



Dew point set DS 400

for stationary dew point monitoring of refrigeration or desiccant driers. The touch screen graphic display enables an intuitive operation and shows the progress of the measured values. 2 alarm relays are available for monitoring of threshold values. Available either with a classic analogue output 4...20 mA or optionally with digital interfaces like Ethernet and RS 485 (Modbus protocol). As a stand-alone solution the measured data stored in the optional data logger can be read-out via USB stick and evaluated by means of the software CS Soft Basic.

Dew point set DS 400

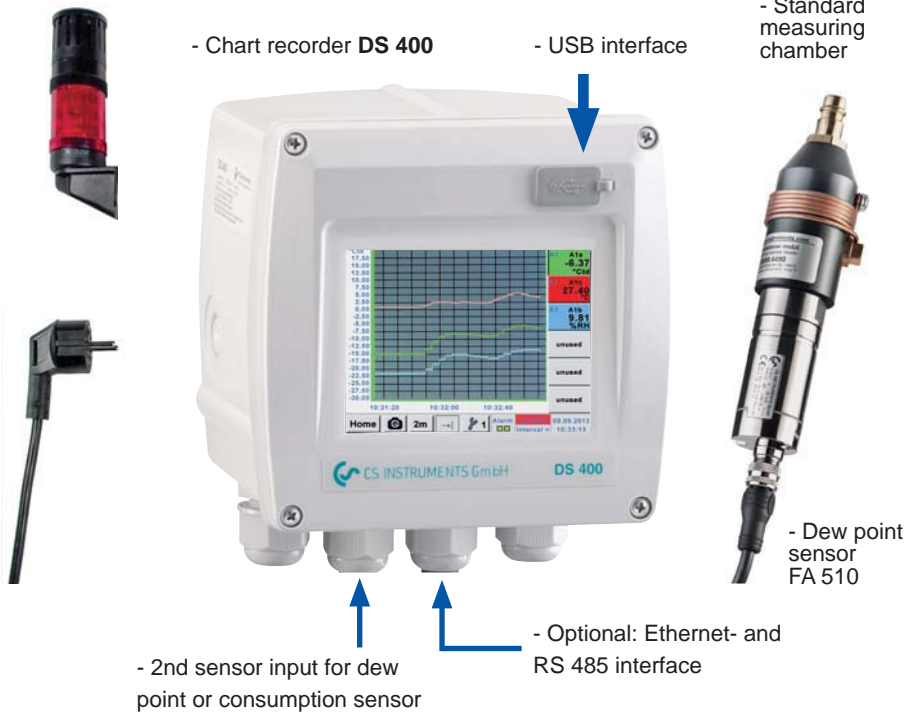
consisting of:

- Option alarm unit (buzzer and continuous red light)

- Chart recorder DS 400

- USB interface

- Standard measuring chamber



- 2nd sensor input for dew point or consumption sensor

- Optional: Ethernet- and RS 485 interface

- Dew point sensor FA 510

Special features:

- 3.5" graphic display - easy operation with touch screen
- System ready for plug-in: Everything completely wired
- 2 alarm contacts (230 VAC, 3 A) pre- and main alarm freely adjustable
- **NEW:** An alarm delay can be set for each alarm relay
- 4...20 mA analogue output
- Option: Ethernet and RS 485 interface (Modbus protocol)
- Option: Webserver



Option: Integrated data logger

- Recording of the dew point progression of up to 100 million measuring values
- CS Soft Basic for evaluation in graphic and table form. Read-out of the data either via USB stick or via Ethernet

Technical data DS 400

| | |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions: | 118 x 115 x 98 mm IP 54 (wall housing) 92 x 92 x 75 mm (panel mounting) |
| Inputs: | 2 digital inputs for FA sensors |
| Interface: | USB |
| Power supply: | 100...240 VAC, 50-60 Hz |
| Accuracy: | please see FA 510 |
| Alarm outputs: | 2 relays, (pot.-free) |
| Options: | |
| Data logger: | 100 million measuring values start/stop time, measuring rate freely adjustable |
| 2 additional sensor inputs: | for connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4...20 mA 0 to 10 V, Pt 100, Pt 1000 |

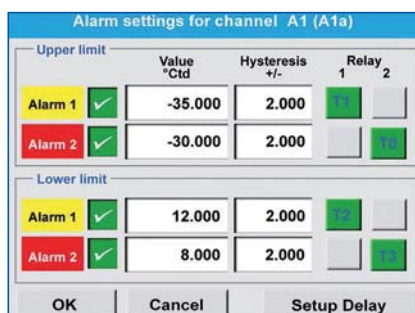
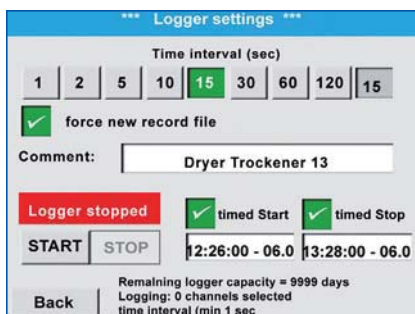
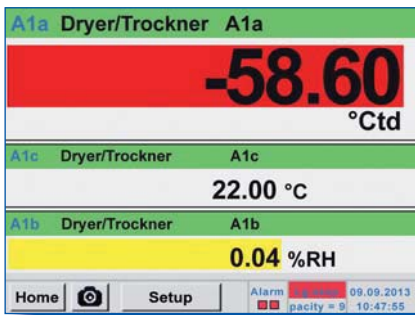
Technical data FA 510

| | |
|-------------------------|---------------------------------------------------------------------------------|
| Measuring range: | -80...20 °Ctd resp. -20...50 °Ctd |
| Accuracy: | ± 1 °C at 20...-20 °Ctd ± 2 °C at -20...-50 °Ctd ± 3 °C at -50...-80 °Ctd |
| Pressure range: | -1...50 bar, special version up to 350 bar |

| Description | Order No. |
|------------------------------------------------------------------------------------------------------------------|-----------|
| Dew point set DS400 for desiccant driers (-80...20° Ctd.) | 0601 0510 |
| Dew point set DS400 for refrigeration driers (-20...+50°Ctd) | 0601 0512 |
| Options | |
| Option: Integrated data logger for 100 million measured values | Z500 4002 |
| Option: Integrated Ethernet and RS 485 interface | Z500 4004 |
| Option: Integrated webserver | Z500 4005 |
| Option: 2 additional sensor inputs for analogue sensors (pressure sensor, temperature sensor and so on) | Z500 4001 |
| Further accessories | |
| CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet | 0554 7040 |
| Alarm unit mounted at wall housing | Z500 0003 |
| Alarm unit for external mounting with 5 m cable | Z500 0004 |
| Calibration | |
| Precision calibration at -40 °Ctd or +3 °Ctd including ISO certificate | 0699 3396 |



Easy operation via touch screen



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Actual measured values

All measured values can be seen at a glance. Threshold exceedings are indicated in red colour. A „measuring site name“ can be allocated to each sensor.

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Graphic view

In the graphic view all measured values are indicated as curves. It is possible to brows back on the time axis by a slide of the finger (without data logger maximum 24 h, with data logger back to the start of the measurement).

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Data logger

Measured values are stored in DS 400 by means of the option „integrated data logger“. The time interval can be freely set. Furthermore there is the possibility to fix the starting time and the end time of the data recording. Read-out of the measured data via USB interface or via the optional Ethernet interface.

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Selection of the language

DS 400 „speaks“ several languages. The required language can be selected by means of the select button.

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Adjustment of the alarm relays

Each one of the 2 alarm relays can be allocated individually to a connected sensor. The alarm thresholds and the hysteresis can be freely adjusted. NEW: It is possible to set an alarm delay for each alarm relay so that the relay is just triggered after that period of time.



DS 400 - Chart recorder

for all relevant parameters of compressed air

Software options:

- Integrated webserver
- Mathematics calculation function
- Totalizer function

Hardware options:

- Integrated data logger
- Ethernet / RS 485 interface
- additional sensor inputs (digital or analogue) selectable



Standard equipment:

- USB interface
- 3.5" graphic display with touch screen
- Integrated mains unit for supply of the sensors
- 4...20 mA output of all connected active sensors
- Pulse output (for total consumption) in case of flow sensors
- 2 alarm relays (pot.-free switch-over contacts, max. 230 V, 3 A)

The 2 sensor inputs board 1 and 2 can be selected according to the required sensors:

| Digital | Digital | Digital | Digital | Analogue | Analogue | Analogue | Analogue |
|-----------------------------------|---------|---------|----------|----------|----------|----------|----------|
| m ³ /h, m ³ | °Ctd | A, kW/h | optional | bar | A | °C | °C |



4...20 mA
0...20 mA
0...10 V
Pulse
Pt 100
Pt 1000

| Flow sensor | Dew point sensor | Current meters | Third-party sensors with RS 485 | Pressure sensor | Clamp-on ammeter | Temperature sensor | Third-party sensors analogue output |
|-------------|------------------|----------------|---------------------------------|-----------------|------------------|--------------------|-------------------------------------|
| | | | | | | | |

| Description | Order No. | | |
|----------------------------------------------------------------------|-------------------------|-------------------------|--------------|
| DS 400 - Mobile chart recorder with graphic display and touch screen | 2 sensor inputs board 1 | 2 sensor inputs board 2 | |
| | Digital (Z500 4003) | ----- | 0500 4000 D |
| | Digital (Z500 4003) | Digital (Z500 4003) | 0500 4000 DD |
| | Digital (Z500 4003) | Analogue (Z500 4001) | 0500 4000 DA |
| | Analogue (Z500 4001) | ----- | 0500 4000 A |
| Analogue (Z500 4001) | Analogue (Z500 4001) | 0500 4000 AA | |

| Options | Order No. |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Option: Integrated data logger for 100 million measured values | Z500 4002 |
| Option: Integrated Ethernet and RS 485 interface | Z500 4004 |
| Option: Integrated webserver | Z500 4005 |
| Option: „Mathematics calculation function“ for 4 freely selectable channels, (virtual channels): addition, subtraction, division, multiplication | Z500 4007 |
| Option: „Totalizer function for analogue signals“ | Z500 4006 |
| External Gateway Profibus | Z500 3008 |

| Further accessories | Order No. |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------|
| CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet | 0554 7040 |
| CS Soft Network - Database Client/Server Solution (up to 5 DS 400) - database (MySQL) to Server - data evaluation via Client-Software | 0554 7041 |
| CS Soft Network - Database Client/Server Solution (up to 10 DS 400) - database (MySQL) to Server - data evaluation via Client-Software | 0554 7042 |
| CS Soft Network - Database Client/Server Solution (up to 20 DS 400) - database (MySQL) to Server - data evaluation via Client-Software | 0554 7043 |
| CS Soft Network - Database Client/Server Solution (>20 DS 400) - database (MySQL) to Server - data evaluation via Client-Software | 0554 7044 |

Technical data DS 400

Dimensions: 118 x 115 x 98 mm
IP 54 (wall housing)
92 x 92 x 75 mm (panel mounting)

Inputs: 2 digital inputs for FA 510 resp. VA 500/520

Interface: USB

Power supply: 100...240 VAC, 50-60 Hz

Accuracy: please see FA 510

Alarm outputs: 2 relays, (pot.-free)

Options:

Data logger: 100 million measuring values start/stop time, measuring rate freely adjustable

2 additional sensor inputs: for connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4...20 mA 0 to 10 V, Pt 100, Pt 1000

Input signals

Current signal (0...20mA/4...20mA)
internal or external power supply
Measuring range 0...20 mA
Resolution 0.0001 mA
Accuracy ± 0.003 mA ± 0.05 %
Input resistance 50 Ω

Voltage signal (0...1 V)
Measuring range 0...1 V
Resolution 0.05 mV
Accuracy ± 0.2 mV ± 0.05 %
Input resistance 1 MΩ

Voltage signal (0...10 V / 30 V)
Measuring range 0...10 V
Resolution 0.5 mV
Accuracy ± 2 mV ± 0.05 %
Input resistance 1 MΩ








RTD Pt 100
Measuring range -200...850°C
Resolution 0.1°C
Accuracy ± 0.2°C (-100...400°C)
± 0.3°C (further range)

RTD Pt 1000
Measuring range -200...850°C
Resolution 0.1°C
Accuracy ± 0.2° (-100...400°C)

Pulse
Measuring range min pulse length 500 µs frequency 0...1 kHz max. 30 VDC

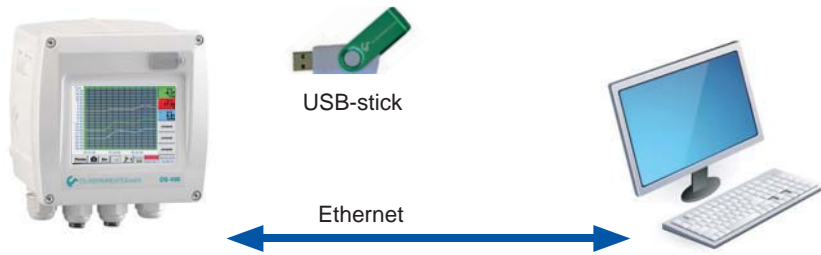


Suitable probes from the CS Instruments product range

| Flow sensors VA 500: | Order No. | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------|
| VA 500 flow sensor in basic version: Standard (92.7 m/s), sensor length 220 mm, without display | 0695 5001 |  |
| Option for VA 500: | | |
| Max. version (185 m/s) | Z695 4003 | |
| High Speed version (224 m/s) | Z695 4002 | |
| Sensor length 120 mm | ZSL 0120 | |
| Sensor length 160 mm | ZSL 0160 | |
| Sensor length 300 mm | ZSL 0300 | |
| Sensor length 400 mm | ZSL 0400 | |
| Flow meters VA 520: | | |
| Flow meter VA 520 with integrated measuring section, (R 1/4" DN 8) | 0695 0520 |  |
| Flow meter VA 520 with integrated measuring section, (R 1/2" DN 15) | 0695 0521 | |
| Flow meter VA 520 with integrated measuring section, (R 3/4" DN 20) | 0695 0522 | |
| Flow meter VA 520 with integrated measuring section, (R 1" DN 25) | 0695 0523 | |
| Flow meter VA 520 with integrated measuring section, (R 1 1/4" DN 32) | 0695 0526 | |
| Flow meter VA 520 with integrated measuring section, (R 1 1/2" DN 40) | 0695 0524 | |
| Flow meter VA 520 with integrated measuring section, (R 2" DN 50) | 0695 0525 | |
| | | |
| Dew point sensors: | | |
| FA 510 dew point sensor, -80...+20 °Ctd incl.inspection certificate | 0699 0510 |  |
| FA 510 dew point sensor, -20...+50°Ctd, incl.inspection certificate | 0699 0512 | |
| Standard measuring chamber for compressed air up to 16 bar | 0699 3390 | |
| Connection cables for flow sensors / dew point sensors: | | |
| Connection cable 5 m | 0553 0104 | |
| Connection cable 10 m | 0553 0105 | |
| Pressure sensors: (further pressure sensors on page 9) | | |
| Standard pressure sensor CS 16 from 0...16 bar, ± 1 % accuracy of full scale | 0694 1886 |  |
| Standard pressure sensor CS 40 from 0...40 bar, ± 1 % accuracy of full scale | 0694 0356 | |
| Temperature sensors: | | |
| Bendable temperature probe, Pt100 Class B, length 300 mm, 2 m probe connection cable glass fibre/stainless steel open end wires | 0604 0107 |  |
| Screw-in temperature probe Pt 100 Class A, length: 300 mm with measuring transducer 4 to 20 mA = -50 to +500 °C (2-wire technology) | 0693 0002 | |
| Indoor/outdoor temperature probe -50...+100°C | 0604 0101 | |
| Temperature probe cable Pt 100, Class A, length: 300 mm, Ø 6 mm, -50...+180°C, with 5 m connection cable with open ends | 0604 0102 | |
| Temperature probe cable Pt 100, Class A, length: 150 mm, Ø 6 mm, +50...+180°C with 5 m connection cable with open ends | 0604 0100 | |
| Clamp screwing 6 mm, G 1/2", PTFE clamping, pressure-tight up to 6 bar | 0554 6003 | |
| Clamp screwing 6 mm, G 1/2", VA clamping, pressure-tight up to 10 bar | 0554 6004 | |
| | | |
| Connection cables for pressure sensors / temperature sensors: | | |
| Connection cable 5 m | 0553 0108 | |
| Connection cable 10 m | 0553 0109 | |
| Clamp-on ammeters: | | |
| Clamp-on ammeter 0...1000 A TRMS incl. 5 m connection cable with open ends | 0554 0518 |  |
| Clamp-on ammeter 0...400 A TRMS incl. 3 m connection cable with open ends | 0554 0510 | |
| Optional third-party sensors 0/4...20 mA, 0...1/10/30 V, Pt 100 / Pt 1000, KTY, pulse, RS 485 Modbus connectable. | | |
| Current / effective power meter (further current transformer please see on page 10) | | |
| CS PM 210 current/effective power meter for panel mounting, current transformer from 100 A to 2000 A connectible | 0554 5353 |  |
| Current transformer 100/5 A connectible to current/effective power meter for panel mounting (for cables up to Ø 21 mm) | 0554 5344 | |
| Current transformer 500/5 A connectible to current/effective power meter for panel mounting (for cables up to Ø 21 mm) | 0554 5347 | |
| Connection cable to DS 400, 5 m, with open ends | 0553 0108 | |
| Connection cable to DS 400, 10 m, with open ends | 0553 0109 | |
| | | |

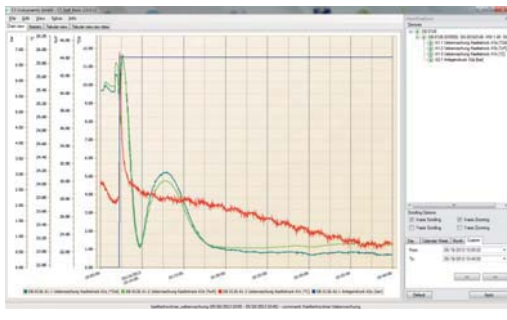


CS Soft Basic - evaluation of measured data for single computers



The measured data stored in the data logger integrated in DS 400 can be read-out via USB stick.

If DS 400 has the optional Ethernet interface the measured data can also be read-out over big distances via the computer network



- • • **Graphic evaluation**

All measurement curves are indicated in different colours. All necessary functions like free zoom, selection/deselection of single measured curves, free selection of time periods, scaling of the axis, selection of colours and so on are integrated:

This view can be stored as a pdf file and sent by e-mail. Different data can be merged in one million file.

This screenshot displays the 'Table view' of the software. It shows a large table with multiple columns, including time, channel name, and measured values. The table is organized into sections, and a diagram explorer on the right allows for selecting specific measuring channels and sites.

- • • **Table view**

All measured points are listed with the exact time interval. The desired measuring channels with the measuring site name can be selected via the diagram explorer.

This screenshot shows a 'Statistic Report' for the period 05/14/2013 10:09 - 05/16/2013 10:00. It includes a table with columns for channel name, min, max, average, and other statistical data. The report provides a quick overview of the data's range and central tendencies.

- • • **Statistics**

All necessary statistics data are apparent at a glance. So the user can quickly see which minimum or maximum measured values occurred at which time and for how long.

This screenshot displays the 'Energy and flow evaluation' view. It features a table with columns for channel name, description, and various energy and flow metrics. The table is organized into sections, and a diagram explorer on the right allows for selecting specific measuring channels and sites.

- • • **Energy and flow evaluation**

The software carries out on energy and flow analysis for all connected flow sensors optionally as daily, weekly or monthly report.

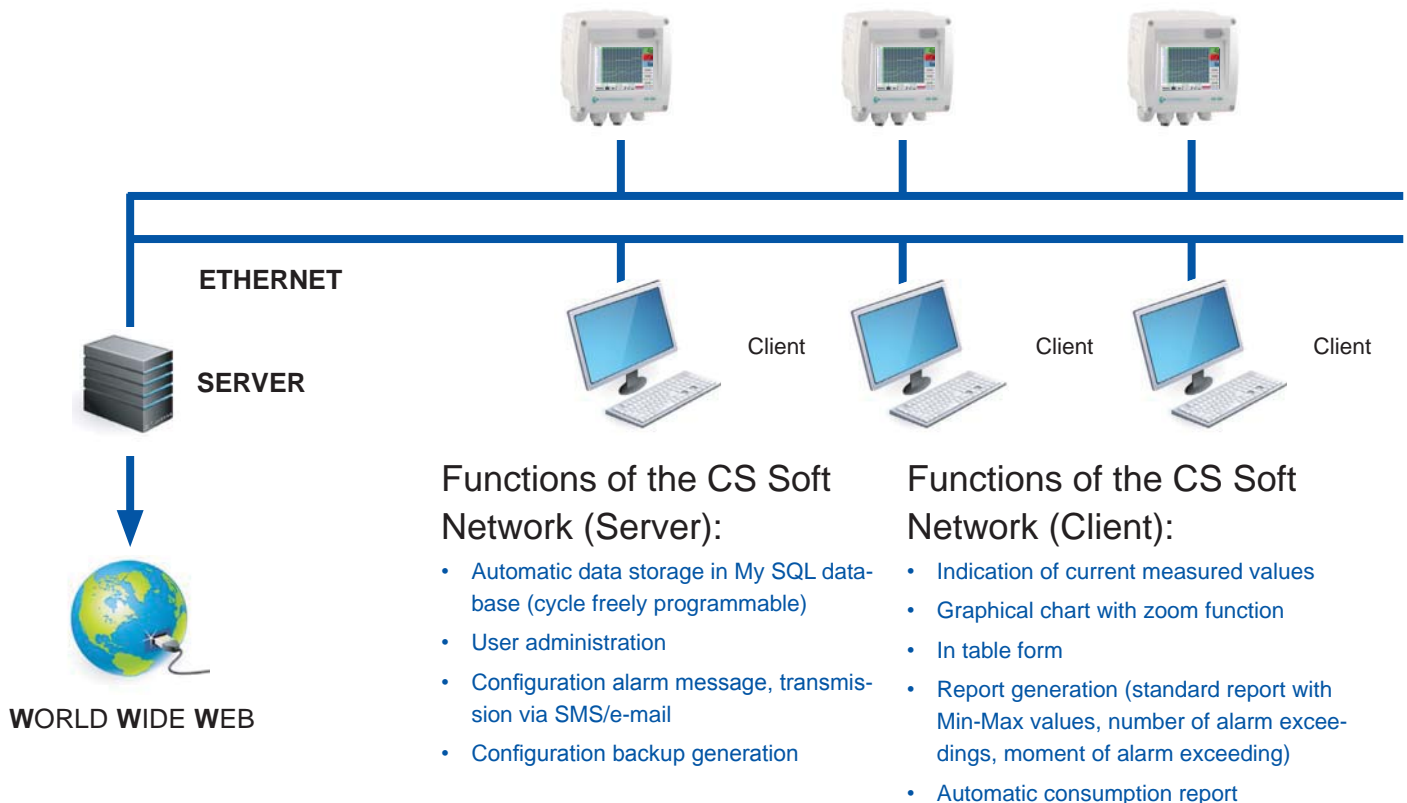


CS Soft Network - evaluation of the measured data for several computers in the network

By means of the CS Soft Network an optional number of DS 500/ DS 400 instruments can be evaluated via Ethernet. The software stores the measured data of all DS 500 / DS 400 cyclically (cycle freely selectable) in a SQL database on the server. In case

of an exceeding of the stored alarm values the software automatically sends an SMS or an e-mail. Furthermore, different user levels can be defined in the server software so that single staff members only can access the measured data of certain DS 500 / DS 400.

The evaluation of the measured data can be carried out by means of the client software from each PC within the company.



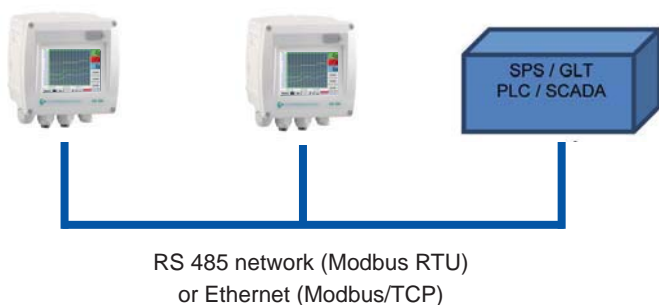
Access to the measured values via the webservice



With the option „Webservice“ (order no. Z500 4005) DS 400 can be contacted without any special software from each web browser (e.g. Mozilla Firefox®, Microsoft Internet Explorer®).

The access can also be done via the World Wide Web. The web-server indicates the actual measured values of all sensors as well as the status of the alarm relays and the logger status in the web browser.

Connection to Bus system



With the option „Ethernet / RS 485 - interface“ (order no. Z500 4004) DS 400 can be connected to customer-owned Bus system (e.g. PLC, building management system BMS, central control system, SCADA,...).

The measured values of all sensors can be retrieved via Modbus protocol. A detailed protocol description is enclosed with each DS 400 instrument. When using the Ethernet interface the IP address at DS 400 can be freely adjusted. As an alternative DS 400 waits for the address allocation by a DHCP server.