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# TME multi

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Up to 32 smart sensors in one  
can read temperature, humidity and dew point

Web Interface, e-mail, HTTP GET,  
XML, Modbus, SNMP

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# TME multi

## Datasheet

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## Papouch s.r.o.

Address:

**Strasnicka 3164  
102 00 Prague 10  
Czech Republic**

Tel:

**+420 267 314 267**

Fax:

**+420 267 314 269**

Internet:

**[www.papouch.com](http://www.papouch.com)**

E-mail:

**[info@papouch.com](mailto:info@papouch.com)**



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## BASIC INFORMATION

### Description

TME multi is a completely **autonomous system** that communicates independently with sensors connected via the RS485 line and sends the obtained data to a remote server. No computer or any other superior system is needed to measure and send the obtained values.

TME multi can work **with temperature, humidity and dew point** read from the [TQS3](#) and [THT2](#) sensors. Through the website of the device it is easy to learn about the current temperature and humidity in your premises, storage areas, etc.

Do your customers want to know in what conditions you store their goods? TME multi is the ideal solution. You and your customers can check the current temperature at any time. In addition, you can set the limit values at which an e-mail will be sent to your address. It can be easily forwarded to a mobile phone as an SMS.

The measured values are sent as the **HTTP GET** form data; they are also available in the **XML** format or via the **Modbus TCP** and **SNMP** protocols. Thus, data can be easily integrated into your company's system.

All sensors can be easily configured and settings done via the web interface.

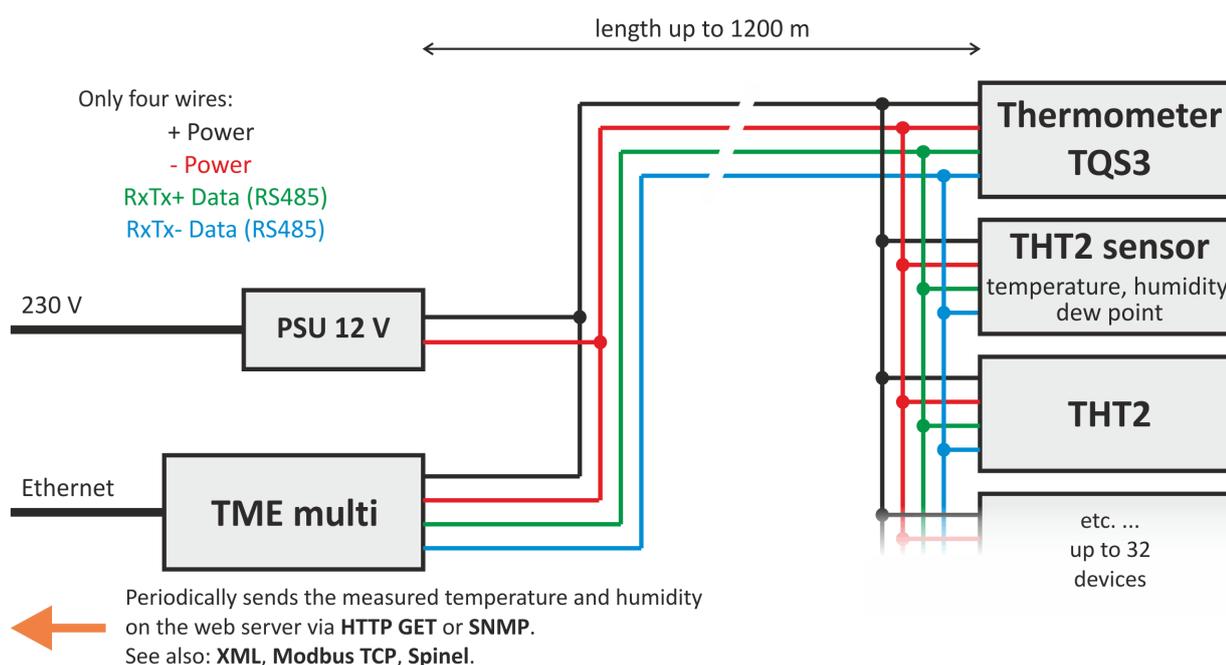


Fig. 1 – block diagram of system connection

The system can contain **up to 32 devices**. **Four wires** are sufficient to make the **connections**. The total cable length can be up to 1200m (may be extended using [CQ485](#) separator).

## Applications

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- measures temperature and humidity at multiple sites and displays them on the website
- monitors temperature and humidity and stores the values in a database on a web server

## Features

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- Possibility to connect up to 32 devices
- Possible to connect [TQS3 thermometers](#) and [THT2 sensors](#) (temperature, humidity and dew point)
- The devices can be connected by a cable of up to 1.2 km length. This feature can be used in larger systems.
- Data transmission via TCP/IP (10/100 Ethernet)
- Web page with an overview of current values
- Configuration via web interface
- Measured data sent to the server as an HTTP GET
- Current data in the XML format
- Automation protocols Modbus TCP and SNMP
- Sending e-mail when the threshold is exceeded
- Can be mounted on the DIN rail

## Communication options of TME multi

### 1) Internal website<sup>1</sup>

After entering the IP address of TME multi into the Web browser<sup>2</sup>, a website opens with current data from the connected sensors. By default, the website is available on the IP address <http://192.168.1.254/>.

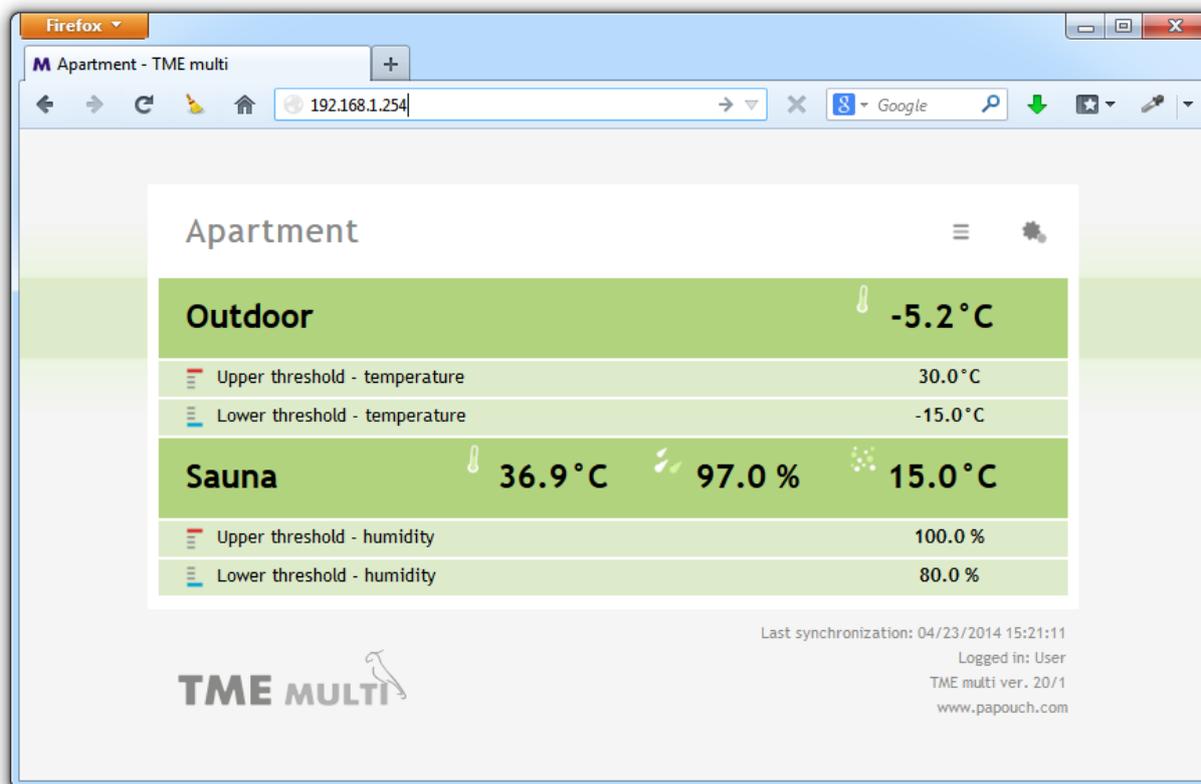


Fig. 2 – Internal website

### 2) XML file<sup>1</sup>

An XML file with the current values of all sensors is available at [http://\[IP\\_device\\_address\]/fresh.xml](http://[IP_device_address]/fresh.xml). The following figure shows an example for TME multi with one TQS3 and one THT2 sensor:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<root xmlns="http://www.papouch.com/xml/tmemultiradio/act">
  <sns id="1" vc="199" name="Za oknem" watch="1" max="300" min="-150"
    s1="0" v1="-52" s2="0" v2="123" s3="0" v3="123" />
  <sns id="3" vc="523" name="Sauna" watch="2" max="1000" min="800"
    s1="0" v1="307" s2="0" v2="970" s3="0" v3="150" />
  <status unit="C" location="U Papoucha" />
</root>
```

id ..... Identification number of the sensor (automatically assigned address).

vc ..... Sensor type as number: TQS3 (199), THT2 (523), THT2 I (1011), TMW (740), THW (1041)

<sup>1</sup> This feature is only available in the WEB mode.

<sup>2</sup> Optimized for Internet Explorer 8.0, Mozilla Firefox, Google Chrome, Opera and Safari. The Internet browser must support JavaScript.

name...Sensor name.

watch ..ID of monitored value (0 = none; 1 = temperature; 2 = humidity; 3 = dew point).

max.....The maximum limit as an integer. The resulting value is obtained by dividing this number by ten.

min.....The minimum limit as an integer. The resulting value is obtained by dividing this number by ten.

s1.....The first variable is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

v1.....The first variable as an integer; should be divided by ten to obtain the real value.

s2.....The second variable is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

v2.....The second variable as an integer; should be divided by ten to get the real value.

s3.....The third variable is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

v3.....The third variable as an integer; should be divided by ten to obtain the real value.

### 3) Adding temperature on the Website using a script (HTTP GET) <sup>1</sup>

TME multi is able to periodically call a script (e.g. PHP) on a specified address – for example on a web server and to transmit temperature to it just like form parameters (e.g. a HTTP GET request). TME multi sends a separate GET for each connected sensor. Example:

```
skript.php?mac=0080A3994D27&mod=2&type=199&name=Venku&tempS=0&tempV=12.3&
humS=1&humV=0&dewS=1&dewV=0&watch=1&max=25.5&min=20.1&hyst=0.1
```

mac.....MAC address of TME multi.

mod.....Identification number of the sensor (automatically assigned address).

type.....Sensor type as number: TQS3 (199), THT2 (523), THT2 I (1011), TMW (740), THW (1041)

name...Sensor name

tempS..Temperature is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

tempV..Temperature as a decimal number in degrees Celsius.

humS ..Humidity is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

humV ..Humidity as a decimal number in percent form.

dewS...The dew point is: 0 = OK, 1 = waiting for the first measurement, 2 = below the lower limit; 3 = above the upper limit; 4 = error

dewV...Dew point as a decimal number in degrees Celsius.

watch ..ID of monitored value (0 = none; 1 = temperature; 2 = humidity; 3 = dew point).

max.....The maximum limit as a decimal number.

min ..... The minimum limit as a decimal number.

hyst .... Hysteresis as a decimal number.

#### 4) SNMP protocol<sup>1</sup>

SNMP is used for central administration and monitoring of hardware and technologies. Depending on the settings, TME multi sends SNMP traps when the measured value on one of the sensors is outside the set limits. It can also periodically send traps with the measured values. This is useful e.g. for storing the measured values into the database. *(For more information, see page 19.)*

#### 5) Modbus TCP<sup>1</sup>

Modbus is a standard automation protocol. Its network version (TCP) is implemented in the device. *(For more information, see page 19.)*

#### 6) E-mail<sup>1</sup>

TME multi can send an e-mail if the set limits are exceeded. The e-mail can also be sent periodically to get a better picture of the current state of measurement.

#### 7) TCP/UDP protocol<sup>3</sup>

TME multi can function as an intermediary for communication with the connected sensors. It is possible to connect to TME multi as a TCP server and communicate via an open data channel using the Spinel protocol. It is also possible to communicate using UDP. *(For more information, see page 14.)*

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<sup>3</sup> In this mode, only communication via TCP or UDP is available, according to the setting. No other functions are available. It is thus impossible to monitor the current values via the web interface, send e-mails and GET and POST requests, or communicate via SNMP.

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## Communication modes

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TME multi can operate in one of the following modes:

### WEB

(This mode is as default by the manufacturer.)

In the WEB mode, TME multi can display the current measurements on the website or via XML file, can monitor the measured values and send e-mails on the basis of the results, can send HTTP GET and communicate via SNMP and Modbus protocols.

In this mode it is not possible to communicate directly with the connected sensors by the Spinel protocol over TCP or UDP.

### TCP server

In the **TCP server** mode, TME multi waits for a connection on the data port. After the connection has been made, the data channel is routed through the device to the serial line RS485. Thus it is possible to communicate via Spinel protocol individually with all connected devices. Therefore, the device acts as Ethernet - RS485 converter.

*In this mode, communication is available only via Spinel.* No other functions are available. It is thus impossible to monitor the current values via the web interface, send e-mails and HTTP GET requests or to communicate via SNMP or Modbus.

### UDP

In the **UDP** mode, the data from TME multi are routed to the device with an IP address according to the settings or without routing to a specific address if the broadcast address of your network (so-called "UDP broadcast") is set as the remote address. After the connection has been made, the data channel is routed through the device to the serial line RS485. Thus it is possible to communicate via Spinel protocol individually with all connected devices. Therefore, the device acts as Ethernet - RS485 converter.

*In this mode, communication is available only via Spinel.* No other functions are available. It is thus impossible to monitor the current values via the web interface, send e-mails and HTTP GET requests or to communicate via SNMP or Modbus.

## CONNECTIONS

The measuring system consists of the following parts:

- 1pc..... TME multi
- 1pc..... 12V supply unit
- < 32pcs ..... Sensor (thermometer TQS3 or sensor THT2).
- < 1200 m... connecting cable between TME multi and the sensors.
- 1pc ..... non-crossover cable (TP cable) for connecting TME multi to PC network.

To work properly, the system also needs 230 V power supply (one socket for 12 V supply unit) and connection to a computer network (one socket 10/100 Ethernet RJ45).

System connections are illustrated in the figure below. More detailed information is provided later in this document.

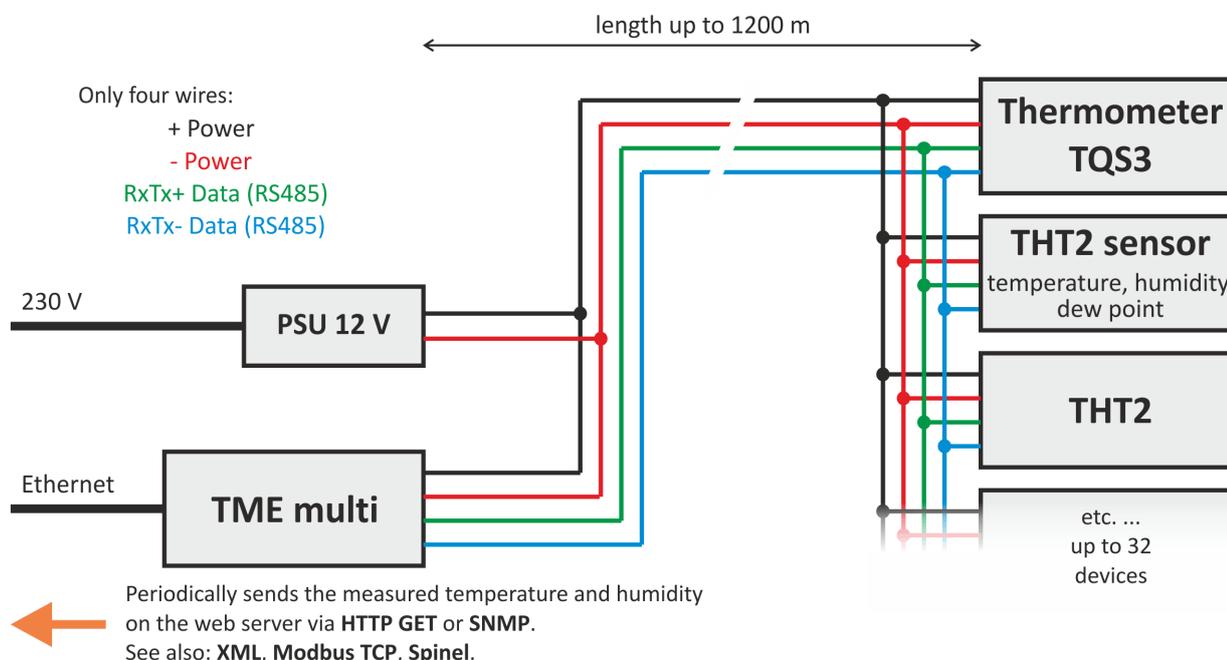


Fig. 3 – system connections

### Wiring procedure:

- 1) Deploy the sensors, TME multi and the 12V power supply and install the connecting cable - it is recommended to use a standard cable that is used in computer networks (UTP cable). It contains four pairs of twisted wires.

One pair to be used as data lines. One wire shall be **RxTx+**, the other **RxTx-**.

Second pair: connect the two wires and use them for the positive pole of the 12 V supply unit (**PWR**).

Third pair: Connect the two wires and use them as the ground connection (**GND**).

Fourth pair: Leave unconnected. May be used in the future.

Install the cable as shown below - i.e. gradually interconnect the individual modules. The total length of the connecting cable can be up to 1200 meters.

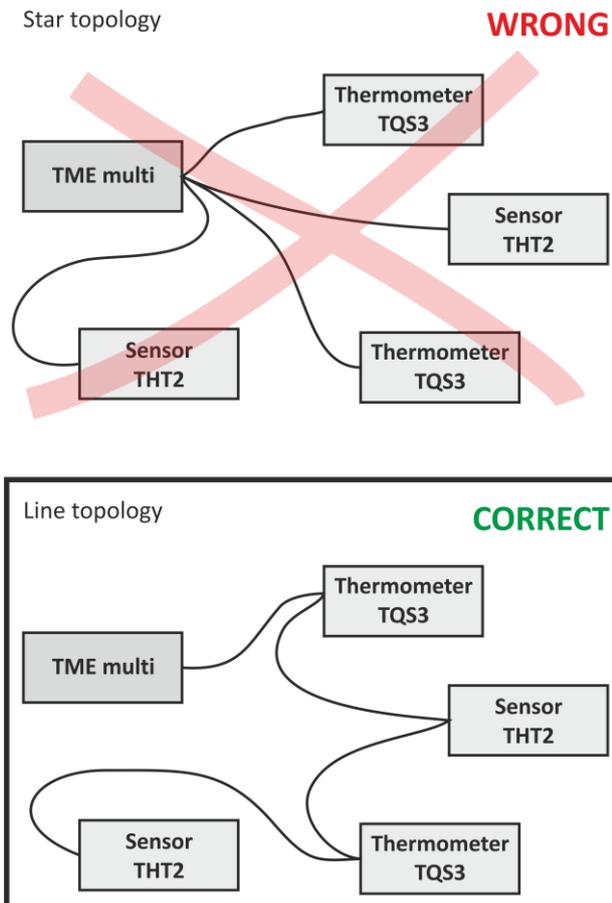


Fig. 4 – correct connection of the system

An example of connection is shown below. Connect your system in a similar manner.  
 Note: All modules in the system have built-in protection against reverse polarity.

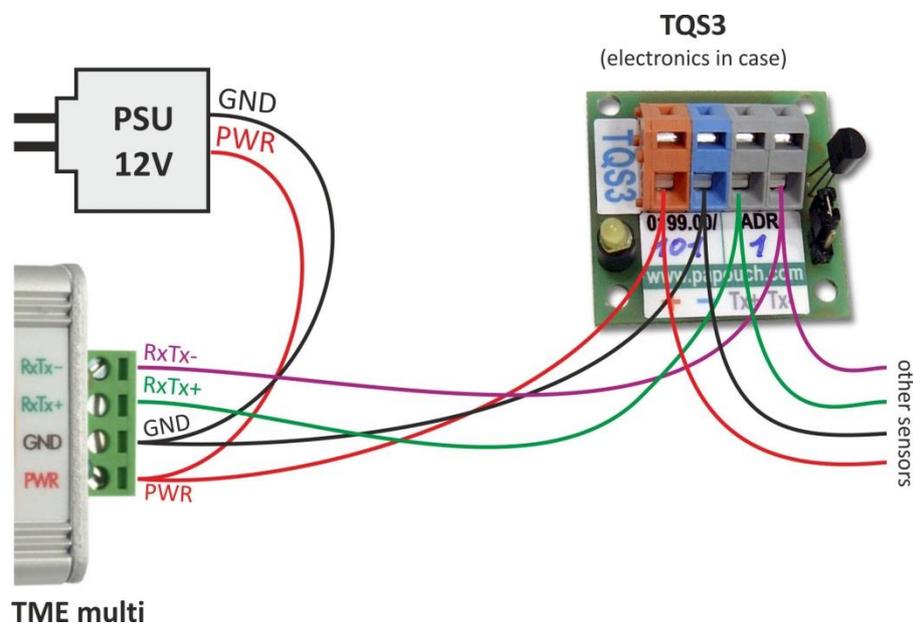


Fig. 5 – example of connection

- 2) Connect the 12 V supply unit into 230 V.
- 3) Connect TME multi into the computer network using a non-crossover cable (TP cable).
- 4) The wiring is done now. Proceed with the following chapter Configuration.

## CONFIGURATION

The device has a default IP address of 192.168.1.254 set by the manufacturer. If your network has a different range of addresses, it is not possible to connect to the device in a standard way.

Therefore, ask your network administrator for an IP address, subnet mask and gateway IP address that are suitable for the device. Then connect your device to your network and run the Ethernet Configurator on any PC in the same network. (The software can be downloaded for free from [papouch.com](http://papouch.com))

Assign new network parameters to the device according to the following procedure:

- 1) Connect the device and turn it on.
- 2) Run EthernetConfigurator.exe

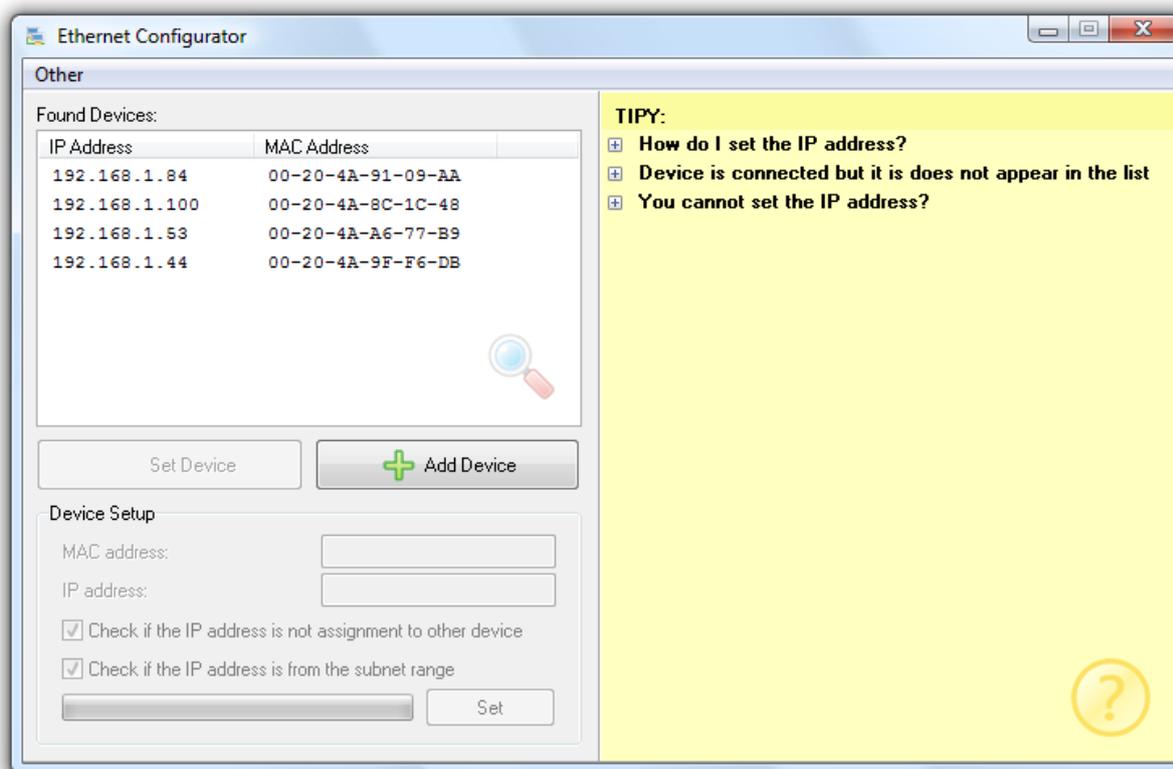


Fig. 6 – main window of EthernetConfigurator

- 3) A window that is shown in Fig. 6 will appear. (Your device will probably NOT be visible in the list of found devices on the left, if your network does not have the same range as the device.)
- 4) Click the *Add Device* button to access the *MAC Address* and *IP Address* field. Copy the address indicated on the label into the *MAC Address* field. The text on the label will be similar to this: *MAC: 00-20-4A-B4-34-5D*
- 5) Type the IP address you receive from your network administrator into the *IP Address* field. Then click *Set*. After a moment, a window appears to confirm that the setting was successful and the device will appear in the list of found devices.
- 6) Continue by opening the website according to the instructions below.

## SETTINGS

To configure TME multi, use the dedicated **Web interface**. Network settings can also be made using the **Telnet** protocol (see page 14). For the initial configuration of the IP address use the **Ethernet Configurator** (described on the previous page).

## SETTING VIA WEB INTERFACE

To access the settings, use the button in the top right corner of main web page of TME multi.



Fig. 7 – button to enter the settings on the main page

Settings are arranged in eight panels:

- *Network* – to set the network interface, IP address, subnet mask, DNS server, mode, ...
- *Security* – to set passwords for access to the site
- *E-mails* – recipient, authorization, configuration test
- *SNMP*
- *Sending* – to send values to your server using HTTP GET
- *Sensors* – administration of connected sensors
- *Other* – to set the device name and the language of the web interface
- *Info* – information about the device

### Tips for working with settings:

- The default language of the website is English. The language of the website can be switched to Czech in panel *Other*, parameter *Language*.
- Help is displayed automatically when you place your mouse cursor over the relevant field. (It is also displayed when you move the mouse over a heading marked with a question mark.)

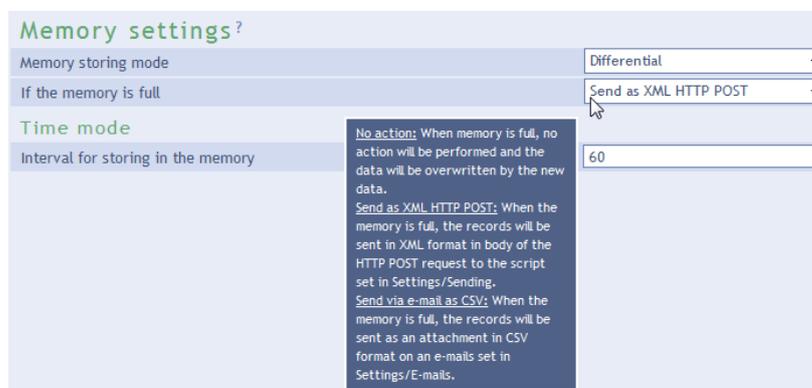


Fig. 8 – open help window

- Settings window can be moved by dragging the upper right corner.
- Settings can also be opened by pressing S when the browser window is active.
- Settings can be closed by pressing Esc when the browser window is active.

## TELNET CONFIGURATION

### Connection

#### Unknown IP address

*For setting the IP address we recommend using Ethernet Configurator (more on page 12).*

- 1) Open a window with command prompt (In Windows OS, click *Run* and type `cmd`.)
- 2) Make a record to ARP table:
  - a. Type `arp -d` and confirm by Enter. That deletes current ARP table.
  - b. Following command assigns IP address to MAC address:  
`arp -s [new_ip_address] [MAC_address]`  
example: `arp -s 192.168.1.254 00-20-4a-80-65-6e`
- 3) Open Telnet. ( by typing `telnet` and pressing Enter. <sup>4)</sup>
- 4) Type `open [new_ip_address] 1` and confirm.
- 5) Terminal shows an error message after a moment. Nevertheless this action is essential for correct IP address ARP entry.
- 6) Connect to the IP address of the TME multi. (by typing `open [IP address in dot format] 9999` and Enter.)
- 7) Now you have entered to the configuration of the Module. IP address is not yet set. It needs to be set in menu `Server Configuration > IP Address`.
- 8) If the IP address is valid, TME multi writes welcoming information ending by text:  
**Press Enter for Setup Mode**  
Now press Enter or the configuration will be terminated.
- 9) Device writes complete settings.
- 10) At the end of the entry you can see „Change setup:” text containing groups of parameters that are configurable. For changing the network parameters choose *Server*. Here you can set a new IP address and other parameters.

---

<sup>4</sup> Telnet client is not standard installed in OS Windows Vista, 7 and 8. You can install it by doing following:

- a) Open Control panel/add or remove programs.
- b) On the left, click on Add/remove Windows functions (You have to have administrator's rights to do this.)
- c) Windows Functions window will open. Check “Telnet client” and confirm. Telnet client will be installed to your system.

## IP address is known

- 1) In OS Windows click on Start/Run and type `telnet` and confirm.<sup>4</sup>
- 2) Connect to the IP address of the TME multi. (by typing `open [IP address in dot format] 9999` and Enter.)
- 3) If the IP address is valid, TME multi writes welcoming information ending by text:  
**Press Enter for Setup Mode**  
Now press Enter or the configuration will be terminated.
- 4) Device writes complete settings.
- 5) At the end of the entry you can see „Change setup:" text containing groups of parameters that are configurable. For changing the network parameters choose Server.

## Telnet main menu

You can choose the menu items by pressing the number before them and confirming by Enter.

Menu structure is:

```
Change Setup:
  0 Server
  ...
  7 Defaults
  8 Exit without save
  9 Save and exit          Your choice ?
```

## Server

Basic Ethernet settings.

Following items are in this part:

```
IP Address : (192) .(168) .(001) .(122)
Set Gateway IP Address (N) ?
Netmask: Number of Bits for Host Part (0=default) (16)
Change telnet config password (N) ?
```

**IP Address**

TME's IP address. Enter the numbers separately and divide them by Enter.

Default: 192.168.1.254

**Set Gateway IP Address****Gateway IP address**

Type "Y" in the "Set Gateway IP Address" item to change the address. Enter the numbers separately and divide them by Enter.

**Netmask**

You can set here how many bits from IP address make the network part.

Subnet mask is entered as a number of bits determining range of possible IP addresses of the local network. If for example 2 is entered, subnet mask is 255.255.255.252. Entered value indicates number of bits from right. Maximum is 32.

Default: 8

Example:

Mask 255.255.255.0 (binary 11111111 11111111 11111111 00000000) -> number 8.

Mask 255.255.255.252 (binary 11111111 11111111 11111111 11111100) -> number 2.

**Change telnet config password****Enter new Password**

This item sets the password that is required before entering the Telnet configuration or via WEB interface (Administrator's password).

Type "Y" at „Change telnet config password“ to change the password

**Factory Defaults**

By pressing number 7 you can set the device to factory defaults.

This option sets the TH2E to defaults. IP address does not change, WEB port number will be changed to 80.

**Exit without save**

Ends the telnet session without saving.

**Save and exit**

This choice saves the changes. If some settings are changed, device restarts. That may take up to 30 seconds.

## CONNECTION VIA TCP – WEB MODE

In the WEB<sup>5</sup> mode, TME multi can work as a TCP server waiting for a connection on a configured port (setup: *Network/Port for Spinel*). This mode is useful when a remote system requests the measured values and actively connects to TME multi.

TME multi acts as a server and waits for a connection request on its own IP address and data port. When the connection is made, every 10 seconds it sends information about the measured values in a format compatible with Spinel protocol. One message is sent for each connected sensor – thus 1 to 32 messages can be sent every 10 sec according to the number of sensors.

### Message format

Below is a description of the data portion of the packet in Spinel (example on the next page):

*Acknowledgement code:* ACK 0EH

*Parameters:* (id)(typ1)(status1)(value1) (typ2)(status2)(value2) (typ3)(status3)(value3)

id	Identifier of the variable	length: 1 byte
Identifier of the sensor – number from 1 to 32.		
typeX	Type of the variable	length: 1 byte
Identifies the variable to which the following three bytes apply. Can have the following values: 01H → Temperature, 02H → Humidity, 03H → Dew point		
statusX	Status of the measured value	length: 1 byte
Information on the status of the measured variable. It can have the following values: 0 ... value is valid 1 ... value has not been measured yet 2 ... value above the upper limit 3 ... value below the lower limit 4 ... error		
valueX	value	length: 2 bytes
The current measured value as 16-bit signed integer (signed int) <sup>6</sup> multiplied by ten. The bytes are in the order MSB:LSB. The current value with an accuracy of one decimal place can be obtained as follows: $\text{current\_value} = \text{value} / 10$		

<sup>5</sup> The WEB mode is the default working mode of TME multi. The mode can be changed in the *Network* panel.

<sup>6</sup> Negative numbers are expressed as two's complement. Two's complement is a method of encoding negative numbers in the binary system. The absolute value of a negative number can be obtained as follows::

Number (two's complement)... FFC6H

Subtract one ..... FFC6H – 1 = FFC5H

Negate the result ..... FFC5H → 003AH, which is 58 in decimal

**Examples:****Automatic message:**

```
2AH, 61H, 00H, 12H, 31H, 00H, 0EH, 01H, 01H, 00H, 01H, 06H, 02H, 00H, 01H, 80H, 03H, 00H, 00H, 6DH, 27H, 0DH
```

The measured values are: temperature 26.2 °C and humidity 38.4 %. The dew point is 10.9 °C.

Here is the description of the highlighted bytes:

0EH → to show that it is an automatically sent message.

01H → Temperature:

80H → the value is valid and within the range

01H,06H → 0106H → 262 → divide by ten → 26.2 °C

02H → Humidity:

80H → the value is valid and within the range

01H,80H → 0180H → 384 → divide by ten → 38.4 %

03H → Dew point:

80H → the value is valid and within the range

00H,6DH → 006DH → 109 → divide by ten → 10.9 °C

**CONNECTION VIA TCP – TCP AND UDP MODES**

In the TCP server, TCP client and UDP modes, TME multi communicates via Spinel. It is a standard request-response protocol that is used by all the devices of our company.

This protocol can be used to communicate with the connected sensors through TME multi, just like via a standard Ethernet to RS485 converter.

## SNMP

### SNMP objects – variables

---

The following objects are available for each of the connected sensors. Thus, the last number of each id can take values from 1 to 32.

#### Sensor type

*Name:* inSnsType

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.1.1 - 32

*Description:* Sensor type as number: TQS3 (199), THT2 (523), THT2 I (1011), TMW (740), THW (1041)

#### Sensor name

*Name:* inSnsName

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.2.1 - 32

*Description:* Name of sensor – description of the location, etc.

#### Temperature status

*Name:* inTempStatus

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.3.1 - 32

*Description:* Status of the measured temperature. Can have one of these values:

- 0 → The value is valid and within the limits.
- 1 → The value has not been measured yet.
- 2 → The value is valid and exceeded the upper limit.
- 3 → The value is valid and is below the lower limit.
- 4 → The value is not valid – measurement error.

#### Humidity status

*Name:* inHumStatus

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.4.1 - 32

*Description:* Status of the measured humidity. Can have one of these values:

- 0 → The value is valid and within the limits.
- 1 → The value has not been measured yet.
- 2 → The value is valid and exceeded the upper limit.
- 3 → The value is valid and is below the lower limit.
- 4 → The value is not valid – measurement error.

#### Dew point status

*Name:* inDewStatus

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.5.1 - 32

*Description:* Status of the calculated dew point. Can have one of these values:

- 0 → The value is valid and within the limits.
- 1 → The value has not been calculated yet.
- 2 → The value is valid and exceeded the upper limit.

3 → The value is valid and is below the lower limit.

4 → The value is not valid – measurement error.

### Measured temperature

*Name:* inTempValue

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.6.1 - 32

*Description:* The measured value as an integer. To get the actual value, divide by ten.

### Measured humidity

*Name:* inHumValue

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.7.1 - 32

*Description:* The measured value as an integer. To get the actual value, divide by ten.

### Calculated dew point

*Name:* inDewValue

*Object ID:* 1.3.6.1.4.1.18248.30.2.2.1.1.8.1 - 32

*Description:* The measured value as an integer. To get the actual value, divide by ten.

## SNMP objects – general

---

The following objects are related to the whole device.

### Device name

*Name:* deviceName

*Object ID:* 1.3.6.1.4.1.18248.30.2.1.1.0

*Description:* Device name defined by the user.

### Alarm text

*Name:* psAlarmString

*Object ID:* 1.3.6.1.4.1.18248.30.2.1.2.0

*Description:* The text of the alarm message that is sent when the pre-set limits are exceeded.

## Automatic messages – traps

TME multi allows you to send automatic messages (SNMP traps). Two settings are related to the traps, i.e. permission to send traps and the IP address of the recipient (so called SNMP administrator or manager).

Traps are sent (depending on the settings) if any of the monitored parameters exceed the pre-set limits.

Traps with current values can be sent periodically, depending on the setting.

### Trap 1 – Value is outside the limits

The trap contains the measured value and the limit that was exceeded.

The trap is only sent when one of the limits has been exceeded. The trap can only be delivered to a properly configured IP address.

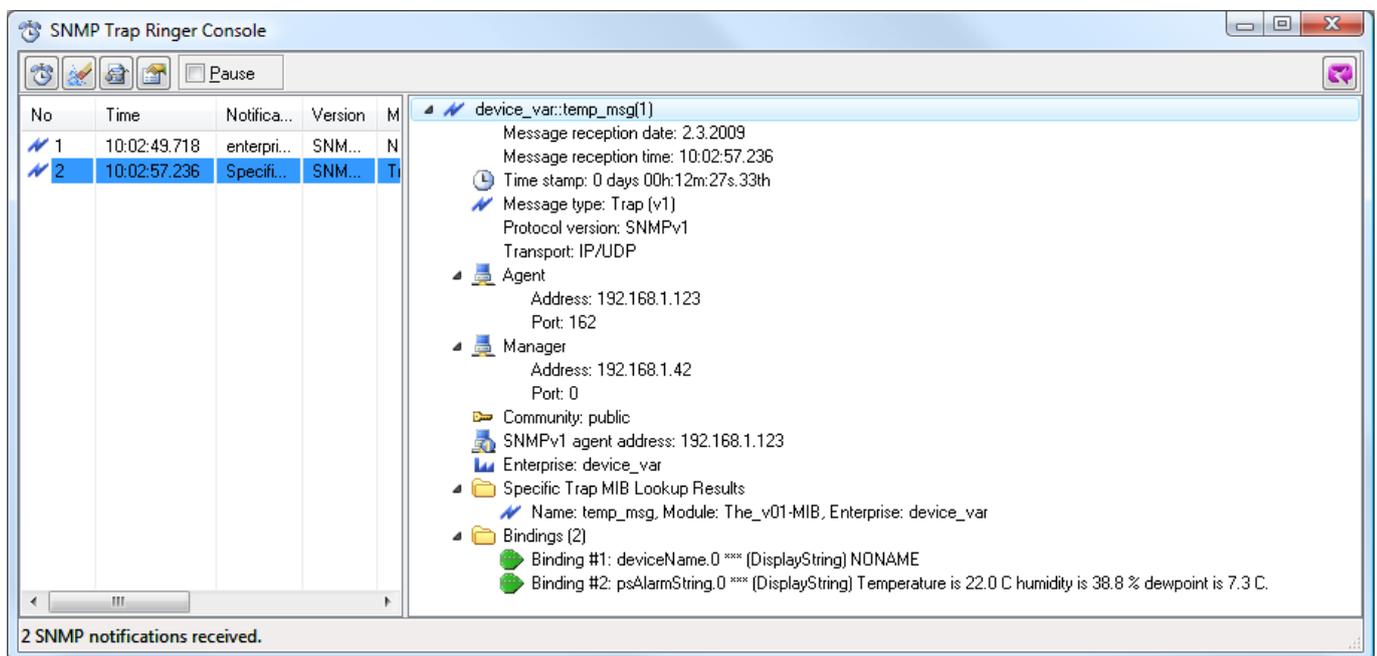


Fig. 9 – SNMP trap indicating an exceeded pre-set limit

### Trap 2 – Current measurements

The trap contains all current values as well as the name of the device set by the user.

The trap is sent only if a non-zero frequency of sending has been set.

## MODBUS TCP

### List of instructions

The device enables access to its memory – depending on the register type – by these instructions:

- 0x04 .....Read input register

You can read up to 60 registers at a time. Before reading more registers, you must wait for a response or timeout.

### Input Register

Address	Access	Function	Name
<b>1. sensor</b>			
0	read	0x04	<b>Temperature status</b> A number representing the current state of the converter: <ul style="list-style-type: none"> <li>• 0 ... Everything is OK</li> <li>• 1 ... Waiting for initialization</li> <li>• 2 ... Value above the upper limit</li> <li>• 3 ... Value below the lower limit</li> <li>• 4 ... Error</li> </ul>
1	read	0x04	<b>Temperature value</b> Temperature in degrees Celsius as an integer. To obtain the actual temperature, divide this value by ten.
2	read	0x04	<b>Humidity status</b> A number representing the current state of the converter: <ul style="list-style-type: none"> <li>• 0 ... Everything is OK</li> <li>• 1 ... Waiting for initialization</li> <li>• 2 ... Value above the upper limit</li> <li>• 3 ... Value below the lower limit</li> <li>• 4 ... Error</li> </ul>
3	read	0x04	<b>Humidity value</b> Humidity as an integer. To obtain the actual humidity, divide this value by ten.
4	read	0x04	<b>Dew point status</b> A number representing the current state of the converter: <ul style="list-style-type: none"> <li>• 0 ... Everything is OK</li> <li>• 1 ... Waiting for initialization</li> <li>• 2 ... Value above the upper limit</li> <li>• 3 ... Value below the lower limit</li> <li>• 4 ... Error</li> </ul>
5	read	0x04	<b>Dew point value</b> Dew point as an integer. To obtain the actual dew point temperature in degrees Celsius, divide this value by ten.
<b>2nd sensor</b>			
6 to 11			
<b>Other sensors...</b>			

---

<i>Address</i>	<i>Access</i>	<i>Function</i>	<i>Name</i>
<b>1. sensor</b>			
from 12			

## INDICATIONS

Two LEDs are located on the side of the device next to the green terminal box:

Green LED: (left) indicates that the device is connected to the supply voltage.

Yellow LED: (right) lights when a connection is established via a TCP data channel (off in the WEB mode).



Fig. 10 – LEDs

The Ethernet connector contains two additional LEDs that indicate the status of the network connection:

LNK (left)

No light ..... not connected

Yellow ..... connected at 10Mbps

Green ..... connected at 100Mbps

ACT (right)

No light ..... no communication

Yellow ..... Half-Duplex communication

Green ..... Full-Duplex communication

## RESET

Follow the instructions below to restore the default configuration set by the manufacturer. Unlike in the case of reset performed via the web interface (see page 13) or using the Telnet protocol (see page 14), the IP address is also reset to the default value of 192.168.1.254.

- 1) Disconnect the power supply.
- 2) Press the button located in a small hole under the Ethernet connector.
- 3) Connect the power supply and wait for 10 seconds.
- 4) Release the button.
- 5) Hard reset has been completed.

## TECHNICAL PARAMETERS

### Ethernet interface

Ethernet connection.....	RJ45 Ethernet 10/100BASE-T
Interface compatibility .....	Ethernet version 2.0/IEEE 802.3
Default IP address .....	192.168.1.254
Default network mask .....	255.255.255.0
Default IP address of the gateway .....	0.0.0.0
Telnet port .....	9999

### Communication line

Type.....	RS485
RS485 connector .....	terminal block
RS485 maximum length .....	1200 m
Maximum number of connected devices .....	31
Used signals of RS485 .....	RxTx+, RxTx-
Resistors defining the idle state of RS485.....	10 k $\Omega$

### Other parameters

Supply voltage .....	5 to 30 V (with reverse polarity protection)
Power consumption .....	typically 80 mA at 12 V
Weight .....	60 g
Degree of protection .....	IP30
Operating temperature.....	-25 to +70 °C
Dimensions.....	54 (63) mm × 24 mm × 33 mm

## Available designs

### Holder:

- No holder (*standard design*)
- With a DIN rail holder



Fig. 11 – Design with holder for DIN 35 mm rail

Should you have any specific requirements for the design and functions of TME multi, do not hesitate to contact us.





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Address:

**Strasnicka 3164  
102 00 Prague 10  
Czech Republic**

Tel:

**+420 267 314 267**

Fax:

**+420 267 314 269**

Internet:

**[www.papouch.com](http://www.papouch.com)**

E-mail:

**[info@papouch.com](mailto:info@papouch.com)**

