CS INSTRUMENTS GmbH

OneTemp pty ltd
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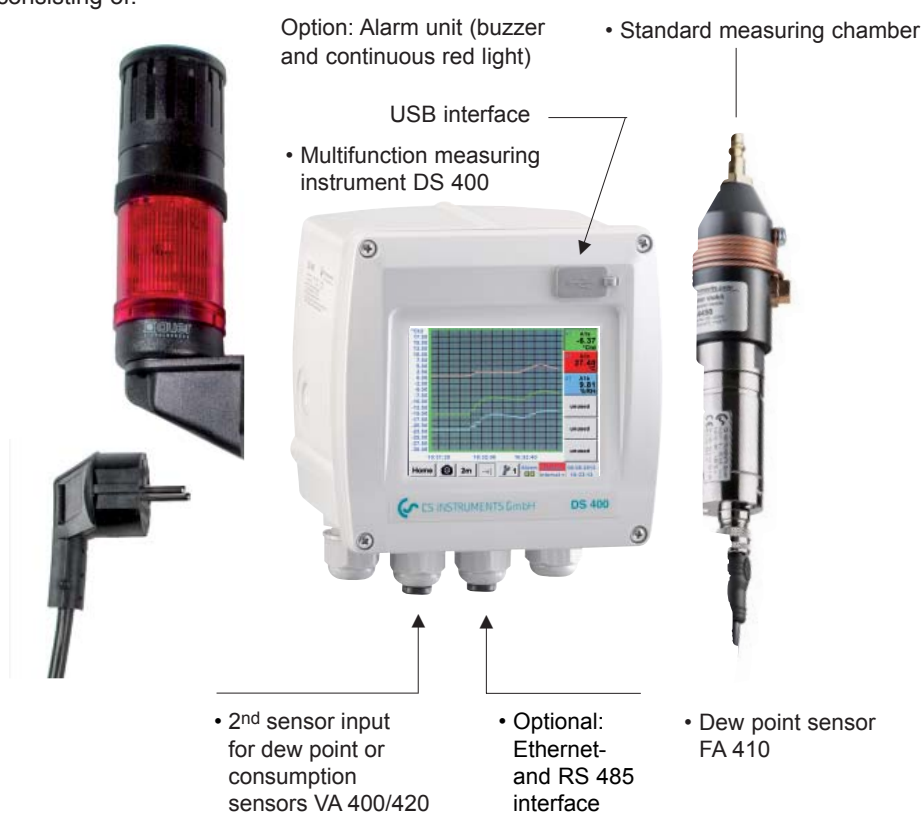
Dew point set
DS 400

Dew point set DS 400

for stationary dew point monitoring of refrigeration or adsorption dryers. 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.

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

Dew point set DS 400

consisting of:

Option: Alarm unit (buzzer and continuous red light)

• Standard measuring chamber

USB interface

• Multifunction measuring instrument DS 400

• 2nd sensor input for dew point or consumption sensors VA 400/420

• Optional: Ethernet- and RS 485 interface

• Dew point sensor FA 410

Option: Integrated data logger
- Recording of the dew point progression of up to 100 million meas. 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

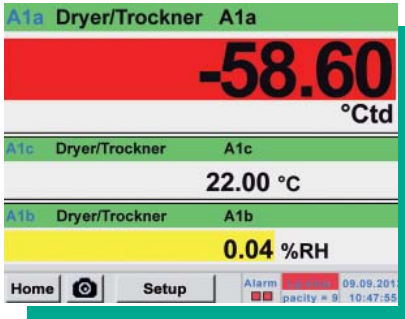|	
Dimensions:	118 x 115 x 98 mm, IP 54 (wall housing) 92 x 92 x 75 mm, IP 54 (panel mounting)
Inputs:	2 digital inputs for FA 410 resp. VA 400/420
Interface:	USB
Power supply:	100...240 VAC, 50-60 Hz
Accuracy:	please see FA 410
Alarm outputs:	2 relays, (pot.-free)
OPTIONS	
Data logger:	100 million meas. values start/stop time, meas. 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, Pt100, Pt1000

Description	Order no.
Dew point set DS 400 for adsorption dryers (-80…+20°Ctd)	0601.0410
Dew point set DS 400 for refrigeration dryers (-20…+50°Ctd)	0601.0412
Options	
Option: Integrated data logger for 100 million measured values	Z500.4002
Option: Integrated Ethernet and RS 485 interface	Z500.4004
Option: 2 additional sensor inputs for analogue sensors (pressure sensors, temperature sensors and so on)	Z500.4001
Option: Integrated webserver	Z500.4005
Further accessories	
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data from DS 400 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 including ISO certificate	0699.3396
Precision calibration at +3 °Ctd including ISO certificate	3200.0003

Technical data FA 410

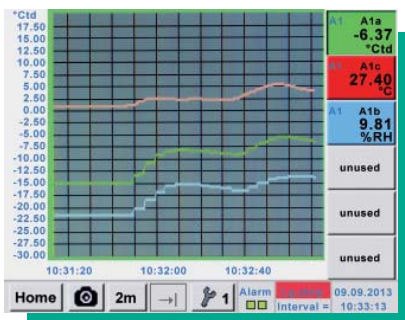|	
Meas. range:	-80...20°Ctd resp. -20...50°Ctd
Accuracy:	± 1°C at 20...-20°Ctd ± 2°C at -20...-50°Ctd ± 3°C at-50...-80°Ctd
Pressure range:	-1...50 bar, special version up to 350 bar

Easy operation via touch screen

Actual measured values

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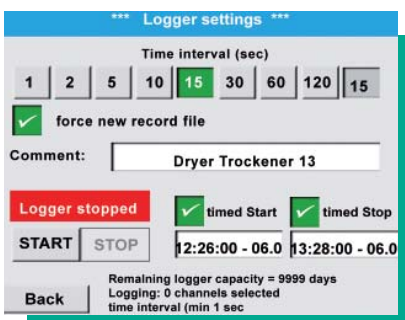Threshold exceedings are indicated in red colour.
A "measuring site name" can be allocated to each sensor.

Graphic view

In the graphic view all measured values are indicated
as curves.
It is possible to browse 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).
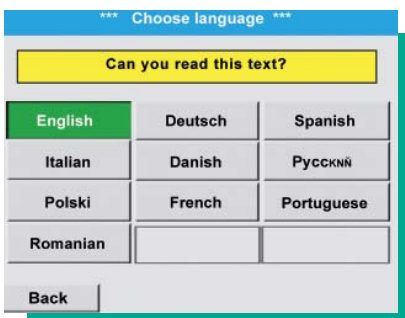

Data logger

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.

Selection of the language

DS 400 "speaks" several languages. The required language
can be selected by means of the select button.
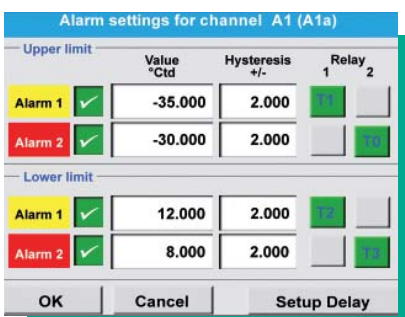
Adjustment of the alarm relays

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 - Multifunction measuring instrument

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)

Technical data DS 400

Dimensions:	118 x 115 x 98 mm, IP 54 (wall housing) 92 x 92 x 75 mm, IP 54 (panel mounting)
Inputs:	2 digital inputs for FA 410 resp. VA 400
Interface:	USB
Power supply:	100...240 VAC, 50-60 Hz
Accuracy:	see FA 410
Alarm outputs:	2 Relays, (pot.-free)
OPTIONS	
Data logger:	100 million meas. values start/stop time, meas. 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, Pt100, Pt1000

The sensor inputs 1+2 as well as 3+4 can be selected according to the required sensors:

Digital	Digital	Digital	Digital	Analogue	Analogue	Analogue	Analogue
m³/h, m³	°Ctd	A, kW/h	variable	bar	A	°C	°C

MOD BUS

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 ana-logue output

Description			Order no.
DS 400 - Multifunction measuring instrument with graphic display and touch screen	Sensor input 1+2	Sensor input 3+4	
	Digital	----------	0500.4000 D
	Digital	Digital	0500.4000 DD
	Digital	Analogue	0500.4000 DA
	Analogue	----------	0500.4000 A
	Analogue	Analogue	0500.4000 AA

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: "Mathematics calculation function" for 4 freely selectable channels, (virtual channels): addition, subtraction, division, multiplication	Z500.4007
Option: "Totalizer function for analogue signals"	Z500.4006

Further accessories	
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data of DS 400 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

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

| Description	Order no.
VA 400 flow sensor in basic version: Standard (92.7 m/s), sensor length 220 mm, without display	0695 4001
Optionsn for VA 400:	
Max. version (185 m/s)	Z695 4003
HighSpeed 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
Consumption counter VA 420:	
Consumption counter VA 420 with integrated measuring section (R $^1/_4$" DN 8)	0695 0420
Consumption counter VA 420 with integrated measuring section (R $^1/_2$" DN 15)	0695 0421
Consumption counter VA 420 with integrated measuring section (R $^3/_4$" DN 20)	0695 0422
Consumption counter VA 420 with integrated measuring section (R 1" DN 25)	0695 0423
Consumption counter VA 420 with integrated measuring section (R $1^1/_4$" DN 32)	0695 0426
Consumption counter VA 420 with integrated measuring section (R $1^1/_2$" DN 40)	0695 0424
Consumption counter VA 420 with integrated measuring section (R 2" DN 50)	0695 0425
Dew point sensors:	
FA 410 dew point sensor, -80°...20°Ctd including inspection certificate	0699 0410
FA 415 dew point sensor, -20°...50°Ctd including inspection certificate	0699 0415
Standard measuring chamber for compressed air up to 16 bar	0699 3390
Connection cables for VA 400, VA 420, FA 410 and FA 415: **Connection cables for flow sensors / dew point sensors**	
Connection cable 5 m	0553 0104
Connection cable 10 m	0553 0105
Pressure sensors:	
Standard pressure sensor CS 16, 0...16 bar, ± 1 % accuracy of full scale	0694 1886
Standard pressure sensor CS 40, 0...40 bar, ± 1 % accuracy of full scale	0694 0356
Further pressure sensors please see complete catalogue	
Temperature sensors:	
Screw-in temperature sensor Pt 100, Class A, length 300 mm, Ø 6 mm, with measuring transducer 4...20 mA = 50...+500°C (2-wire-technology)	0693 0002
Temperature probe cable Pt 100, Class A, length 300 mm, Ø 6 mm, -50...+180°C, 5 m probe connection cable with open ends	0604 0102
Temperature probe cable Pt 100, Class A, length 150 mm, Ø 6 mm, -50...+180°C, 5 m probe connection cable with open ends	0604 0100
Clamp screwing 6 mm, G1/2", VA clamping ring, 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...400 A TRMS incl. 3 m connection cable with open ends	0554 0510
Clamp-on ammeter 0...1000 A TRMS incl. 5 m connection cable with open ends	0554 0507
Optional third-party sensors 0/4...20 mA, 0...1/10/30 V, PT 100 / PT 1000, KTY, pulse, **RS 485 Modbus connectible.**	

Consumption

Consumption
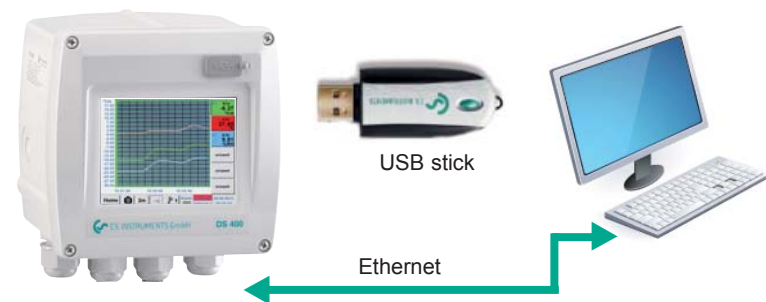
Dew point

Pressure

Temperature

Power

Current / effective power meter

| Description	Order no.
CS PM 710 current/effective power meter for panel mounting, current transformer from 100 A to 2000 A connectible	0554 5343
Current transformer 100/5 A connectible to current/effective power meter for panel mounting (for cabels up to Ø 21 mm)	0554 5344
Current transformer 200/5 A connectible to current/effective power meter for panel mounting (for cabels up to Ø 21 mm)	0554 5345
Current transformer 300/5 A connectible to current/effective power meter for panel mounting (for cabels up to Ø 22 mm)	0554 5346
Current transformer 500/5 A connectible to current/effective power meter for panel mounting (for cabels up to Ø 22 mm)	0554 5347
Current transformer 600/5 A connectible to current/effective power meter for panel mounting (for cabels up to Ø 22 mm)	0554 5348
Current transformer 1000/5 A connectible to current/effective power meter for panel mounting (for current bar up to 65 x 32 mm)	0554 5349
Current transformer 2000/5 A connectible to current/effective power meter for panel mounting (for current bar up to 127 x 38 mm)	0554 5350
Connection cable to DS 400, 5 m, with open ends	0553 0108
Connection cable to DS 400, 10 m, with open ends	0553 0109

Digital data transfer to DS 400
via RS 485 - Modbus
Voltage measurement

L1
L2
L3
N
Current transformers
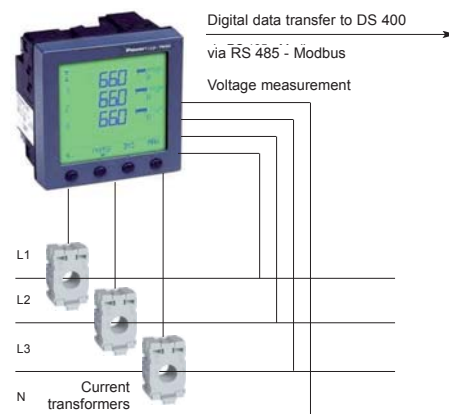
CS Soft Basic - evaluation of measured data for single computers

USB stick

Ethernet

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.
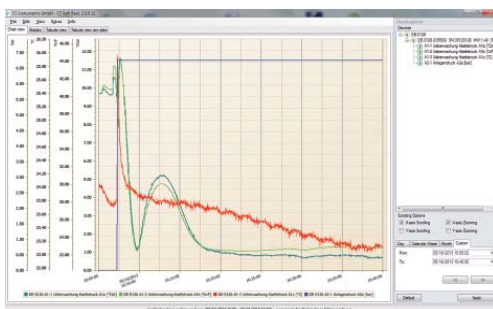
Graphic evaluation

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 common file.

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.

Statistics

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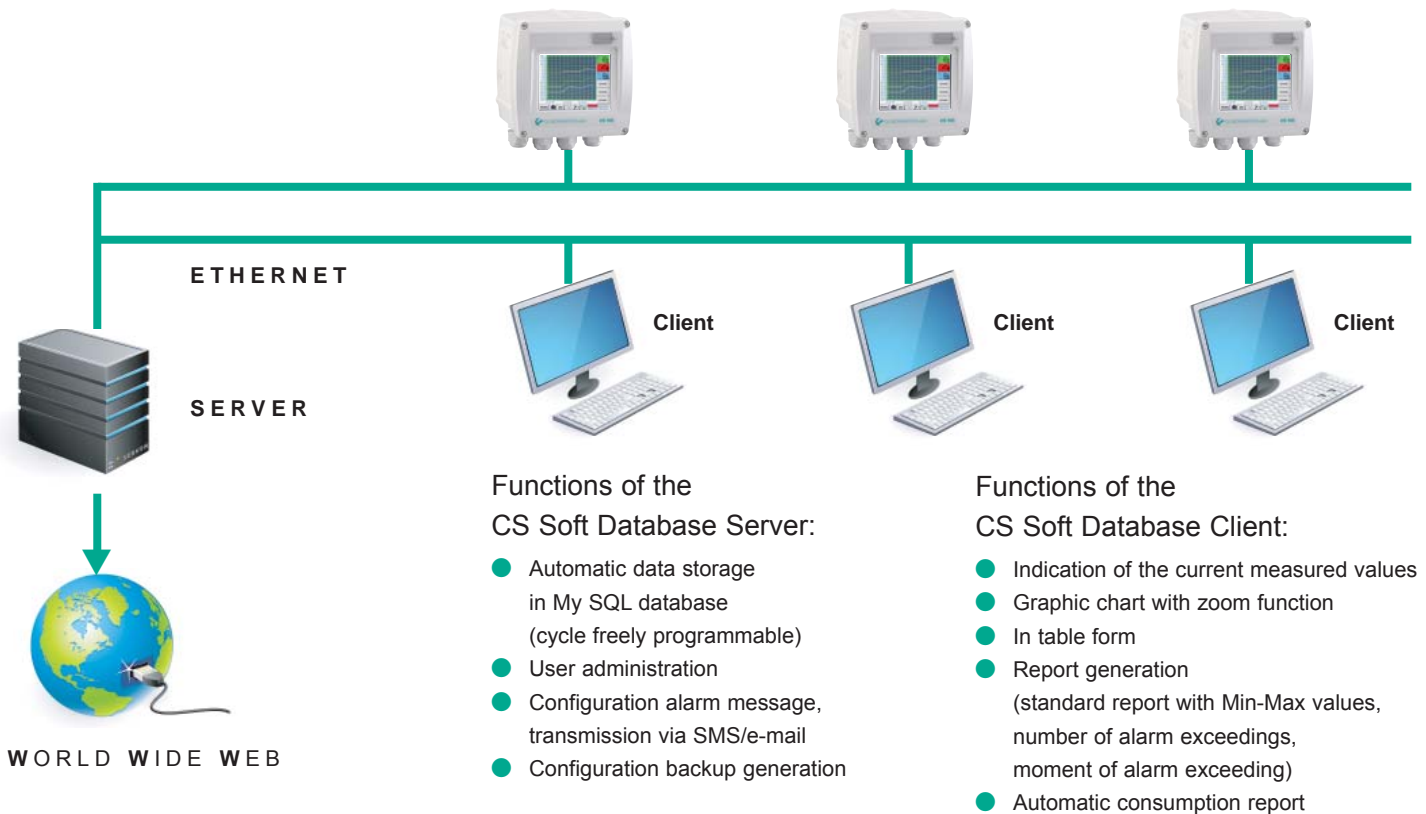

Consumption evaluation

The software carries out a consumption 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 Database Client/ Server Solution 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 given alarm thresholds 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 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.
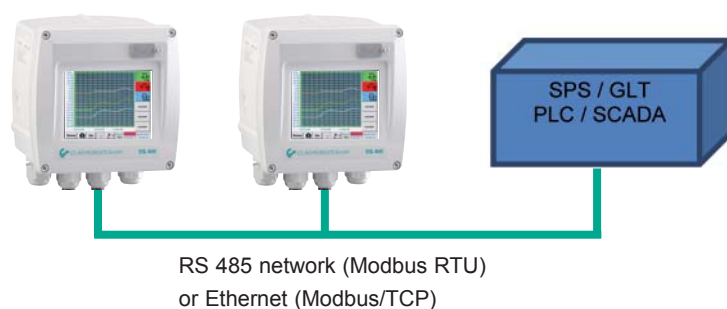
ETHERNET

SERVER

Client

Client

Client

WORLD WIDE WEB

Functions of the
CS Soft Database Server:

- Automatic data storage in My SQL database (cycle freely programmable)
- User administration
- Configuration alarm message, transmission via SMS/e-mail
- Configuration backup generation

Functions of the
CS Soft Database Client:

- Indication of the current measured values
- Graphic chart with zoom function
- In table form
- Report generation (standard report with Min-Max values, number of alarm exceedings, moment of alarm exceeding)
- Automatic consumption report

Access to the measured values via the webserver

World Wide Web

Ethernet

With the option "Webserver" (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 webserver 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 systems

SPS / GLT
PLC / SCADA

RS 485 network (Modbus RTU)
or Ethernet (Modbus/TCP)

With the option "Ethernet / RS 485 - interface" (order no. Z500.4004) DS 400 can be connected to customer-owned Bus systems (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.

Innovations:
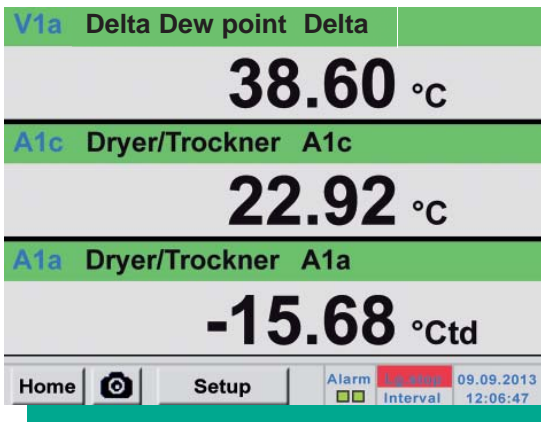
Measurement of the dew point span

Especially in case of extremely warm weather it can be useful not only to take a look at the dew point temperature of compressed air but also to the difference between air temperature and dew point temperature. For this purpose a temperature sensor is connected to DS 400 in addition to the dew point sensor.

The dew point span (=difference = temperature - dew point) can be calculated by means of the option "Mathematics calculation function" (order no. Z500.5008).
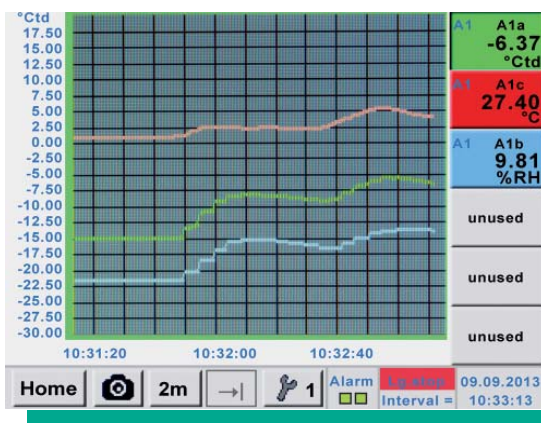
If the dew point span gets too low condensate may occur. The calculated measuring channel "dew point span" can of course also be allocated to an alarm relay.

Reset of the alarm relay

In case of a connected buzzer it is helpful if the alarm can be reset by the responsible person.

For each alarm relay in DS 400 it can be determined whether the alarm is resettable or not.

Print function

By means of the print key it is possible to store the actual screen as an image file onto the internal SD card or on a USB stick and print it out at the PC without any additional software.

This is ideal for documentation of the measured values/ measured curves on-site. Coloured measured curves can be sent as image files by e-mail or integrated into a service report.

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