Web Sensors
Monitoring of temperature, humidity, atm. pressure and CO₂ via Ethernet

- Web Sensors of temperature, humidity, atmospheric pressure and CO₂ with two-state inputs and relay outputs
- High quality, accurate and stable sensors
- Values computed from ambient temperature and relative humidity
- Traceable calibration certificate in accordance with EN ISO/IEC 17025
These days there is a high demand for on-line monitoring and uninterruptable records of different types of values. With very fast development of computer technologies, it is still easier and easier to connect different kinds of monitoring devices directly to Ethernet lines, to the places where it was not possible before. If the Ethernet net has direct connection to the internet, then all data could be sent immediately around the world without the need for any additional costs. This high requirements could be done easily by Web Sensors and sensors with Ethernet output which can ensure long term reliability, stable parameters and very easy installation and usage. The devices can be protected against blackouts and data loss at the customer’s site. Of course PoE supply is an option.

Continuous monitoring of critical parameters such as temperature and relative humidity can be very easily done by the help of Web Sensors. This production line consists of sensors for measuring temperature, relative humidity, CO₂ concentration, atmospheric pressure, and the 4-20mA signal. Most sensors are equipped with an LCD display and can be easily incorporated into the existing network infrastructure.

The Web Sensors evaluate the measured values and in case of exceeding the alarm limits, the unit will send an email to a pre-set address, so this ensures that you are always informed of the conditions in your offices, server rooms, warehouses and factories, and everywhere where is necessary to monitor the supported values.

By connecting directly to a computer network the thermometer or humidity meter can be integrated into the control systems of different manufacturers using SNMP, MODBUS TCP, SOAP, syslog. Of course data in many formats is also available, for example XML and so on.

**Applications of Web Sensors:**
- Server rooms
- Offices and residential premises
- Building management
- Storage of food and drugs
- Museums and galleries
- Technological processes and production
- Industry

**Measured values:**

**Temperature**
Temperature is measured by RTD sensor Pt1000/3850 ppm which can be integrated into the housing of transducer, into the duct stem or can be used on the cable as well. The measured temperature can be displayed in °C or °F, according to the settings of the sensor.

**Relative humidity**
State-of-the-art capacitive polymer sensor ensures excellent long term calibration stability and inertia against water and condensation. Transmitters are available in wall-mount, duct mount.

**Barometric pressure**
Transmitter for measuring of barometric pressure is equipped with an absolute pressure sensor of high accuracy which ensures excellent long term stability. The display reading and pressure output is user selectable in these units: hPa, kPa, mbar, mmHg, inHg, inH2O, PSI, oz/in².

**Carbon dioxide level - CO₂**
A multiple point CO₂ and temperature adjustment procedure leads to excellent CO₂ measurement accuracy over the entire temperature working range; this is a must for process control and outdoor applications. The dual wavelength NDIR CO₂ sensing procedure compensates automatically for ageing effects. The CO₂ module is highly insensitive to pollution and offers maintenance free operation and outstanding long term stability.

**Current - mA**
Transfer of current loops 0-20 mA (4-20 mA) to the Ethernet network. Ethernet network reduces installation costs and accelerates deployment.

**Two - state inputs**
Selected devices feature up to three two - state inputs for connecting smoke detectors, floorings, breaking glass, door contacts, etc. A voltage-free contact, open collector or two-state voltage signal can be connected.

**Pharmaceuticals and laboratories**
Monitoring of areas and places for storage of drugs at temperatures down to - 200 °C.

**Technological processes and production**
Monitoring of storage conditions and production processes in the temperature range from - 200 °C to + 600 °C.
Web Sensors with Ethernet connection are designed to measure current 4 - 20mA (0-20mA), temperature, relative humidity, CO₂, and barometric pressure of air in non-aggressive environments. Measured values are according to device type. Devices with relative humidity measurement can show one of computed values: dew point temperature, absolute humidity, specific humidity, mixing ratio and specific enthalpy. Temperature units are °C or °F.

The visual indication of the CO₂ concentration is provided by three-colour LED.

Web Sensor of T-line is equipped with LCD display where current values can be displayed.

The device setup can be made by the TSensor software or web interface. TSensor software can be downloaded for free from the manufacturer’s website.

The latest version of firmware for your device with new features and even for older devices is available on the producer’s site www.cometsystem.com/support/firmware-update.

Common parameters of Web Sensors

WWW server
Actual measured values are accessible via powerful embedded web server. Web pages are ready for access from mobile devices like smartphones and tablets. Device configuration via web pages is possible too. Web Sensors allow to user customize the design of web pages.

History values memory
Graphs with history values are accessible via web pages. Modern HTML5 canvas graphic component allows to use graphs from thousands of devices. It is not a problem to show graphs on tablets or smartphones. All modern web browsers are supported - Firefox, Opera, Chrome or Internet Explorer 9.

Email
Warning emails are sent when measured value exceed selected limits. Emails are also sent when values return back into safe range. SMTP authentication is supported, but SSL not. Emails with CSV file attachment can be sent at selected intervals.

History export to CSV
History values can be exported for further processing by the CSV file. CSV file can be processed inside spreadsheet application like Microsoft Excel or OpenOffice Calc. CSV file can be downloaded from web pages or periodically sent as email attachment.

ModbusTCP protocol
Modbus protocol for communication with SCADA systems or third party software. Devices use Modbus TCP protocol version. Two Modbus clients can be connected to the device at one moment.

Actual values via XML
XML protocol for actual measured values reading. This protocol is suitable for Web Sensors integration into 3rd party SCADA systems.

SNMP protocol
SNMP version 1 protocol for IT infrastructure. Using SNMP protocol you can read actual measured values, alarm statuses and alarm parameters. Via SNMP protocol is also possible to get last 1000 measured values from the history table. MIB tables with OID description are available.

SNMP Trap
SNMP Trap for IT infrastructure. Web Sensors allow sending Traps to selected Trap receiver server. Traps are sent in case of alarm on channel or at error states like unable to send email, unable to deliver SOAP message, etc.

SOAP protocol
Web Sensors allow to send currently measured values via SOAP v1.1 protocol. The device sends values in XML format to the web server. The advantage of this protocol is that communication is initialized by the device side. Therefore it is not necessary to use port forwarding.

Syslog protocol
Syslog protocol for IT infrastructure monitoring systems. Web Sensors allow sending text messages to selected Syslog server. Messages are sent in case of alarm on channel or at error states like unable to send email, unable to deliver SOAP message, etc.

SNTP protocol - time synchronization
Time synchronization with SNTP server. Actual time is shown at web pages and is necessary for timestamps inside CSV files. Synchronisation interval can be set to one day or to one hour.

Web interface for the device setup

Current measured values and sensor settings can be accessed directly through the web interface from your web browser. TSensor software, which is available on our website in the section Software, can be also used for setting the sensor.

Sensor settings can also be done directly in a web browser in your PC, smartphone or tablet. All you need to do is enter the IP address of the sensor, open Settings and set up everything from communication to alarm e-mails.

Graphs of actual values can also be displayed through a Web browser. You can display up to one thousand measured values.

Current measured values are available on-line directly on a web browser from anywhere, all you need to do is enter the IP address. Alarms are indicated by a red field.

Minimum, maximum and alarm values together with a time stamp are recorded by the Event Log.

Current measured values and sensor settings can be accessed directly through the web interface from your web browser.
The Ethernet RJ45 connector for cable connection

Limits of LED indication may be changed by user.

Display for current measured values

Sensor cover with filter from stainless steel mesh. Filtering ability is 0.025mm

Common parameters:

- measured values - temperature, relative humidity, atmospheric pressure, CO₂, computed values
- highly accurate and stable sensors
- LCD display
- traceable calibration certificate with traceability with EN ISO/IEC 17025

Sensor models:

<table>
<thead>
<tr>
<th>MEASURED VALUES</th>
<th>without PoE**</th>
<th>with PoE**</th>
</tr>
</thead>
<tbody>
<tr>
<td>atmospheric pressure</td>
<td>T2514</td>
<td></td>
</tr>
<tr>
<td>relative humidity + temperature</td>
<td>T3510, T3511, T3511P</td>
<td></td>
</tr>
<tr>
<td>relative humidity + temperature + atmospheric pressure</td>
<td>T7510, T7511</td>
<td>T7610, T7611</td>
</tr>
<tr>
<td>temperature</td>
<td>T0510, T4511</td>
<td>T0610, T4611</td>
</tr>
<tr>
<td>CO₂</td>
<td>T5540, T5541</td>
<td></td>
</tr>
<tr>
<td>CO₂+ relative humidity + temperature</td>
<td>T6540</td>
<td></td>
</tr>
</tbody>
</table>

* Please see page 8 - 9 for sensor specification

Common parameters:

- measured values - temperature, relative humidity, CO₂, computed values
- highly accurate and stable sensors
- LCD display
- traceable calibration certificate with traceability with EN ISO/IEC 17025

Sensor models:

<table>
<thead>
<tr>
<th>MEASURED VALUES</th>
<th>without PoE**</th>
<th>with PoE**</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature</td>
<td>PB510</td>
<td></td>
</tr>
<tr>
<td>temperature + relative humidity*</td>
<td>PB511, PB541</td>
<td>PB641, PB611</td>
</tr>
<tr>
<td>temperature + relative humidity* + two - state inputs</td>
<td>PB552</td>
<td>PB652</td>
</tr>
<tr>
<td>0-20mA (4-20 mA)</td>
<td>P2520</td>
<td></td>
</tr>
</tbody>
</table>

* With the attached temperature and humidity probe - type DSRH (max. length 5 metres)

** Please see page 12 - 13 for sensor specification
### Web Sensor t-line without PoE and their specification

<table>
<thead>
<tr>
<th>Measured values</th>
<th>Temperature</th>
<th>Temperature, relative humidity</th>
<th>Temperature, relative humidity, atm. pressure</th>
<th>Atm. pressure</th>
<th>Temperature, relative humidity, CO₂</th>
<th>CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SENSOR MODEL</strong></td>
<td>T4511</td>
<td>T0510</td>
<td>T3510</td>
<td>T3511</td>
<td>T3511P</td>
<td>T7510</td>
</tr>
<tr>
<td>temperature</td>
<td>-200 to +600 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td>accuracy</td>
<td>±0.2 °C without temp. probe</td>
<td>±0.6 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
<td>±0.6 °C</td>
<td>±0.6 °C</td>
</tr>
<tr>
<td>relative humidity **</td>
<td>range</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
</tr>
<tr>
<td>accuracy</td>
<td>-</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
</tr>
<tr>
<td>atm. pressure   **</td>
<td>range</td>
<td>-</td>
<td>600 to 1100 hPa</td>
<td>600 to 1100 hPa</td>
<td>600 to 1100 hPa</td>
<td>-</td>
</tr>
<tr>
<td>accuracy</td>
<td>-</td>
<td>±1.3 hPa</td>
<td>±1.3 hPa</td>
<td>±1.3 hPa</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CO₂ **</td>
<td>range</td>
<td>-</td>
<td>0 to 2000 ppm*</td>
<td>0 to 2000 ppm*</td>
<td>0 to 10000 ppm</td>
<td>0 to 2000 ppm*</td>
</tr>
<tr>
<td>accuracy</td>
<td>-</td>
<td>±50 ppm+2 % of measured value</td>
<td>±50 ppm+2 % of measured value</td>
<td>±110 ppm+5 % of measured value</td>
<td>±50 ppm+2 % of measured value</td>
<td></td>
</tr>
<tr>
<td>computed humidity values</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>recommended calibration interval</td>
<td>two years</td>
<td>two years</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
</tr>
<tr>
<td>protection class of the sensor cover</td>
<td>-</td>
<td>-</td>
<td>IP40</td>
<td>IP40</td>
<td>-</td>
<td>IP 65</td>
</tr>
<tr>
<td>temperature operating range of the case with electronics</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +60 °C</td>
<td>-30 to +60 °C</td>
<td>-30 to +60 °C</td>
</tr>
<tr>
<td>temperature operating range of the measuring element</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-40 to +60 °C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>humidity operating range without condensation</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>5 to 95 % RH</td>
<td>0 to 100 % RH</td>
<td>5 to 95 % RH</td>
</tr>
<tr>
<td>barometric pressure operating range</td>
<td>-</td>
<td>-</td>
<td>2,5 hPa</td>
<td>850 to 1100 hPa</td>
<td>850 to 1100 hPa</td>
<td>850 to 1100 hPa</td>
</tr>
<tr>
<td><strong>custom range 10000 ppm for an extra fee</strong></td>
<td><strong>accuracy of relative humidity in range 5 % to 95 % and of atmospheric pressure at 23 °C</strong></td>
<td><strong>accuracy of CO₂ concentration of measurement at 25 °C and 1013 hPa</strong></td>
<td><strong>5 % to 95 % and of atmospheric pressure at 23 °C</strong></td>
<td><strong>accuracy of CO₂ concentration of measurement at 25 °C and 1013 hPa</strong></td>
<td><strong>5 % to 95 % and of atmospheric pressure at 23 °C</strong></td>
<td><strong>accuracy of CO₂ concentration of measurement at 25 °C and 1013 hPa</strong></td>
</tr>
</tbody>
</table>

### Computed values

| **Specific humidity** | Accuracy: ±2.1 g/kg at ambient temperature T < 35 °C Range: 0 to 500 g/kg |
| **Absolute humidity** | Accuracy: ±3 g/m³ at ambient temperature T < 25 °C Range: 0 to 400 g/m³ |
| **Specific enthalpy** | Accuracy: ± 4 kW/kg at ambient temperature T < 25 °C Range: 0 to 995 kW/kg |

**Dew point temperature**
Accuracy: ±1.5 °C at ambient temperature T<25 °C and relative humidity RH >30 %, for more details see manual
Range: -60 to +80 °C
(-76 to 176 °F)

**Mixing ratio**
Accuracy: ±2.2 g/kg at ambient temperature T < 35 °C
Range: 0 to 995 g/kg

**Specific enthalpy**
Accuracy: ± 4 kW/kg at ambient temperature T < 25 °C
Range: 0 to 995 kW/kg
**Common parameters:**

- The Ethernet RJ45 connector for cable connection. Where power over Ethernet is used, the network infrastructure must be compatible with IEEE 802.3af standard.
- Connector for power adapter with output voltage 4.9 - 6.1 Vdc.
- Case of sensor is made of ABS which is very resistant to mechanical damage.
- Sensor cover with filter from stainless steel mesh. Filtering ability is 0.025mm.
- Mounting holes for mounting the unit on the wall.
- Display for current measured values.
- RTD Pt1000 temperature sensor together with state-of-the-art capacitive polymer sensor.
- Measured values: Temperature, relative humidity, atmospheric pressure, computed values.
- Power over Ethernet (PoE) according to IEEE 802.3af.
- Measured values are traceable with EN ISO/IEC 17025 calibration certificate.

### Measured values

<table>
<thead>
<tr>
<th>SENSOR MODEL</th>
<th>T4611</th>
<th>T6610</th>
<th>T3610</th>
<th>T3611</th>
<th>T7610</th>
<th>T7611</th>
<th>T7613D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>range</td>
<td>-200 to +600 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-30 to +105 °C</td>
<td>-20 to +60 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.2 °C without temperature probe</td>
<td>±0.6 °C</td>
<td>±0.6 °C</td>
<td>±0.4 °C</td>
<td>±0.6 °C</td>
<td>±0.4 °C</td>
<td>±0.6 °C</td>
</tr>
<tr>
<td>Relative humidity*</td>
<td>range</td>
<td>-</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
</tr>
<tr>
<td>Accuracy</td>
<td>-</td>
<td>±2.5 %RH</td>
<td>±2.5 %RH</td>
<td>±2.5 %RH</td>
<td>±2.5 %RH</td>
<td>±2.5 %RH</td>
<td>±2.5 %RH</td>
</tr>
<tr>
<td>Atm. pressure range</td>
<td>±8.1 ± 1.3 kPa</td>
<td>±8.1 ± 1.3 kPa</td>
<td>±8.1 ± 1.3 kPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Computer humidity values</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Power over Ethernet (PoE) according to IEEE 802.3af</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Recommended calibration interval</td>
<td>two years</td>
<td>two years</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
</tr>
<tr>
<td>Protection class of the case with electronics</td>
<td>IP30</td>
<td>IP30</td>
<td>IP30</td>
<td>IP30</td>
<td>IP30</td>
<td>IP30</td>
<td></td>
</tr>
<tr>
<td>Protection class of the sensor cover</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Temperature operating range of the case with electronics</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
<td>-20 to +60 °C</td>
</tr>
<tr>
<td>Temperature operating range of the measuring element</td>
<td>-</td>
<td>-</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-20 to +60 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td>Humidity operating range without condensation</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
</tr>
</tbody>
</table>

* Accuracy of relative humidity in range 5 % to 95 % and of atmospheric pressure at 23 °C

**Computation values:**

- Specific humidity: Accuracy ±2.1 g/kg at ambient temperature T < 35 °C. Range: 0 to 550 g/kg.
- Dew point temperature: Accuracy ±1.5 °C at ambient temperature T ≤ 25 °C and relative humidity RH > 90 %. For more details see manual. Range: -60 to +80 °C (-76 to 176 °F).
- Absolute humidity: Accuracy ±3.2 g/m³ at ambient temperature T < 25 °C. For more details see manual. Range: 0 to 400 g/m³.
- Mixing ratio: Accuracy ±3.2 g/kg at ambient temperature T < 35 °C. Range: 0 to 995 g/kg.
- Specific enthalpy: Accuracy ±4 kJ/kg at ambient temperature T < 25 °C. Range: 0 to 995 kJ/kg.
## Web Sensor p-line and their specification

### Measured values

<table>
<thead>
<tr>
<th>SENSOR MODEL</th>
<th>Temperature</th>
<th>Temperature, relative humidity</th>
<th>Current - mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>P8510/ P8610</td>
<td>PB511/ PB611</td>
<td>PB541/ PB641</td>
<td>PB552/ PB652</td>
</tr>
<tr>
<td>temperature</td>
<td>range</td>
<td>according to the used probe*</td>
<td>according to the used probe*</td>
</tr>
<tr>
<td>accuracy</td>
<td>±0.5 °C (&lt; -10 °C)</td>
<td>according to the used probe*</td>
<td>according to the used probe*</td>
</tr>
</tbody>
</table>

| relative humidity | range | according to the used probe*  | according to the used probe*  | according to the used probe*  | - |
| accuracy         | -     | according to the used probe*  | according to the used probe*  | according to the used probe*  | - |

- two - state input, no galvanic isolation: -
- current measuring range: -
- accuracy of current measurement: ±0.1 % FS from (0 °C do +50 °C)
- resolution: 1mA
- input impedance: 20Ω
- supply voltage: 9-30 V / 4,9 - 6,1V
- power over Ethernet (PoE): according to IEEE 802.3af
- recommended calibration interval: two years
- protection class of the case with electronics: IP30
- temperature operating range of the case with electronics: -30 to +80 °C / -20 to +60 °C
- humidity operating range without condensation: 0 do 100 % RV
- signal input: 0 - 20 mA
- signal output: 0 - 20 mA
- power supply: 9-30 V / 4,9 - 6,1V

### Temperature external probes

<table>
<thead>
<tr>
<th>SENSOR MODEL</th>
<th>DSTD9/C</th>
<th>DSTD40/C</th>
<th>DSTR167/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature</td>
<td>range</td>
<td>accuracy</td>
<td>range</td>
</tr>
<tr>
<td>-50 to +100 °C</td>
<td>±0.5 °C from (0 °C do +50 °C)</td>
<td>±0.5 °C from (-10 °C do +80 °C)</td>
<td></td>
</tr>
<tr>
<td>-30 to +80 °C</td>
<td>±0.2 °C otherwise</td>
<td>±0.2 °C otherwise</td>
<td></td>
</tr>
<tr>
<td>-30 to +80 °C</td>
<td>±0.2 °C otherwise</td>
<td>±0.2 °C otherwise</td>
<td></td>
</tr>
</tbody>
</table>

- recommended calibration interval: two years
- IP class of case with electronics: IP67
- humidity operating range without condensation: 0 to 100 % RH
- sensor dimensions (diameter x length): 5.7 x 40 mm

The maximum sum of the lengths of all probes is 40m.

### Temperature, humidity external probes

<table>
<thead>
<tr>
<th>SENSOR MODEL</th>
<th>DSRH</th>
<th>DSRH/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature</td>
<td>range</td>
<td>accuracy</td>
</tr>
<tr>
<td>0 to +50 °C</td>
<td>±2 °C</td>
<td></td>
</tr>
<tr>
<td>±0.5 °C</td>
<td>±0.5 °C from (0 °C do +50 °C)</td>
<td></td>
</tr>
<tr>
<td>±0.5 °C</td>
<td>±0.5 °C from (-10 °C do +80 °C)</td>
<td></td>
</tr>
</tbody>
</table>

- humidity operating range without condensation: 0 to 100 % RH
- sensor dimensions (diameter x length): 18 x 88 mm

P2520 two channel current loop converter is designed to connect sensors with output 4-20mA / 0-20 mA into Ethernet network. The current signal can be recalculated to physical values measured by the connected sensors. Sensors can be powered directly from the P2520 converter.

- Measured values can be read by means of Ethernet connection.
- The instrument may also send a warning message if the measured value exceeds adjusted limit.
- The device setup can be made by the www interface.
Programmable regulators with Ethernet connection are designed to measure temperature and relative humidity of air, to measure concentration of CO₂ in the air, to signal alarms and control external devices. Regulators can be used in a chemically non-aggressive environment. Measured values are according to device type. Devices with relative humidity measurement can show one of computed values: dew point temperature, absolute humidity, specific humidity, mixing ratio and specific enthalpy. Temperature units are °C or °F. The CO₂ concentration is measured using the maintenance free sensor. The unique patented auto-calibration procedure compensates ageing of the measuring element and guarantees outstanding high reliability and long-term stability.

The sensors are equipped with two relay outputs for alarm indication or control of external devices. Each relay can be assigned to any input value, set up the comparing limit, delay, hysteresis and audible alarm. As an option you can remotely change its status via Modbus communication protocol. Sensors are also equipped with three two-state inputs for detection of two-state signals, e.g. flood detection, smoke detection, door contacts and so on.

The device can be used to check measured values. In case of going over the limits set up by the user it can send a warning message to the user’s chosen destination.

The device is internally divided into two blocks, the first one takes care of measuring and output relays. It is possible to set up these parameters directly from the keyboard or from the free to download program TSensor. This software can be downloaded from www.cometsystem.cz The second block will ensure all Ethernet services. Its configuration can be done by the help of TELNET software or from the free to download program TSensor. Warning, this setup cannot be changed by the device’s own keyboard.

Relay outputs
Two relay output for alarming or external device control. It is possible to assign any input value to each relay. Relay can be remotely controlled using ModbusTCP communication protocol.

Two-state inputs
It is possible to read three two-state inputs statuses for detection of two-state events - e.g. smoke, water leak detectors, door contact. Supported two-state inputs: dry contact, open collector or two-state voltage signal.

Acoustic alarms
Acoustic signalisation can be activated after exceeding set limits. Alarm can be confirmed (deactivated) from the device keyboard.

WWW server
Current values are available via embedded web server. Design of the web pages can be changed according to user requirements.

Email
Warning emails are sent when measured value exceed selected limits. SMTP authentication is supported, but SSL not.

History export to CSV
History values can be exported for next processing by the CSV file. CSV file can be processed inside spreadsheet application like Microsoft Excel or OpenOffice Calc.

ModbusTCP protocol
Modbus protocol for communication with SCADA systems or third party software. Device use version of Modbus TCP protocol.

SNMP protocol
SNMP version 1 protocol for IT infrastructure. Using SNMP protocol you can read actual measured values, alarm statuses and alarm parameters. MIB tables with OID description are available.

SNMP Trap
SNMP Trap for IT infrastructure. The device allows sending Traps to selected Trap receiver server. Traps are sent in case of alarm on channel or at error states.

SOAP protocol
The device allows to send currently measured values via SOAP v1.1 protocol. The device sends values in XML format to the web server. The advantage of this protocol is that communication is initialized by the device side. Therefore it is not necessary to use port forwarding.

Syslog protocol
Syslog protocol for IT infrastructure monitoring systems. The device allows sending text messages to selected Syslog server. Messages are sent in case of alarm on channel or at error states.

SNTP protocol - time synchronization
Time synchronisation with SNTP server. Actual time is shown at web pages and is necessary for timestamps inside CSV files.
Sensors of temperature, relative humidity, atm. pressure, CO₂ with Ethernet and relay outputs

**Common parameters:**

- Glands for the cable to the output relay
- Glands for cables
- Mounting holes for mounting the unit on the wall
- 0 to 1000 ppm
- 1000 to 1200 ppm
- 1200 to 2000/10 000 ppm
- Limits of LED indication may be changed by user
- Air intakes for CO₂ measurement
- Sensors of temperature, relative humidity, atmospheric pressure, CO₂, computed values
- traceable calibration certificate with traceability with EN ISO/IEC 17025
- Common parameters: Common parameters:

**Sensor models:**

<table>
<thead>
<tr>
<th>MEASURED VALUES</th>
<th>unit designation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature + 3 two - state inputs</td>
<td>H0530, H4531</td>
</tr>
<tr>
<td>temperature + relative humidity + 3 two - state inputs</td>
<td>H3530, H3531, H3531P</td>
</tr>
<tr>
<td>temperature + relative humidity + atm. pressure + 3 two - state inputs</td>
<td>H7530, H7531</td>
</tr>
<tr>
<td>CO₂</td>
<td>H5521, H5524</td>
</tr>
<tr>
<td>CO₂ + relative humidity + temperature</td>
<td>H6520</td>
</tr>
</tbody>
</table>

* Please see page 18 - 19 for sensor specification

**Common parameters:**

- Visualization of two - state inputs is done by three LED diodes. Each relay status is indicated with other two LED diodes described as ALARM1 and ALARM2 shown also on LCD.
- Mounting brackets to rack 19"
- Display with keypad for setting
- RTD Pt1000 temperature sensor together with state-of-the-art capacitive polymer sensor
- Glands for cables
- Ethernet RJ45 connector for cable connection
- Connector for power adapter with output voltage 9-30 Vdc

**Sensor models:**

<table>
<thead>
<tr>
<th>MEASURED VALUES</th>
<th>unit designation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature + 3 two - state inputs</td>
<td>H4531R</td>
</tr>
<tr>
<td>temperature + relative humidity + 3 two - state inputs</td>
<td>H3531R</td>
</tr>
</tbody>
</table>

* Please see page 19 for sensor specification
### Sensors with Ethernet and relay outputs and their specification

<table>
<thead>
<tr>
<th>Measured values</th>
<th>Temperature</th>
<th>Temperature, relative humidity</th>
<th>Temperature, relative humidity, atm. pressure</th>
<th>Temperature, relative humidity, CO₂</th>
<th>CO₂</th>
<th>Temperature</th>
<th>Temperature, relative humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SENSOR MODEL</strong></td>
<td><strong>H4531</strong></td>
<td><strong>H0530</strong></td>
<td><strong>H3530</strong></td>
<td><strong>H3531</strong></td>
<td><strong>H3531P</strong></td>
<td><strong>H7530</strong></td>
<td><strong>H7531</strong></td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>-200 to +600 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td><strong>accuracy</strong></td>
<td>±0.2 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
<td>±0.4 °C</td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>-200 to +600 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td><strong>relative humidity</strong></td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
</tr>
<tr>
<td><strong>atmospheric pressure</strong></td>
<td>600 to 1100 hPa</td>
<td>600 to 1100 hPa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>-</td>
<td>-</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
<td>±2.5 % RH</td>
</tr>
<tr>
<td><strong>accuracy</strong></td>
<td>±1.3 hPa</td>
<td>±1.3 hPa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>accuracy</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>range</strong></td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
<td>50 V, 2 A, 60 VA</td>
</tr>
<tr>
<td><strong>accuracy</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>computed humidity values</strong></td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>recommended calibration interval</strong></td>
<td>two years</td>
<td>two years</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
<td>one year</td>
</tr>
<tr>
<td><strong>protection class of the case with electronics</strong></td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
<td>IP40</td>
</tr>
<tr>
<td><strong>protection class of the sensor cover</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>temperature operating range of the case with electronics</strong></td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
<td>-30 to +80 °C</td>
</tr>
<tr>
<td><strong>temperature operating range of the measuring element</strong></td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
<td>-30 to +105 °C</td>
</tr>
<tr>
<td><strong>humidity operating range without condensation</strong></td>
<td>0 to 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 až 100 % RH</td>
<td>0 až 100 % RH</td>
<td>0 to 100 % RH</td>
<td>0 to 95 % RH</td>
<td>5 to 95 % RH</td>
</tr>
<tr>
<td><strong>barometric pressure operating range</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>up to 2.5 MPa</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Custom range 10000 ppm for an extra fee  
** accuracy of relative humidity in range 5 % to 95 % and of atmospheric pressure at 23 °C  
*** accuracy of CO₂ concentration of measurement at 25 °C and 1013 hPa  

**Electrical wiring**  
**Connection via PoE adapter**  
**Specific humidity**  
**Dew point temperature**  
**Absolute humidity**  
**Mixing ratio**  
**Specific enthalpy**
### Optional accessories

**Detectors**

- **PP90** - Right-angled stainless steel flange.
- **PP4** - Plastic flat circular flange.
- **SP004** - Plastic gland for direct mounting of the humidity probe to a 29 mm diameter hole.


The probe for measuring the moisture of compressed air should be placed directly on the pressure pipelines to achieve higher measurement accuracy and faster response times. But there are cases where such placement is not possible. The reason is the high air speed, high temperature, high pollution, small diameter pipes, etc. Such situation can be solved by placing the probe into the flow measuring chamber.

**MP047** Universal holder for probes for easy mounting to rack 19".

**MP046** Universal holder for P8xxx and Tx5xx Web Sensors for easy mounting to rack 19".

**Protection of sensors**

- **FS100** - Solar radiation shield for transmitters with T+RH probe on a cable.
- **FS200** - Grey sensor cover with filter from stainless steel mesh, filtering ability 0.025mm.
- **FS200B** - Black sensor cover with filter from stainless steel mesh, filtering ability 0.025mm.
- **F0009** - Sintered bronze sensor cover. Filtering ability 0.025mm.

**Power supplies**

- **PoE switch**
  - IEEE 802.3af compatible
- **Power Cable**
  - (+12 V)
- **CAT5 UTP cable**
  - (Power & Data)
- **PoE splitter**
  - TL-POE10R

**TL-POE** - Power over Ethernet (PoE) splitter for connection of sensors and Web Sensors which do not support PoE.

**A1515** Switching power supply unit for Ethernet transmitters Tx5xx, Hx5xx.

**A1825** Switching power supply unit for Web Sensors P8xxx and Tx6xx.

**F8100** - Solar radiation shield for transmitters with T+RH probe on a cable.

**F5300** - Teflon (PTFE) sensor cover (white colour), with increased resistance against splashing water, non-ab sorbing surface, does not rust. Porous size 25μm. Temperature range -40°C to +125°C.

**F5200** - Grey sensor cover with filter from stainless steel mesh, filtering ability 0.025mm.

**F5200B** - Black sensor cover with filter from stainless steel mesh, filtering ability 0.025mm.

**F0000** - Sintered bronze sensor cover. Filtering ability 0.025mm.

**Mounting accessories**

**HM024** - Set of humidity standards 80% RH with 5 application pads.

**HM023** - Set of humidity standards 10% RH with 5 application pads.

**MD046** - Vessel for adjustment and calibration of humidity.

**Communication**

**TP-LINK-TL**

Wi-Fi adapter for wireless connection of transmitter or data logger to Ethernet network. Including replaceable antenna and power adapter. Long term proved operation.

**KIT-GSM-W** - If GSM modem is connected to your computer or server where Comet database is installed then you get the 24-hour surveillance of critical events. This inexpensive service can prevent costly damage to health, goods and property.
For users of Web Sensors a solution for data collection to one central database is available. It is based on MS SQL or MySQL. Software system is suitable for users who want to analyze data from multiple loggers MS or other products of Comet System.

Comet Database offers:

- data stored in one place and accessible with Comet Database Viewer
- to provide data in table and graph
- to print and export data
- alarms via SMS texts and emails
- acoustic and visual signalization of alarms
- compatibility with all Comet System devices and 3rd party devices
- displaying of online values

If you already have Comet database there is no need to purchase any additional software for running your Web Sensors with Comet Database. Comet Database also exists in 30 days trial version. So you can test it without any worries.

Comet Database Viewer
Each purchased Comet Database already contains one licence of Database Viewer. This low cost browser enables several clients to view database from different places on internal network or internet. Other viewer licences can be purchased separately for other users of Comet Database.
Cometeo radiation shield is designed for no chemically aggressive environments. The meteo shield protects the measuring sensor and equipment that is hidden under the roof. Compact size, light weight and resistant plastic material make this shield useful for many applications. A variety of temperature and humidity probes are available.

Can be used together with temperature and humidity sensors with cable gland and LCD display positioned perpendicular to stem such types T7613D.

Can be used together with temperature and humidity dataloggers, sensors or regulators with external probe on the cable such T3511, T7511, T3611, H3531, H7531.