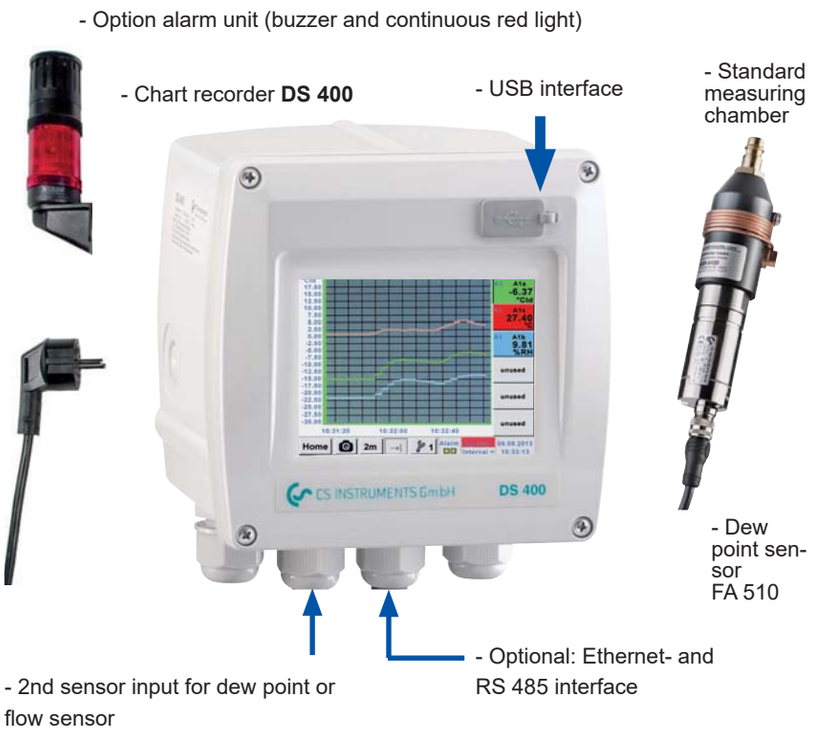
Dew point monitoring **DS 400**

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 monitoring DS 400

consisting of:



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

Description	Order No.
Dew point monitoring DS400 for desiccant driers (-80...20° Ctd.)	**0601 0510**
Dew point monitoring 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

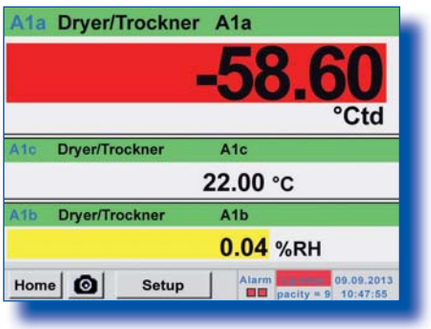
Technical data DS 400

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

Easy operation via touch screen



Actual measured values

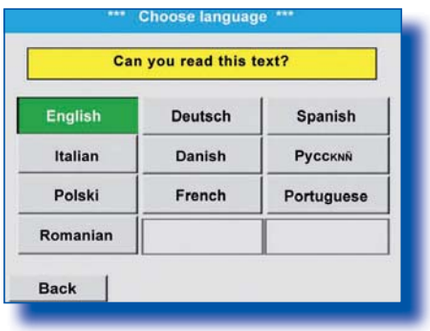
All measured values can be seen at a glance.
Threshold exceeding are indicated in red color.
A „measuring site name“ can be allocated to each sensor.

Graphic view

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

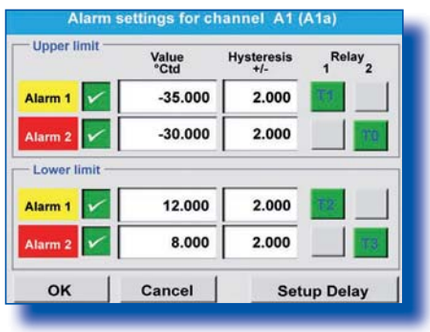
Data logger

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 - 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
m³/h, m³	°Ctd	A, kW/h	optional	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/ effective power meter	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			
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 for RS 485 interface connection			Z500 3008
Further accessories			
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

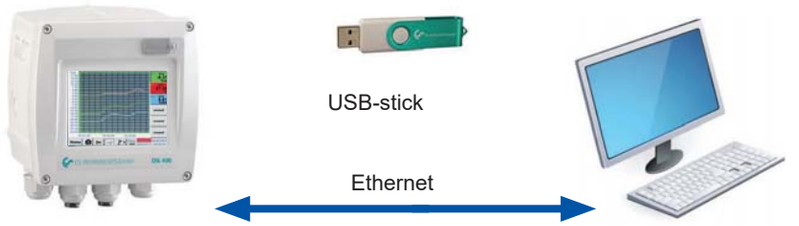
Input signals	
Current signal internal or external power supply Measuring range Resolution Accuracy Input resistance	(0...20mA/4...20mA) 0...20 mA 0.0001 mA ± 0.03 mA ± 0.05 % 50 Ω
Voltage signal Measuring range Resolution Accuracy Input resistance	(0...1 V) 0...1 V 0.05 mV ± 0.2 mV ± 0.05 % 1 MΩ
Voltage signal Measuring range Resolution Accuracy Input resistance	(0...10 V / 30 V) 0...10 V 0.5 mV ± 2 mV ± 0.05 % 1 MΩ
RTD Pt 100 Measuring range Resolution Accurancy	 -200...850°C 0.1°C ± 0.2°C (-100...400°C) ± 0.3°C (further range)
RTD Pt 1000 Measuring range Resolution Accuracy	 -200...850°C 0.1°C ± 0.2° (-100...400°C)
Pulse Measuring range	 min pulse length 500 µs frequency 0...1 kHz max. 30 VDC

Suitable sensors for DS 400

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	
Options for VA 500: (see page 81)		
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:		
Screw-in temperature probe PT 100 class A, length: 300 mm, d=6mm, with integrated transducer 4…20 mA = -50°C…+500°C (2-wire)	0604 0201	
Outdoor temperature probe, PT 100 class B (2-wire) in wall housing (82x55x33 mm), temperature range: -50°C to +80°C	0604 0203	
Indoor temperature probe, PT 100 class B (2-wire) in wall housing (82x55x33 mm), temperature range: -50°C to +80°C	0604 0204	
Temperature probe PT 100 class A (4-wire) with cable, length: 300 mm, d=6 mm, -70°C to +260°C, 5 m connection cable (PFA) with open ends	0604 0205	
Temperature probe PT 100 class A (4-wire) with cable, length: 100 mm, d=6 -70°C to +260°C, 5 m connection cable (PFA) with open ends	0604 0206	
Temperature probe PT 100 class A (4-wire) with cable, length: 200 mm, d=6 -70°C to +260°C, 5 m connection cable (PFA) with open ends	0604 0207	
Surface temperature probe, magnetic, magnet dimensions 39x26x25 mm, PT 100 class B (2-wire), -30 to +180°C, 5 m connection cable (PFA) with open ends	0604 0208	
Clamp screwing 6mm; G 1/2“ PTFE clamp ring pressure tight up 10 bar material: stainless steel, temperature range: max. +260°C	0554 0200	
Clamp screwing 6mm; G 1/2“ stainless steel clamp ring pressure tight up to 16 bar, material: stainless steel, temperature range: max. +260°C	0554 0201	
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	
Current / effective power meter (further current transformer please see on page 10)		
CS ENERIUM 30 current/effective power meter for panel mounting, current transformer from 100 A to 2000 A connectable	0554 5355	
Current transformer 100/5 A connectable 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	

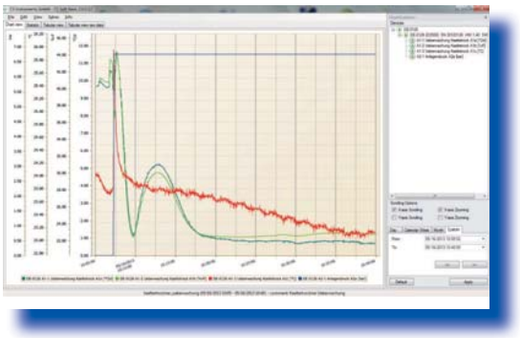
Dew point

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 colors. All necessary functions like free zoom, selection/deselection of single measured curves, free selection of time periods, scaling of the axis, selection of colors 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.

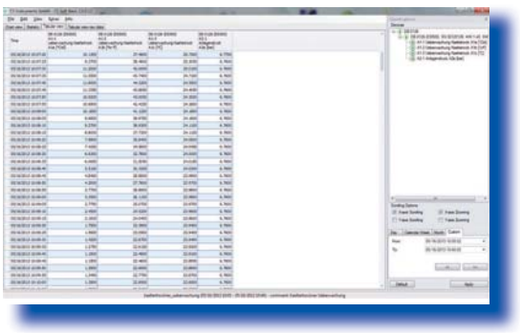
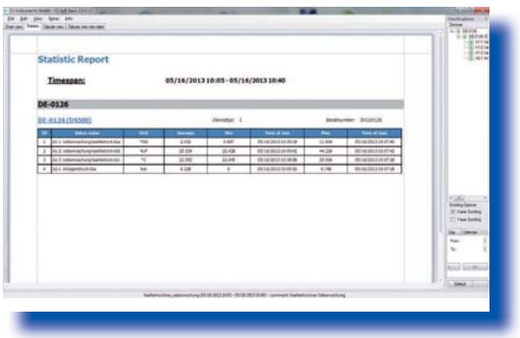


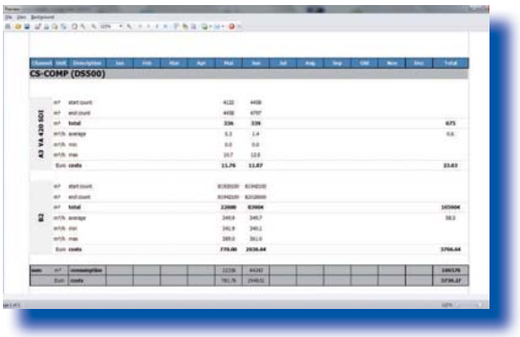
Table view

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 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.



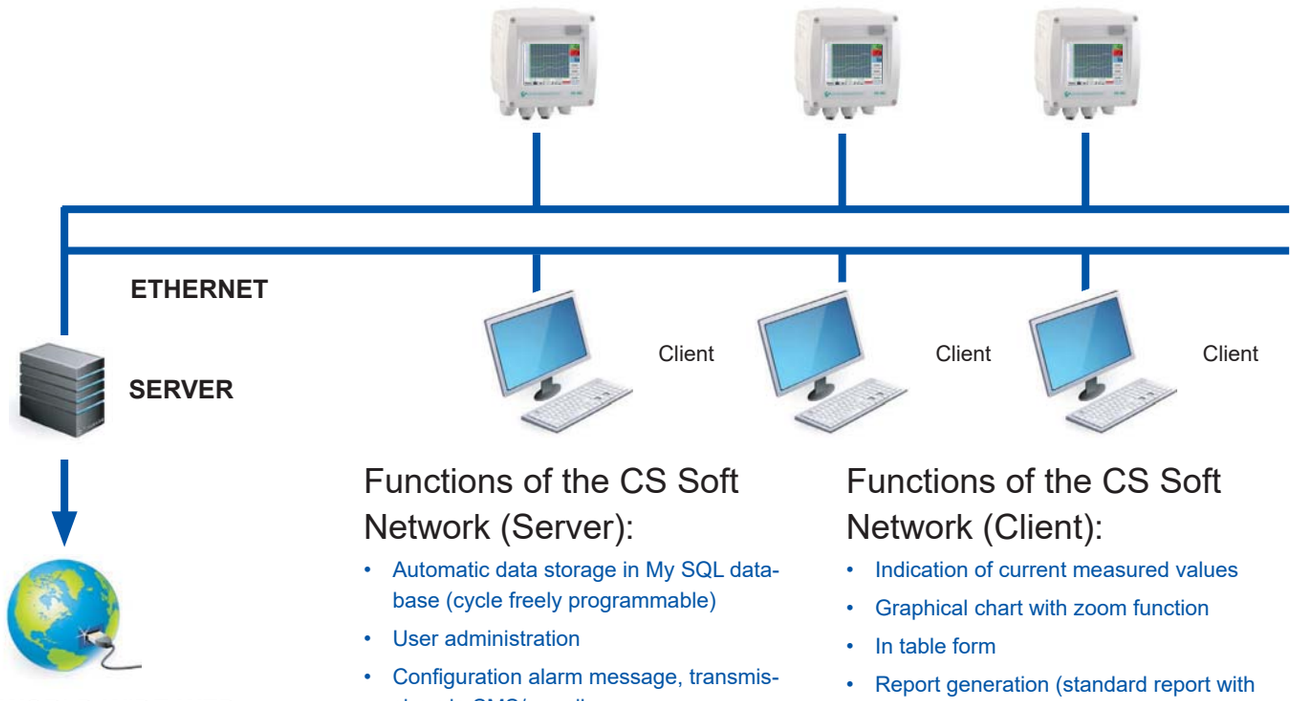
Energy and flow evaluation

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.



Functions of the CS Soft Network (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 Network (Client):

- Indication of current measured values
- Graphical 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

With the option „Webserver“ (order no. Z500 4005) DS 400 can be contacted without any special software from each web browser (eg. 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 system

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 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.