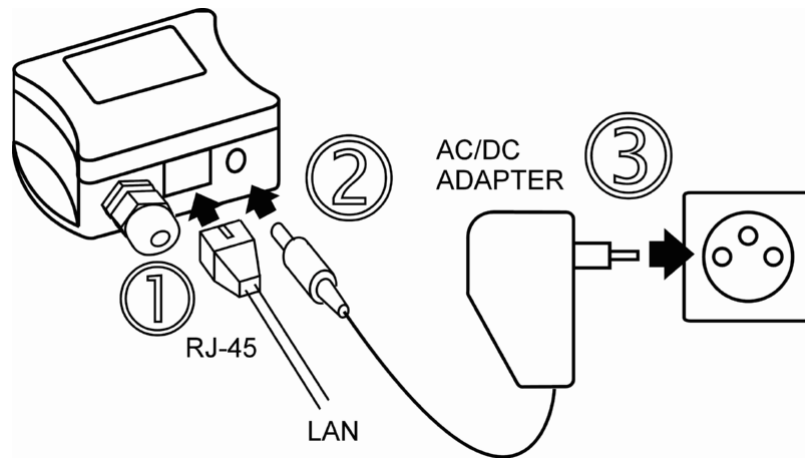


Figure 4. – connection of the T4511 transducer

Power voltage

Power voltage: 9 to 30Vdc, maximum consumption 200mA, connector coaxial, diameter 5 x 2.1 mm, positive pole is the central pole.

Installation

It is necessary to assign a new suitable IP address to the device at the first connection to it in order to prevent collisions with already existing network IP addresses, and make the address conform with the local habits. If installing several new devices, connect them to the network one after another! If a suitable IP address is not known, contact your network administrator and ask him for the following:

IP address: _____

IP gate address: _____

Mask of network: _____

The IP gate address and the network mask need not be specified if the device will be operated only in a local network. If you set the IP address to one which is already used in the network the device will not work correctly and collisions in the network will appear.

The IP address of each device is set by the manufacturer to **192.168.1.213**.

Installation procedure

- run a Tx5xx_setup.exe
- set a new IP address of the device (default IP address is 192.168.1.213)
- configure the device in accordance with your requirements (alarm settings, sending of e-mail, traps...)
- store the settings

See more details about use of the Setup in chapter Setting of device – Setup, page 17.

Checking operation

Visual check

After connecting the power supply the LCD displays a currently measured value (if the LCD has not been switched off). If the measured value exceeds the measuring range of the temperature probe or the temperature probe is not connected correctly Err 1 or Err 2 reading appears on the LCD. In this case check the temperature probe connection and that the value being measured is in the allowed measuring range. (Connection of the temperature probe is relevant only for the T4511 transducer).

Communication check via a LAN

Open a browser of www pages and enter the device IP address.

Example: <http://192.168.1.213>

The device displays its name, serial number, measured values, alarm states and alarm settings (Figure 5). If „Access denied“ appears instead, the display of www pages is not allowed (Figure 10). (Change the appropriate setting in the Setup - more details in chapter WWW- WWW configuration, page 20).

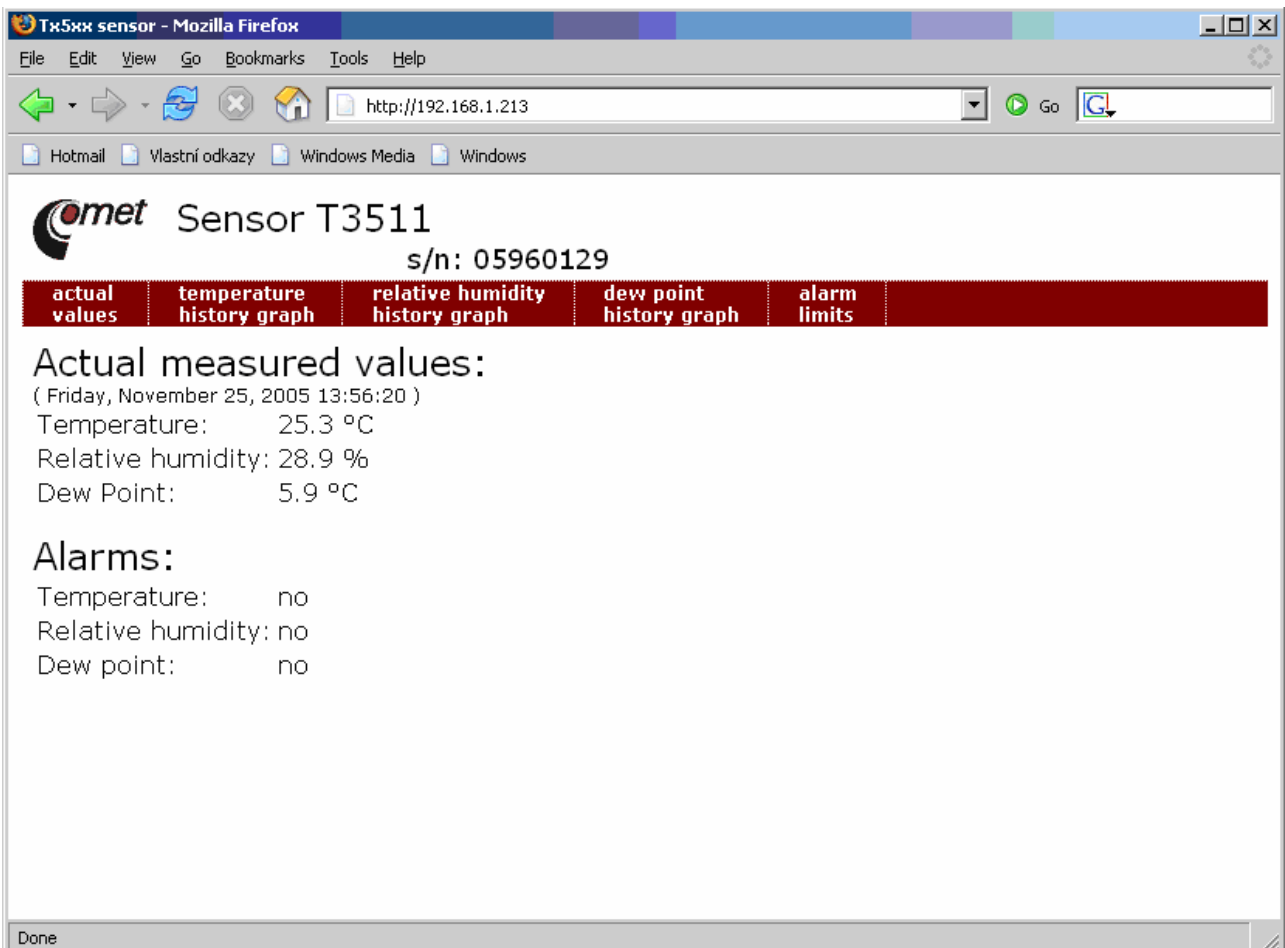


Figure 5 – device www pages

Calibration

Recommended calibration interval is

- one year for T3511

- two years for T4511

Storing

Store the device in a temperature range of -30 to +80 °C, non condensing humidity 0 to 99 %RH.

Description of device functions

Information provided by the device can be read on its LCD display or by means of the following protocols. To communicate via SNMP and modbus protocols it is necessary to have appropriate software installed on the computer. Such software is not included in the delivery.

The following part describes functions and features of the device.

Alarms

It is possible to set an upper limit, lower limit, hysteresis and time delay to each measured value.

Description of alarm function

Figure 6 shows a temperature curve with some specified upper limit (`temp_limit_high`) and hysteresis. At point 1 temperature exceeds the limit. From that moment a time delay is counted (`time_delay`) after which an alarm is set. Because at point 2 the temperature dropped below the limit value (`temp_limit_limit`) before the time delay expired, alarm was not set.

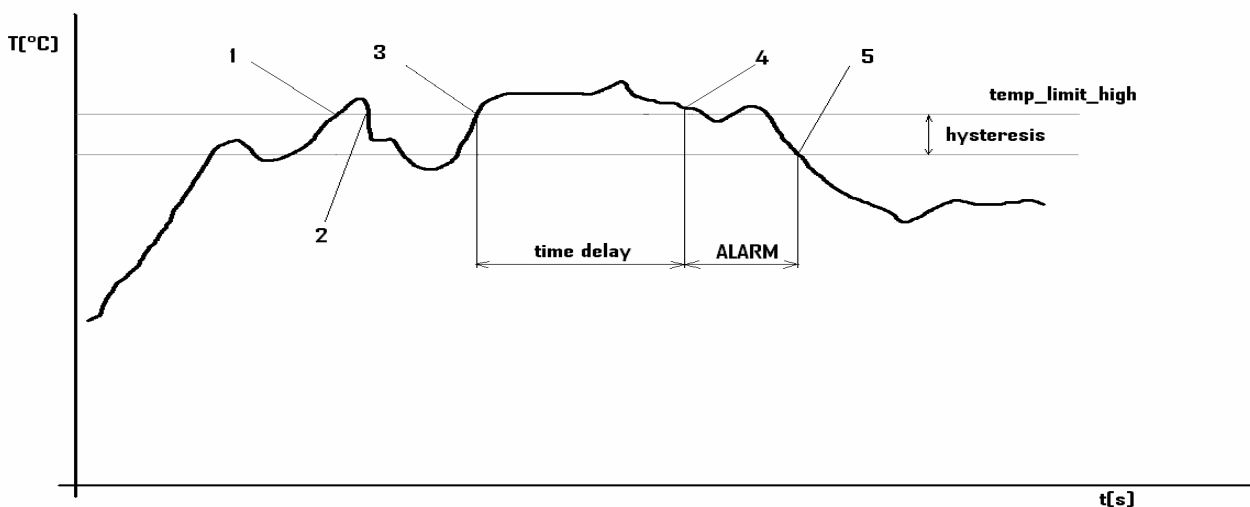


Figure 6 – temperature curve

At point 3 the temperature again exceeded the limit, and because it did not drop below the limit value (`temp_limit_high`) before the time delay ended, the alarm was set at point 4. At this moment the alarm e-mails and traps are sent, if they are enabled, and the alarm flag is set (the flag is set when the alarm is active and reset when inactive). The state of the flag can be found on the www pages or via Modbus or the information console. The alarm lasted to point 5, where the temperature dropped below the limit value given by the adjusted hysteresis (`temp_limit_high - hysteresis`).

For other measured values the principle of alarm activity is analogical.

An alarm report is always sent right after an alarm appears. The device memorizes sent alarm reports of current alarms while the power is connected. In case of power disconnection or a

reset of the device (e.g. by modification of configuration) a new alarm evaluation is performed and new alarm reports are sent again, if any.

It is possible to set the alarm parameters via telnet, modbus protocol or a SNMP MIB table. Detailed description of setting via these protocols can be found in chapters informing about particular services.

Modbus

The device contains support for the Modbus protocol to communicate with control systems. The protocol runs in the RTU mode. The port is set to 501 (for more details about the Setup see chapter Setting of device – Setup, page 17). The modbus address of the device is always set to 1.

Port 501 enables full access, i.e. both read and write operations are supported. Access to port can be disabled in the Setup.

Supported Modbus commands:

Command	Code	Description
Read multiple register(s)	0x03	Reads 16 bit register(s)
Write multiple register(s)	0x10	Writes 16 bit register(s)

Modbus registers of the device:

Variable	Unit	Format	Address	Size[bits]	Status
measured temperature	[°C]	Int*10	0x0031	16	r
measured relative humidity	[%]	Int*10	0x0032	16	r
dew point temperature (DP)	[°C]	Int*10	0x0033	16	r
lower limit for temperature	[°C]	Int*10	0x5001	16	r/w
upper limit for temperature	[°C]	Int*10	0x5002	16	r/w
lower limit for humidity	[%]	Int*10	0x5003	16	r/w
upper limit for humidity	[%]	Int*10	0x5004	16	r/w
lower limit for dp	[°C]	Int*10	0x5005	16	r/w
upper limit for dp	[°C]	Int*10	0x5006	16	r/w
temperature hysteresis	[°C]	Int*10	0x5007	16	r/w
tolerated time of exceeding of temperature	[s]	uInt	0x5008	16	r/w
RH hysteresis	[%]	Int*10	0x5009	16	r/w
tolerated time of exceeding of RH	[s]	uInt	0x500A	16	r/w
DP hysteresis	[%]	Int*10	0x500B	16	r/w
tolerated time of exceeding of DP	[s]	uInt	0x500C	16	r/w
Temperature alarm status	[-]	Ascii	0x500D	16	r
RH alarm status	[-]	Ascii	0x500E	16	r
DP alarm status	[-]	Ascii	0x500F	16	r

Legend:

- r register is designed for read
- w register is designed for write
- Int*10 register is in format of integer*10.
- uInt register is at range of 0-65535

- Ascii character

Temperature, RH and DP alarm states can have the following values:

- no value is inside of adjusted limits
- lo value is lower than adjusted limit
- hi value is higher than adjusted limit

Registers can be read one by one. But it is necessary to write all 15 values to the memory 0x5001 – 0x500F together as a block (alarm states are not affected).

SMTP

In case of exceeding adjusted limits of measured values the device can send e-mails to maximum of three addresses. Maximum length of an e-mail address is 55 characters. It is necessary to set your SMTP server address for correct function of e-mail sending. Procedure how to set SMTP is described in chapter Setting.

If limits of several measured values are exceeded a special alarm e-mail is sent for each alarm state.

Dummy address `sensor@[device IP address]` is displayed as a sender of the e-mail. It is not possible to reply to this address. In the Subject field of the message the sentence `Alarm [Description of the device]*` is displayed or `Test message [Description of the device]` in the case of sending a test e-mail.

*[Description of the device] can be entered in the Setup (chapter Global settings, page 19)

The description of the device is preset to the string `TRh-Sensor`, or `T-Sensor` depending on the device model. Figure 7 shows a message reporting exceeding the temperature limit.

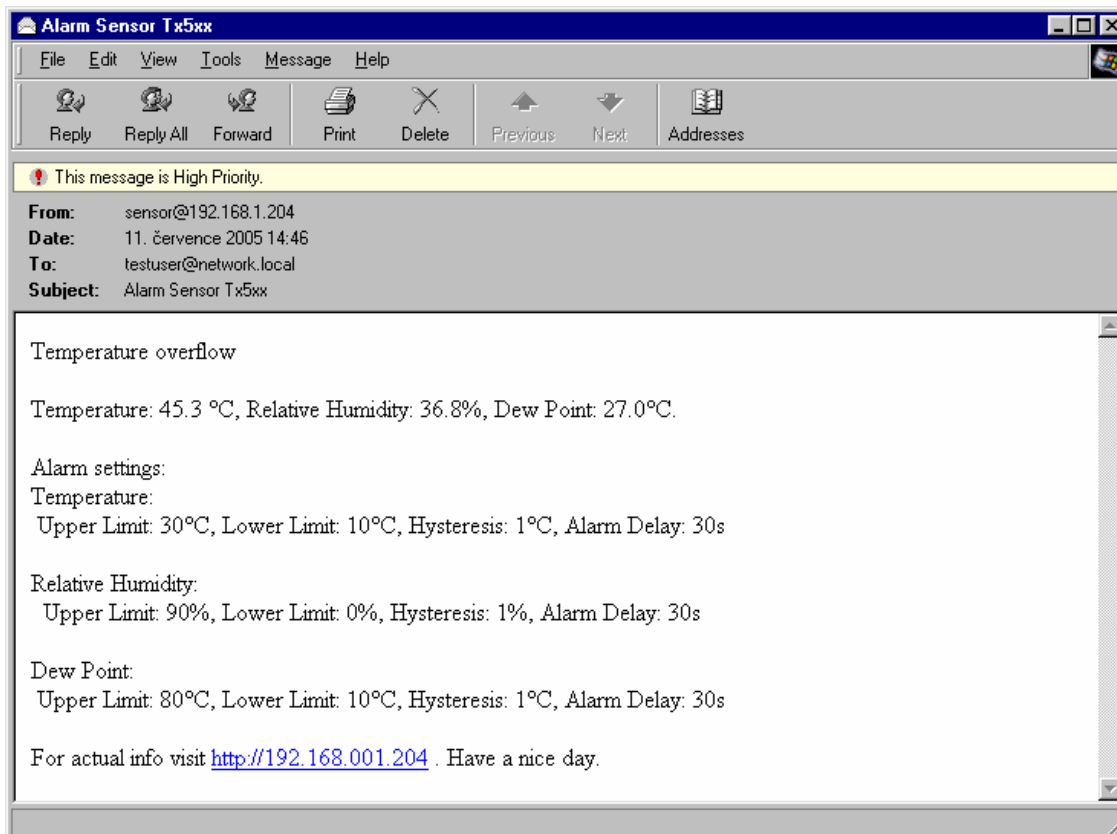


Figure 7 – example of an e-mail from the device reporting exceeding of temperature limit

Format of the message:

- Information report
 - Temperature overflow – temperature limit exceeded
 - Humidity overflow – humidity limit exceeded
 - Dew point overflow – dew point temperature limit exceeded
- Currently measured value at the time when the alarm was raised
- Current setting of alarm limits.
- For actual info please visit `http://[IP device]`. Have a nice day – for actual information please visit www pages of the device at address `http://[IP address device]`.

SNMP

By means of the SNMP protocol it is possible to find currently measured values, read and set parameters concerning alarms. In case of alarm activation, warning message (a trap) can be sent to specified addresses. By means of the SNMP MIB table it is also possible to display history of last 100 measured values.

For read and write the device communicates via port 161. Traps are sent via port 162. Sending of traps can be disabled in the Setup.

The following traps sent:

- 0/0 reset of the device
- 1/0 testing trap
- 6/3 report on a measured value being outside of the limits or a return of the measured value to the limits

For the correct function of the SNMP server it is necessary to store the MIB table RFC-1213.mib and Tx5xx.mib to the client MIB. The path to the device is then:

iso.org.dod.internet.private.enterprises.comet.products.tx5xx.

MIB tables are available at www pages <http://www.cometsystem.cz> or on the installation CD in the MIB directory.

There are the following other branches of the tree:

Branch	List	Description	Write	Format	Complete path
Readings	temperature	current temperature	no	string	1.3.6.1.4.1.22626.1.2.1.1.0
	humidity	current humidity	no	string	1.3.6.1.4.1.22626.1.2.1.2.0
	dewpoint	current dew point	no	string	1.3.6.1.4.1.22626.1.2.1.3.0
Settings	templow	lower limit of temperature	no	string	1.3.6.1.4.1.22626.1.2.2.1.0
	temphigh	upper limit of temperature	no	string	1.3.6.1.4.1.22626.1.2.2.2.0
	humiditylow	lower limit of humidity	no	string	1.3.6.1.4.1.22626.1.2.2.3.0
	humidityhigh	upper limit of humidity	no	string	1.3.6.1.4.1.22626.1.2.2.4.0
	dewpointlow	lower limit of dew point	no	string	1.3.6.1.4.1.22626.1.2.2.5.0
	dewpointhigh	upper limit of dew point	no	string	1.3.6.1.4.1.22626.1.2.2.6.0
	temptime	time delay for temperature alarm alerting	no	Int	1.3.6.1.4.1.22626.1.2.2.7.0
	humidityTime	time delay for humidity alarm alerting	no	Int	1.3.6.1.4.1.22626.1.2.2.8.0
	dewPointTime	time delay for dew point alarm alerting	no	Int	1.3.6.1.4.1.22626.1.2.2.9.0
	tempHyst	temperature hysteresis	no	string	1.3.6.1.4.1.22626.1.2.2.10.0
	humidityHyst	humidity hysteresis	no	string	1.3.6.1.4.1.22626.1.2.2.11.0
	dewPointHyst	dew point hysteresis	no	string	1.3.6.1.4.1.22626.1.2.2.12.0
readingsint	temperaturei	current temperature	no	int*10	1.3.6.1.4.1.22626.1.2.3.1.0
	humidity	current humidity	no	int*10	1.3.6.1.4.1.22626.1.2.3.2.0
	dewpointi	current dew point	no	int*10	1.3.6.1.4.1.22626.1.2.3.3.0
settingsint	templowi	lower limit of temperature	yes	int*10	1.3.6.1.4.1.22626.1.2.4.1.0

	temphighi	upper limit of temperature	yes	int*10	1.3.6.1.4.1.22626.1.2.4.2.0
	humiditylowi	lower limit of humidity	yes	int*10	1.3.6.1.4.1.22626.1.2.4.3.0
	humidityhighi	upper limit of humidity	yes	int*10	1.3.6.1.4.1.22626.1.2.4.4.0
	dewpointlowi	lower limit of dew point	yes	int*10	1.3.6.1.4.1.22626.1.2.4.5.0
	dewpointhighi	upper limit of dew point	yes	int*10	1.3.6.1.4.1.22626.1.2.4.6.0
	temptime	time delay for temperature alarm alerting	yes	Int	1.3.6.1.4.1.22626.1.2.4.7.0
	humidityTime	time delay for humidity alarm alerting	yes	Int	1.3.6.1.4.1.22626.1.2.4.8.0
	dewPointTime	time delay for dew point alarm alerting	yes	Int	1.3.6.1.4.1.22626.1.2.4.9.0
	tempHysti	temperature hysteresis	yes	int*10	1.3.6.1.4.1.22626.1.2.4.10.0
	humidityHysti	humidity hysteresis	yes	int*10	1.3.6.1.4.1.22626.1.2.4.11.0
	dewPointHysti	dew point hysteresis	yes	int*10	1.3.6.1.4.1.22626.1.2.4.12.0
history	temperature	temperature	no	int*10	1.3.6.1.4.1.22626.1.2.6.1.1.1
	humidity	humidity	no	int*10	1.3.6.1.4.1.22626.1.2.6.1.1.2
	dewPoint	dew point	no	int*10	1.3.6.1.4.1.22626.1.2.6.1.1.3

Meaning of trap list strings values:

- 0 trap was not sent – measured value is within the limits
- 1 upper limit exceeded
- 2 lower limit exceeded

Password for a read operation is set by the manufacturer to PUBLIC, password for write is set to PRIVATE. These passwords may be changed in the setup.

History

By means of the MIB table it is possible to display history of the last 100 measured values, stored in adjusted time interval. This interval is set in the Setup (chapter SNMP- Trap Configuration, page 20). If a value has not been measured yet or an error was detected the value is 9999. The history is erased after each restart of the device.

WWW

The device supports display of measured values, adjusted limits and alarm states on its www pages. The address of the www pages is identical with its IP address. There are the two modes supported:

- text version
- user-defined web (Graphics web)

In the user-defined web is possible show the history graphs, including pictures and upload self-made web to device. More info about user-defined web you can find on <http://cometsystem.cz> section programs. You can switch between this modes in setup. The demo of user-defined web is showed on picture 8-b.

The web address is the same like the device IP.

Example: The device has an IP address 192.168.1.204. Enter <http://192.168.1.204> to the browser address field and confirm it with the Enter key. If your setup enables display of www pages and the user-defined web is disabled, page will be displayed as in Figure 8-a.

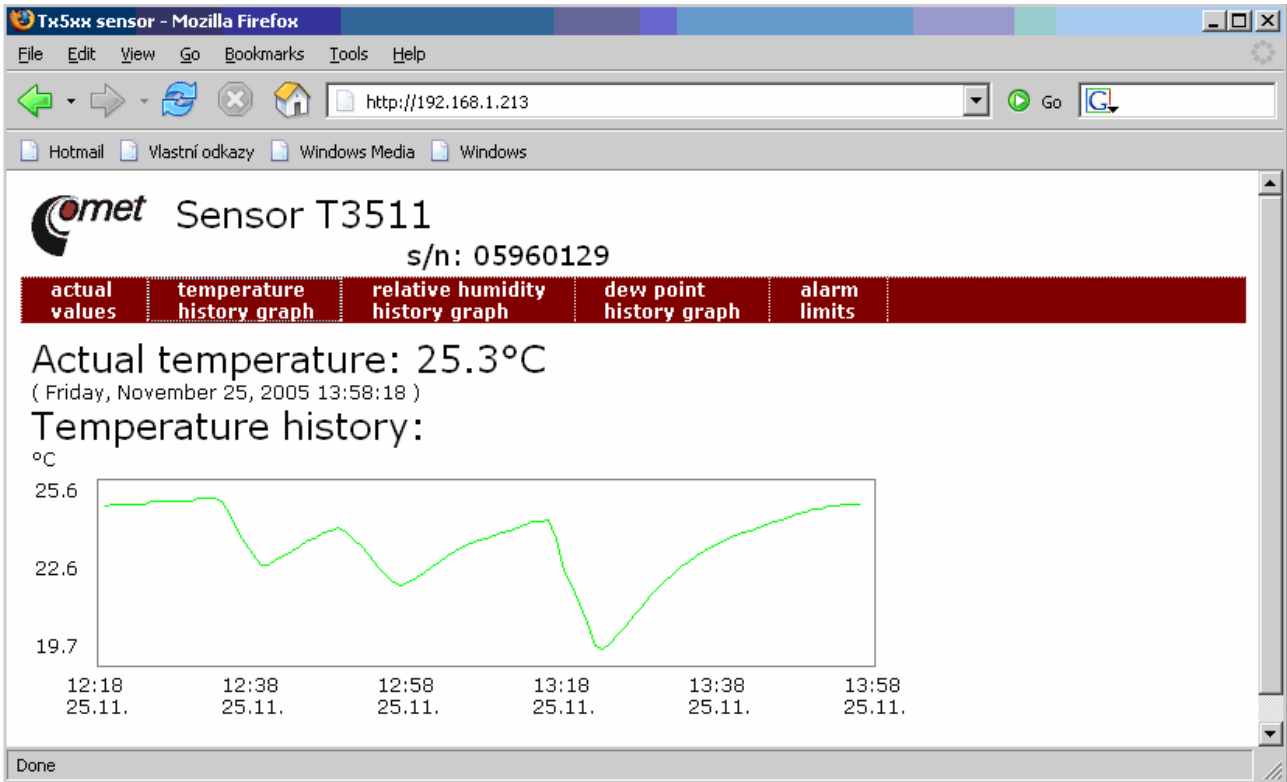


Figure 8-b – User-defined web



Figure 8-a – www pages of the device

Description of the device is displayed on line 1. Description is displayed also in the subject of the e-mail, if sending is enabled. Currently measured values follow: temperature, humidity, dew point, alarm states and setting of alarms. In case of the T4511 temperature transducer, only temperature readings are displayed.

WWW pages have adjustable automatic refresh interval. The manufacturer sets it to 60 seconds. The value can be modified in the setup in a range of 10–65535s. If the device has www pages display disabled screen as in Figure 9 appears.

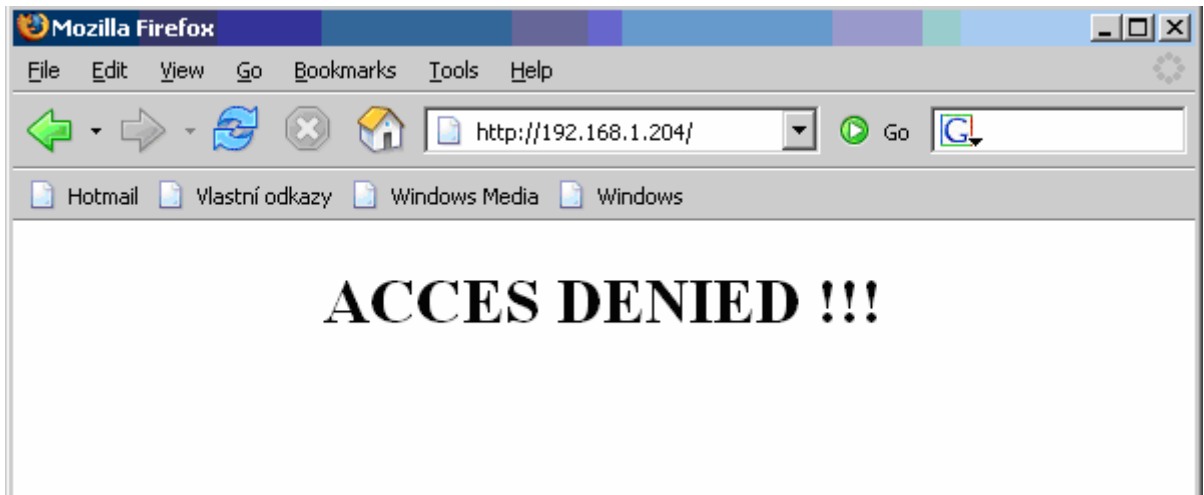


Figure 9 –device with disabled www pages display

Setting of device – Setup

The Setup is designed for managing device settings. Setting is performed by means of Tx5xx_setup program, or telnet. Setting thru the telnet is described in separated document on <http://www.cometsystem.cz>. Access to the Setup can be protected by a password. The Tx5xx_setup program you can find on <http://www.cometsystem.cz> or on installation cd.

Setting of the device:

- run the Tx5xx_setup.exe program
- enter the device IP address to “Enter device IP” field and press “Connect”. The factory default IP address is 192.168.1.213. If you don’t know the device’s IP address, press the “Find device...” button to enter to find window. In this window select wanted device field and press the “Select” button

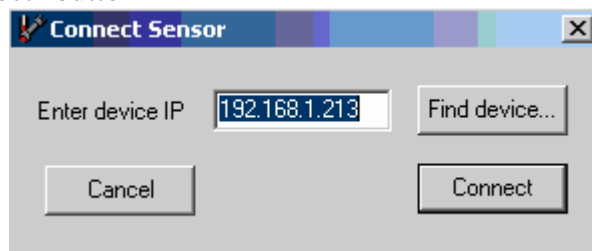


Figure 11 – Connect sensor

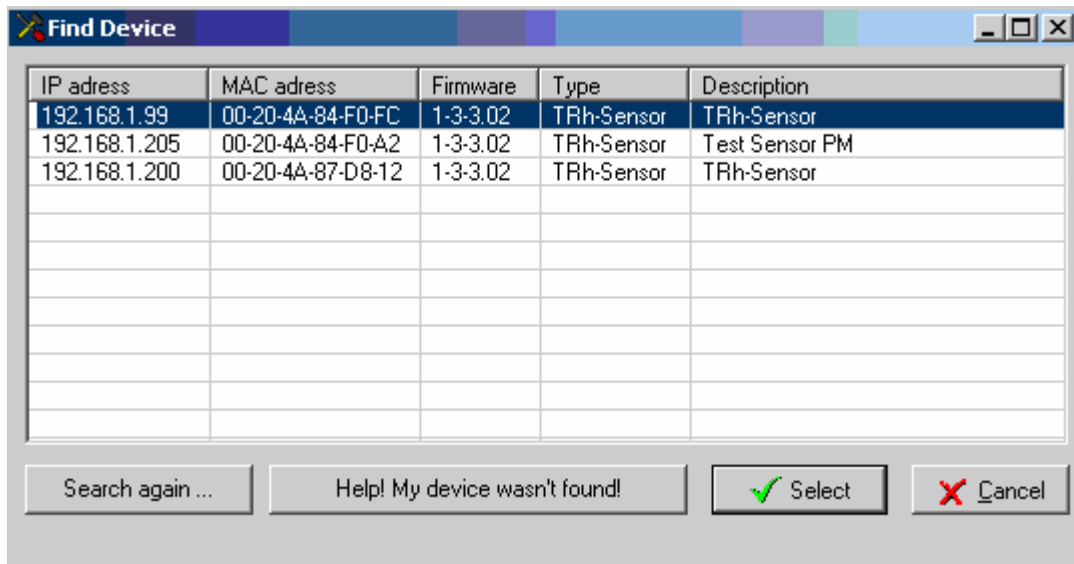


Figure 12 - Find device

- next to press the “Connect” button will be the device settings showed (Fig. 13). By the T4511 device will be the humidity and dew point settings not appears.

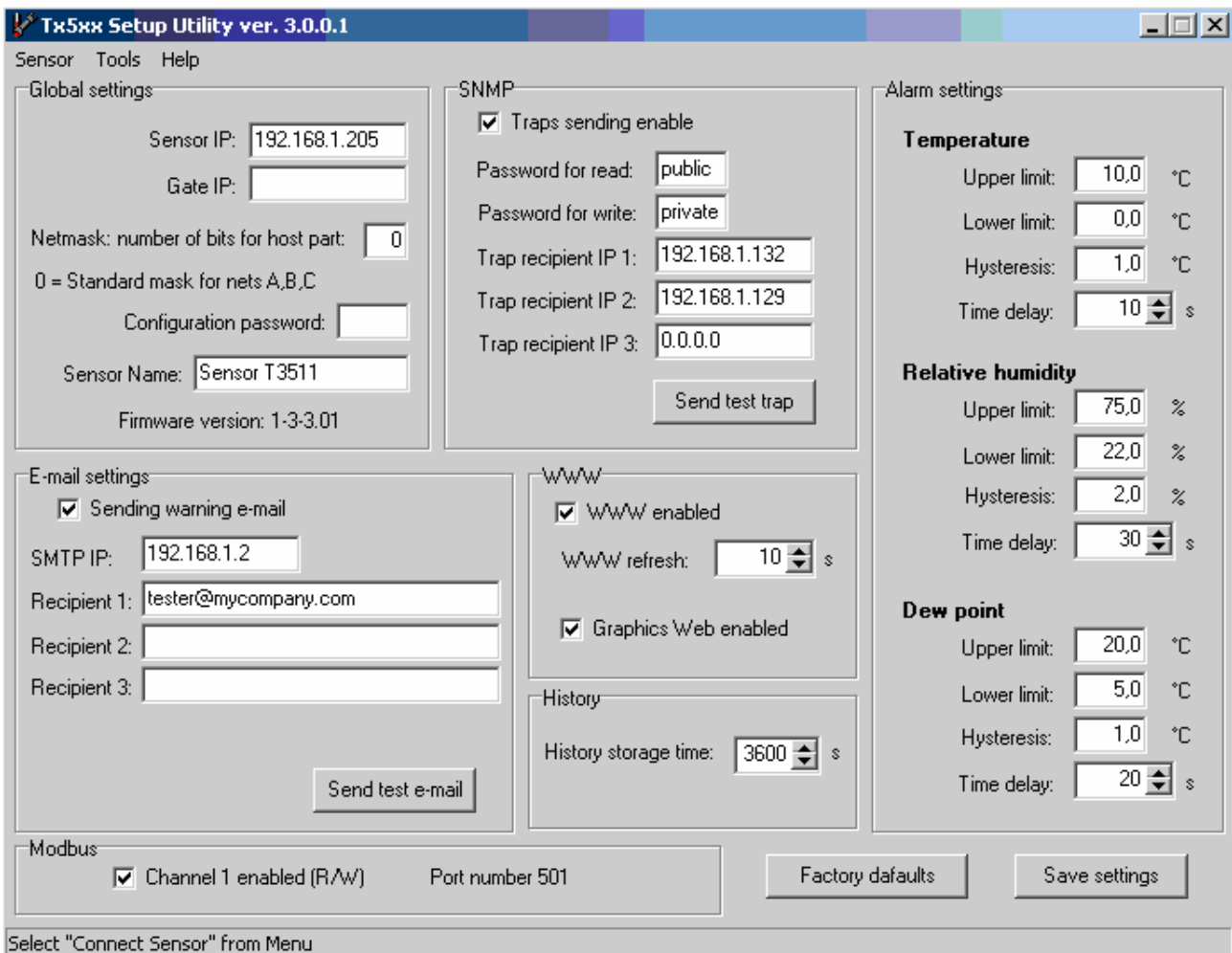


Figure 13 – Sensor settings

Global settings

Contact your network administrator to get the correct values of the IP address, mask, gateway. Entering incorrect values can cause the device be not found in the network or other complications!

Sensor IP: setting of the IP address of the device.

Gate IP: setting of the internet gateway. The value need not be entered if the device will operate only in a local network.

Netmask: setting of the network mask of your network.

Example:

mask	no. of bits
255.255.255.252	2
255.255.255.0	8
255.128.0.0	23

Configuration password: change of the access password for telnet.

Sensor name: The description of the device (it is possible to change it if needed). This description is displayed on WWW pages and in subjects of sent e-mails. Its maximum length is 32 characters.

E-mail settings- SMTP configuration

Sending warning e-mail: Enabling of sending warning e-mails after alarm activation.

SMTP IP: setting of an IP address of the SMTP server. Correct setting is required for the device to be able to send e-mails . Contact your network administrator to get the correct address.

recipient 1-3: e-mail addresses of warning e-mail recipients.

Send test email: In case of confirmation a test e-mail is sent to the specified addresses.

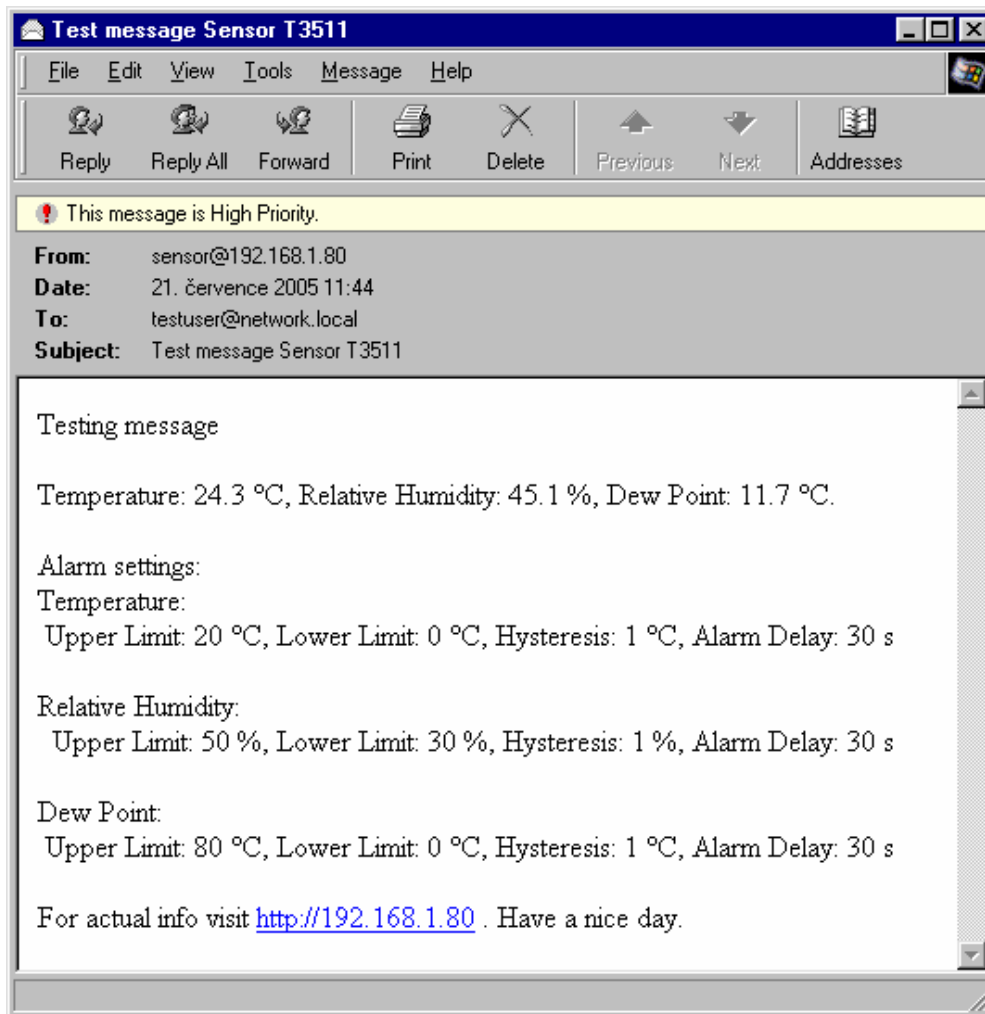


Figure 14 – Example of the Test E-mail

SNMP- Trap Configuration

traps sending enable: enabling/disabling of sending SNMP traps.

Password for read: setting of the password for access to SNMP MIB tables.

Password for write: setting of the password for write to SNMP MIB table of the device.

Trap IP 1-3: the IP address of recipients of SNMP traps.

Send test trap: Sends a test trap of type 1/0 to the specified IP addresses.

WWW- WWW configuration

WWW enable: enables the display of www pages

Web refresh time: interval for automatic page refresh (update of measured values). Range 10–65535 s.

Graphics web enabled: switch between user-defined web and web text mode.

Modbus- Modbus configuration

Setting of Modbus. The device provides access to measured values by means of the modbus. The port is non-adjustably fixed to 501

Modbus Channel 1 enabled : enables the access to the device

Alarm configuration

Setting of alarms. This submenu contains:

- setting of upper temperature limit
- setting of lower temperature limit
- setting of temperature hysteresis
- setting of temperature time delay
- setting of upper limit for humidity
- setting of lower limit for humidity
- setting of hysteresis for humidity
- setting of time delay for humidity
- setting of upper limit for dew point
- setting of lower limit for dew point
- setting of hysteresis for dew point
- setting of time delay for dew point

Factory defaults – setting from the manufacturer

This selection sets the Setup items to the following values:

- sets SMTP server address to 0.0.0.0
- erases addresses of e-mail recipients
- disables sending of e-mails
- erases addresses of snmp traps recipients
- disables sending of traps
- enables display of www pages
- set Graphics web
- sets refresh time of www pages to 60 seconds
- enables access via modbus
- sets history logging interval to 60 s
- setting of alarms: upper temperature limit: 300 °C, lower temperature limit: -200 °C, temperature hysteresis: 1 °C, time delay for alarm activation after exceeding temperature limit: 30 s, upper humidity limit: 100 %RH, lower humidity limit: 0 %RH, humidity hysteresis: 1 %RH, time delay for humidity alarm activation after exceeding limit: 30 s, upper limit of dew point: 80 °C, lower limit of dew point: -50 °C, hysteresis of dew point: 1 °C, time delay for dew point alarm activation after exceeding limit: 30 s.
- set sensor name to TRh-Sensor or T-Sensor

Save settings

Saves modifications to the memory and resets the device.

What to do when...

I forgot the IP address of the device

Finding the device IP address

IP address is set to the value 192.168.1.213 by the manufacturer. If you changed it and forgot the new IP address, run the Tx5xx_setup program and press the “Find...” button. In a new window all sensors will be show.

It is not possible to connect to the device from a LAN

In the “Find device” window is only IP and MAC address displayed

The next informations are displayed as N/A. This problem will be occurred, when the device IP is set to another LAN.

In Tx5xx_Setup.exe program choose Tools/Change device IP.

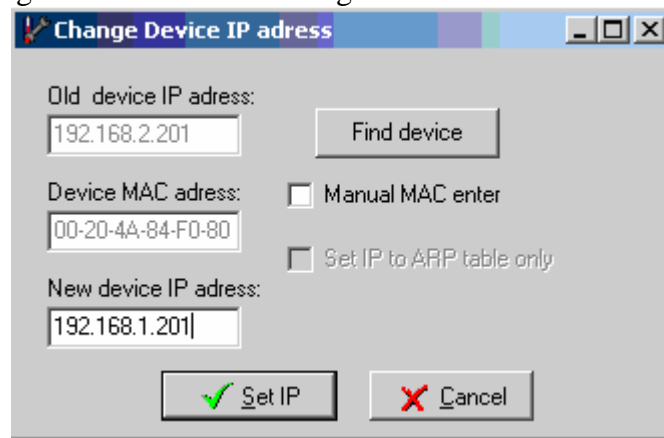


Figure 15- Change device IP address

Press the “Find device” button, in new created window select your unconnectable sensor. IP and MAC address will be displayed in Change Device IP address window. Enter the new sensor IP address to New device IP address field. Be ensure, that the new IP address is unused, and press the “Set IP” button.

The sensor IP address in Find device window is not displayed

In program Tx5xx_Setup. exe Select Tools/Change device IP. In change Device IP address (Fig. 15) select “Manual MAC enter”, to “Device MAC address” field enter the device MAC address in format xx-xx-xx-xx-xx-xx (e.g. 00-20-4A-84-F0-80) and press the “Set IP” button.

Finding the MAC address

The MAC address is a unique address of a device which is necessary to be known e.g. in case when there are several devices connected to the network. Procedure:

- disconnect the device power supply
- unscrew four screws holding the lid
- remove the lid
- there is a number in the format **00-20-xx-xx-xx-xx** on the network connector label below the bar code. This is the MAC address of the device which is necessary to be known if the device IP address is not known.

It is not possible to find meter after manual MAC enter

In program Tx5xx_Setup.exe menu select Tools/Change device IP. In this window (Fig. 15) select “Manual MAC enter” and “Set IP to ARP only”. To “Device MAC address” enter the meter MAC address (e.g. 00-20-4A-84-F0-80) and press the “Set IP” button.

Open telnet to the IP address you assigned to the device MAC address by running a telnet command telnet [IP_address_assigned_to_MAC_address] 9999 and confirm with the Enter key.

Example: telnet 192.168.1.254 9999 and Enter. After the welcome message

```
***** TRh-Sensor Setup 1-3-3.02 *****
MAC address 00204A872FB5
Software version VŁÄěő (050907) CPK_580_XPTEx
```

Press Enter for Setup Mode

press Enter. Choose 0- Global Settings, set the meters IP address, clear the gate IP, no. of net mask set to 0. Press the Enter key, until you are not back into a menu. Press 9 Save and Exit. The connection will be closed. Now you can connect to meter by the Tx5xx_setup program.

Display is off:

- check if the power is connected
- disconnect and connect the power - watch the display at the moment of connecting the power. If all LCD segments light for 1 second and go out again, the display is turned off by the software.

There is an Err 1 or Err 2 reading on the LCD:

- check if a temperature probe is connected or if the temperature probe is not at a temperature outside the measuring range (only T4511 temperature transducer)
- check the integrity of the probe cable (only T4511 temperature transducer)

Forgotten password to the setup:

- disconnect the power
- unscrew upper lid of the device case
- press the button inside the device and connect the power at the same time. Keep the button pressed
- keep the button pressed for 10 s - then the password will be erased
- close the device

Preventive maintenance

Pay heed to recommended calibration interval. Do not subject the device to mechanical stress.

Technical specification

Technical parameters:

Common parameters:

Power voltage: 9 to 30 V DC, maximum consumption 200 mA

Measuring interval: 0,5 s

Display refresh: 0,5 s

Communication with computer: Ethernet connection (RJ-45 connector)

Protection: IP30 - case with electronics

EMC: device complies EN 61326-1:

Devices are conformed EN 50081-1 and EN 50082-1 in the range:

Radiation:	EN 55022	class B
Immunity:	EN 61000-4-2	levels 4/8 kV, class A
	EN 61000-4-3	intensity of electromagnetic field 3 V/m, class A
	EN 61000-4-4	levels 1/0.5 kV, class A
	EN 61000-4-6	intensity of electromagnetic field 3 V/m, class A

Temperature and relative humidity meter T3511

Device protection: IP42

Temperature measuring range: -30 to +105 °C

Resolution of temperature: 0.1 °C

Accuracy of temperature measurement:

- ± 0,4 °C from -30 to +80 °C
- ± 0,5 °C over +80 °C

Time response to temperature step: $t_{90} < 6$ min, probe with sintered bronze filter, at temperature step 20 °C

Relative humidity measuring range: 0 to 100 %RH, temperature compensated

Relative humidity resolution: 0.1 %RH

Accuracy of relative humidity measurement: ± 2,5 %RH from 5 to 95 %RH at 23 °C

Time response to relative humidity step: $t_{90} < 60$ s, probe with bronze filter, at humidity step 60%, air flow approximately 0.5 m/s at constant temperature

Temperature and humidity measuring range is limited accordingly with graph below !(Figure 16)

Dew point: value is calculated from temperature and humidity

Range of dew point measurement: -60 to +105 °C

Dew point resolution: 0.1 °C

Accuracy of dew point measurement: ± 0,5 °C from 30 to 95 %RH

Temperature transducer T4511

Probe: Pt1000/3850 ppm, connected by shielded cable of 10m maximum length

Temperature measuring range: -200 to +600 °C

Temperature resolution: 0.1 °C

Accuracy of temperature measurement:

- ±0.2 °C from -100 to +100 °C
- ±0.2 % from reading outside of the above range

Operating conditions

Operating temperature range:

T3511: instrument -30 to +80 °C, probe -30 to +105 °C

T4511: instrument -30 to +80 °C, external probe - depends on probe model.

LCD display must be switched off at temperature over 70°C!

Operating temperature and humidity range:

electronics T3511, T4511: -30 to +80 °C, 0 to 99 % RH (not condensing)

probe T3511: -30 to +105 °C, 0 to 100 %RH

LCD display must be switched off at temperature over 70°C!

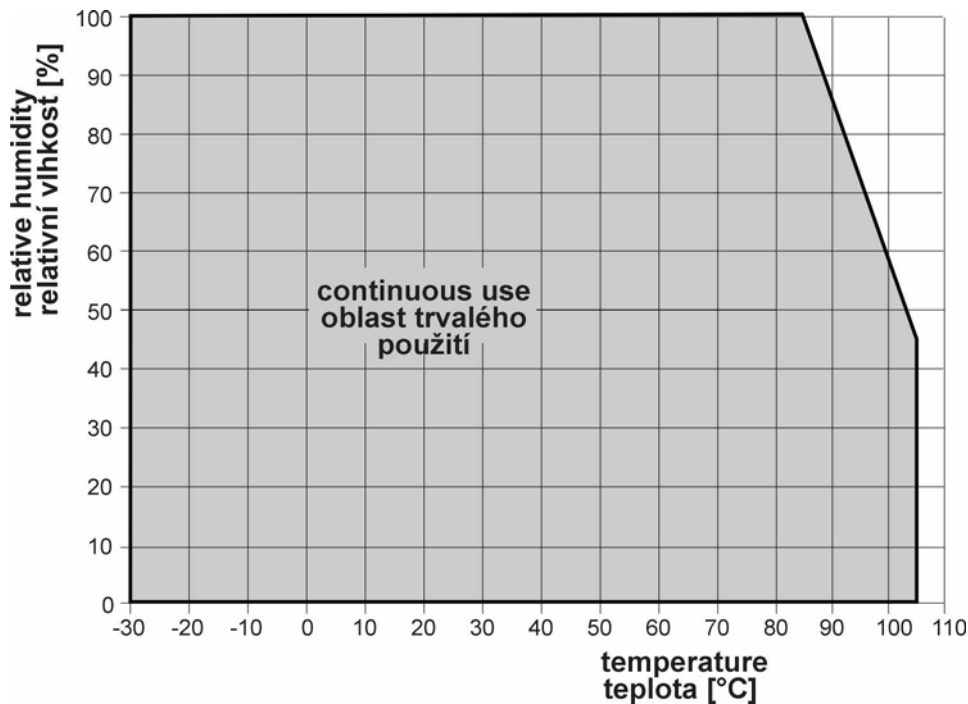


Figure 16 – operating range T3511

Outer characteristics in accordance with EN 33-2000-3:

Normal environment with the specifications: AE1, AN1, AR1, BE1

Working position: arbitrary

Installation of the instrument: by means of two holes at the bottom part

Not allowed manipulations:

It is not allowed to operate the device under conditions other than specified in technical parameters. Devices are not designed for locations with chemically aggressive environment. Temperature and humidity sensors must not be exposed to direct contact with water or other liquids. It is not allowed to remove the sensor cover—to avoid any mechanical damage of the sensors.

Limits on conditions (the device without a probe): temperature -40 to +80 °C, humidity 0 to 99 %RH

Mechanical dimensions of the case (W x H x D): 88 x 98 x 36 mm

Mechanical dimensions of the external probe: Ø18 mm, length approximately 90 mm, standard cable length 1 m

Weight: approximately 240 g

Material of the case: ABS

Liquidation: Device itself (after its life) is necessary to liquidate ecologically!

Access to variables by means of protocols

Variable	Modbus	telnet	www	snmp	configuration SW	variable	modbus	telnet	www	snmp	configuration SW
global setting:						measurement:					
password for telnet		X			X	temperature	I		I	I	
IP address		X			X	relative humidity	I		I	I	
description of the device		X	I		X	dew point temperature	I		I	I	
logging interval for history		X	I		X						
history (t,rh,dp)			I	I		temperature lower limit	I	X	I	X	X
sending of emails/traps		X			X	temperature upper limit	I	X	I	X	X
						humidity lower limit	I	X	I	X	X
smtp:						humidity upper limit	I	X	I	X	X
smtp server-email ip		X			X	dew point lower limit	I	X	I	X	X
e-mail1 - recipient address		X			X	dew point upper limit	I	X	I	X	X
e-mail2 - recipient address		X			X	lower alarm for temperature	I	X	I	X	X
e-mail3 - recipient address		X			X	upper alarm for temperature	I	X	I	X	X
						hysteresis for T	I	X	I	X	X
modbus mode:						tolerated exceeding time T	I	X	I	X	X
port 501		X			X	lower alarm for humidity	I	X	I	X	X
						upper alarm for humidity	I	X	I	X	X
mib:						hysteresis for RH	I	X	I	X	X
address for sending trap 1		X			X	tolerated exceeding time RH	I	X	I	X	X
address for sending trap 2		X			X	dew point lower alarm	I	X	I	X	X
address for sending trap 3		X			X	dew point upper alarm	I	X	I	X	X
						hysteresis for DP	I	X	I	X	X
www:						tolerated exceeding time DP	I	X	I	X	X
refresh interval of WWW		X	I		X						
						information on SW:					
						firmware version		I			
						device serial number			I		I

Legend:

X – read and write; I – only read;