LD 500/510 – Leak detector with camera – shows leakage rate in l/min and cost in €

NEW:
Multi-user capable through cloud solution

NEW:
Unique laser distance measurement for automatic cost determination

Find out your leakage rate (l/min or cfm) and potential savings (€ /year). Currency can be set as required

Find the smallest leaks at large distances

NEW:
Automatic sensor detection

Auto level: Automatically adapts the sensitivity to the environment and reliably eliminates ambient noise

Photograph leaking parts

Paperless documentation.
Enter everything into the device on site: Define the leakage location as well as the remedial measures and spare parts required

Transmit the leakage data via USB to your desktop software

Create a report in accordance with ISO 50001

9 hours of continuous operation possible

Fatigue-free work –
ergonomic, one-hand operation – low weight

FINDING LEAKS PAYS OFF:

Sample calculation for a medium-sized company:

Approx. 25% of compressed air is lost due to leaks
Installed compressor capacity 150 kW(el) x 6000 OpHrs x € 0.12/kWh
Annual electricity costs: **€ 180,000**

25% leakage cost: **27,000 €** per year!

Use the reporting software to quickly and efficiently produce an ISO 50001 report

CS Leak Reporter – cloud solution

Ideal for leak detection service providers and for companies/ major corporations with multiple locations.

- Each “user” in the leakage search team can be assigned a role (e.g. leakage search, leakage repair, monitoring, checking for success)
- Access rights to individual or all projects can be assigned individually to each user
- The browser-based software ensures a common database in real time and paperless documentation

CS Leak Reporter – PC solution

Creates detailed ISO 50001 reports. Provides an illustrated overview of the leaks found and their savings potential. Measures for elimination, including status display, can be defined for every leak – license for two computers

Leakage Report	Start: 15/04/2019	End: 25/04/2019	Duration: 10 day(s)
Contact details:	**Customer:**	**Auditor:**	
Company:	Acme	John Sample	
Address:	...	1 Sample St., 12345 Sampletown	
E-mail:	johnacme@sample.com	j.sample@acme.com	
Phone:	...	+49 1234 567890	
Logo:			
Project master data:			
Import date:		CO_2 emissions:	0.527 kg/kWh
Cost calculation basis:	Energy costs (70%)	Specific output:	0.12 kWh/m³
Compressed air costs:	21.6 €/1000 m³	Electricity price:	0.18 €/kWh
Operating hours per year:	4350 h		
Results:		**Improvements:**	
Number of leaks:	141	Number remedied:	1
Total leakage amount:	718.126 ltr/min	Leakage amount saved:	3.468 ltr/min
Total costs per year:	4,048.49 €	Costs saved per year:	19.55 €
Total CO_2 per year:	11.91 tonnes	CO_2 saved per year:	0.06 tonnes

Leak tag: 1

Building – location	COMPRESSOR ROOM 1	**Repair under pressure possible? -** No
Date and time:	15/04/2019 12:06:03	**Error:** Ball valve defective
Leakage rate:	< 1.395 ltr/min	**Spare part:** 1/2" ball valve
Costs per year:	< 7.86 €	**Action:** Replace
Total CO_2 per year:	0.02 tonnes	**Note:** -
Priority:	Low	**Status:** Open
Comment:	Replace ball valve	**Remedied on:** - **Remedied by:** -

Leak tag: 2

Building – location		**Repair under pressure possible? -** No
Date and time:	15/04/2019 12:08:19	**Error:** Flange leaking
Leakage rate:	2.519 ltr/min	**Spare part:** DN 100 flange seal
Costs per year:	14.2 €	**Action:** Reestablish seal
Total CO_2 per year:	0.04 tonnes	**Note:** -
Priority:	High	**Status:** Done
Comment:	Reestablish flange seal	**Remedied on:** 16/04/2019 **Remedied by:** AM

Sensors:

Acoustic trumpet

Focuses the sound waves of small leaks, thereby amplifying the audible noise. The laser enables precise detection. Integrated laser distance measurement

Parabolic mirror

For leak detection at great distances. Laser pointer and camera integrated

Focus tube with focus tip

For pinpoint detection of the smallest leaks in confined spaces

Gooseneck

Enables pinpoint detection of the leak in places that are difficult to access. Background noise is faded out

Accessories:

Headset

The noise-proof headset enables leak detection even in an extremely loud environment. The ambient noise is faded out, and the leakage (inaudible ultrasonic sound) is transformed into an audible signal

Holster with shoulder strap

For the LD 500/510, enables ergonomic and safe work

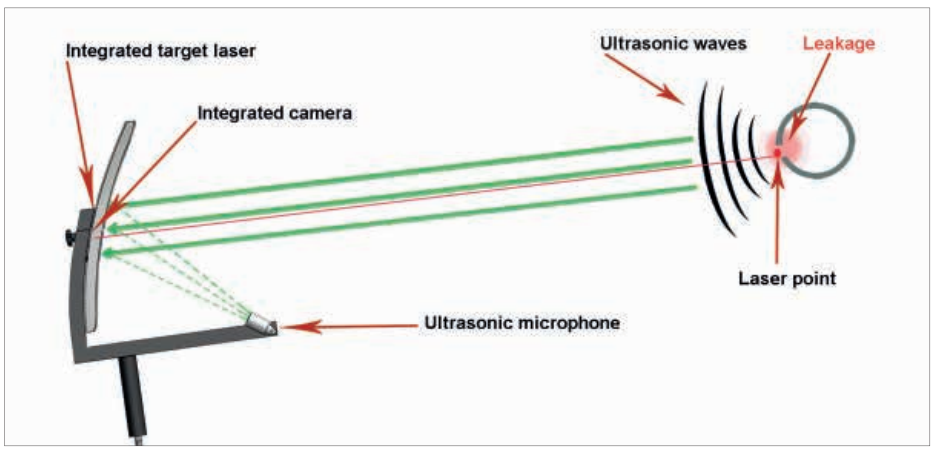
Leak tags

As hardcopies for documentation on site

Ultrasonic tone generator

A handy ultrasonic tone generator is available for detecting leaks in systems that are not under pressure. The transmitter is positioned so that the sound can enter the pipe system. The ultrasonic signal penetrates the smallest openings, which can then be detected with the LD 500

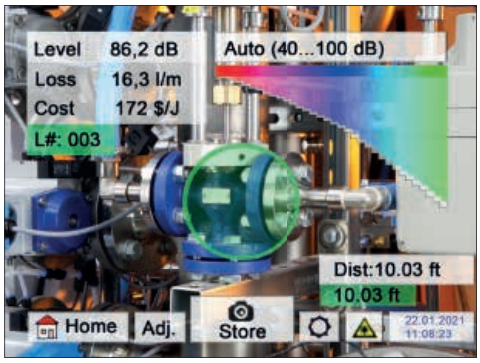
Professional accessory – parabolic mirror



By focusing the ultrasonic waves in the parabolic mirror, even the smallest leaks of 0.8 l/min (approx. € 8 p.a.) can be located with pinpoint precision (± 15 cm) at a distance of up to 10 to 15 m.

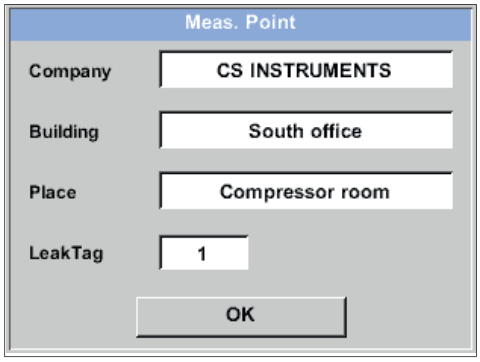
The shape of the parabolic mirror ensures that only ultrasonic waves of the targeted leak are evaluated. Background noise is reduced to a minimum.

Easy documentation in the device directly on site



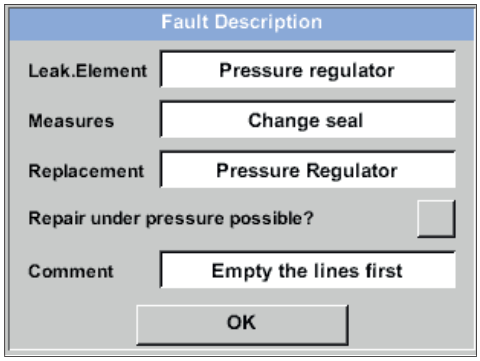
Detect a leak

The device indicates the leakage rate in (l/min or cfm) and the savings potential in (€ /year) on the display. Currency can be set as required. This data is saved together with the photo.



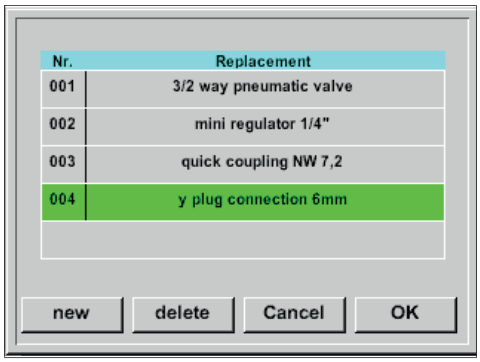
Define the location

The location of each leak can be stored:
Company / building / location



Remedy the leak

Efficiency and clarity also for elimination of leaks. Definition of the necessary spare parts and maintenance work already on site.



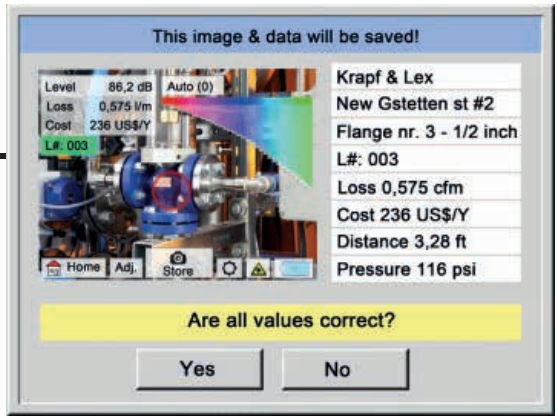
Spare parts list in the device

The software can be used to transfer a custom spare parts list to the device. The device offers an intelligent search function with auto-complete feature.
The list with the required spare parts can be exported from the CS Leak Reporter software.

The LD 500/510 in detail

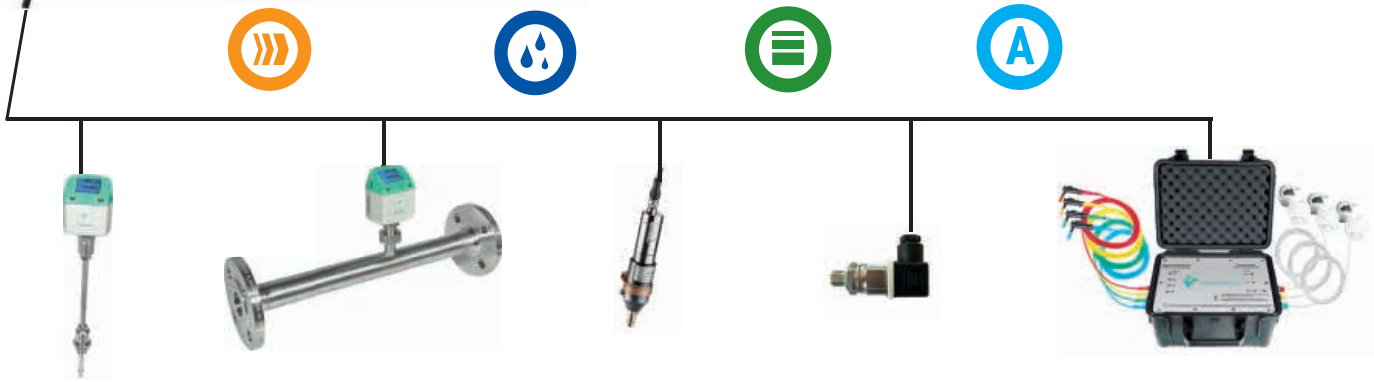
The new leakage meters LD 500/LD 510 with integrated camera and leakage calculation are ideal measuring devices which help to easily find and document even the smallest leaks (0.1 l/min corresponds to approx. € 1 per year) even at great distances.

LD 510 is the world's first leakage meter with an additional freely assignable sensor input for all CS sensors. In addition to leakage measurement and detection, all necessary measurements relating to dew point, flow, pressure, temperature, ... can also be carried out.



Leak detection on:

- Compressed air and pneumatic systems (up to 40 bar) and vacuum systems
- Technical gases such as nitrogen, oxygen, argon, ...
- Leak testing of containers (including unpressurised containers) using an ultrasonic transmitter



Flow meter **VA 500**

Flow meter **VA 520**

Dew point sensor **FA 510**

Pressure sensor

Current/effective power meters

Costs per year						
Pressure	Size of leak – diameter (mm)					
	0.5 mm	1.0 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
3 bar	€ 90	€ 361	€ 812	€ 1,444	€ 2,256	€ 3,248
4 bar	€ 113	€ 451	€ 1,015	€ 1,805	€ 2,820	€ 4,061
5 bar	€ 135	€ 541	€ 1,218	€ 2,166	€ 3,384	€ 4,873
6 bar	€ 158	€ 632	€ 1,421	€ 2,527	€ 3,948	€ 5,685
7 bar	€ 180	€ 722	€ 1,624	€ 2,888	€ 4,512	€ 6,497
8 bar	€ 203	€ 812	€ 1,827	€ 3,248	€ 5,076	€ 7,309

Table: Leakage costs in one year with 24-hour operation 365 days per year calculated with compressed air costs of 1.9 ct/Nm³.

Transport case – LD 500/510

Transport case – Parabolic mirror

TECHNICAL DATA OF THE LD 500 / LD 510	
Operating frequency:	40 kHz ± 2 kHz
Connections:	3.5 mm stereo jack for headset, power supply socket for connecting an external charger
Laser:	Wavelength: 630…660 nm Output power: < 1 mW (laser class 2)
Display:	3.5" touch screen
Interface:	USB interface
Data logger:	16 GB SD memory card (100 million values)
Power supply:	Internal rechargeable Li-Ion batteries, approx. 9 h continuous operation, 4 h charging time
Ambient temperature:	0…+50 °C
EMC:	DIN EN 61326
Auto level:	Automatically adapts the sensitivity to the environment and reliably eliminates ambient noise
Sensitivity:	min: 0.1 l/min at 6 bar, 5 m distance, approx. € 1/year of compressed air costs
Weight without headset:	540 grams

TECHNICAL DATA OF EXTERNAL SENSOR INPUT (LD 510 ONLY)	
Measuring range:	See external CS sensors
Accuracy:	See external CS sensors
Power supply:	Output voltage: 24 VDC ± 10% Output current: 120 mA in continuous operation

DESCRIPTION	ORDER NO.
LD 500 set consisting of:	0601 0105
LD 500 leak detector with acoustic trumpet and integrated camera,100 leak tags for marking the leaks on site	0560 0105
NEW: Integrated laser distance measurement	Z554 5000
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
AC adapter plug	0554 0009
Spiral cable for connecting the ultrasonic sensor, length 2m (extended)	020001402
Holster with shoulder strap for LD 500/510	020001795

DESCRIPTION	ORDER NO.
LD 510 set consisting of:	0601 0106
LD 510 leak detector incl. acoustic trumpet, with integrated camera and additional input for external sensors, 100 leak tags for marking the leaks on site	0560 0106
NEW: Integrated laser distance measurement	Z554 5000
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
AC adapter plug	0554 0009
Spiral cable for connecting the ultrasonic sensor, length 2m (extended)	020001402
Holster with shoulder strap for LD 500/510	020001795

Accessories

DESCRIPTION	ORDER NO.
Gooseneck for leak detection at sites which are difficult to access (length 600 mm)	0530 0105
Gooseneck for leak detection at sites which are difficult to access (length 1500 mm)	0530 0108

DESCRIPTION	ORDER NO.
Parabolic mirror for leak detection at long distances, incl. transport case	0530 0106

DESCRIPTION	ORDER NO.
Ultrasonic tone generator for leak testing	0554 0103

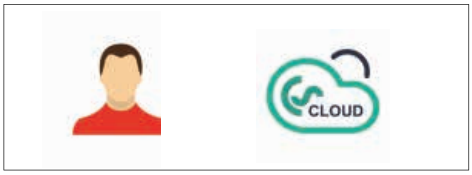
DESCRIPTION	ORDER NO.
500 leak tags for marking the leaks on site	0530 0107

Software

DESCRIPTION	ORDER NO.
CS Leak Reporter V2 Creates detailed ISO 50001 reports. Provides an illustrated overview of the leaks found and their savings potential. Measures for elimination, including status display, can be defined for every leak – license for two computers New functions: - Simple spare parts management - Histogram functions for documenting continuous improvement in accordance with ISO 50001 on the company or building level	0554 0205

DESCRIPTION	ORDER NO.
CS Leak Reporter V2 – additional licence for one computer	Z554 0205CS

DESCRIPTION	ORDER NO.
CS Leak Reporter – cloud solution Basic package: Browser-based access to the CS Cloud. Advantages: - Common database of all users in real time. - Cross-location work in a team - Paperless documentation. - Unlimited number of guest logins (read-only rights) can be set up. Only available in combination with at least one CS Cloud (0554 0306) user licence.	0554 0305



DESCRIPTION	ORDER NO.
User licence – CS Cloud 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0306

LD 500/510 calibration

DESCRIPTION	ORDER NO.
LD 500/LD 510 re-calibration	0560 3333

Additional sensors / accessories for connection to LD 510

DESCRIPTION	ORDER NO.
FA 510 dew point sensor for mobile devices, -80...+20 °Ctd incl. mobile measuring chamber, 5 m connection cable and perforated protection cap	0699 1510
VA 500 flow probe, max. version (185 m/s), probe length 220 mm, incl. 5 m connection cable	0695 1124
Standard pressure probe CS 16, 0…16 bar, ± 1% accuracy of f.s.	0694 1886
Differential pressure probe 1.6 bar diff.	0694 3561
Connection cable for pressure, temperature or external sensors on mobile instruments, 5 m	0553 0501
CS Basic – data evaluation in graphic and table form – readout of the measured data via USB or Ethernet. License for two workstations	0554 8040

Leak detector LD 400

If gases escape through leaks in pipe systems (e.g. non-tight screwed connections, corrosions and so on), ultrasonic noises are generated. By means of LD 400, even the smallest leakages which cannot be heard by the human ear and which are not visible due to their size can be detected even from distances of several meters. LD 400 transforms the inaudible signals into a frequency which can be identified. By means of the comfortable sound-proof headset, these noises can be detected even in extremely noisy environments. The LD 400 leak detector is the advancement of the proven LD 300, and it impresses with its significantly refined sensor technology and its improved support in the tracing of leaks. By means of the integrated laser pointer, which serves for target heading, the leak can be localised more accurately.

The LD 400 meets the requirements of class I instruments for the norm **"Standard Test Method for Leaks with Ultrasound"** (ASTM Int. - E1002-05)

Applications

Leak detection on:

- compressed air, gas, vapour and vacuum systems
- Door seals

LD 400 with straightening tube and straightening tip for accurate detection.

Sound-proof headset:
Enables leak detection in an extremely loud environment

Costs per year						
	Size of leakage - diameter (mm)					
Pressure	0.5 mm	1.0 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
3 bar	€90	€361	€812	€1,444	€2,256	€3,248
4 bar	€113	€451	€1,015	€1,805	€2,820	€4,061
5 bar	€135	€541	€1,218	€2,166	€3,384	€4,873
6 bar	€158	€632	€1,421	€2,527	€3,948	€5,685
7 bar	€180	€722	€1,624	€2,888	€4,512	€6,497
8 bar	€203	€812	€1,827	€3,248	€5,076	€7,309

Table: Leakage costs within one year in case of operation 24 h/365 days, calculated with compressed air costs of 1.9 ct/Nm³.

Through the use of a specially designed acoustic trumpet, a better bundling of the sound waves is achieved. This trumpet acts like a directional microphone, suppressing unwanted noise and facilitating the pinpoint location of leaks even in hard-to-reach areas. Due to the special design of the acoustic trumpet, the use of the laser pointer is not hindered.
A handy ultrasonic transmitter is available for detecting leaks in pressureless systems. The transmitter is positioned so that the sound can enter the pipe system. The ultrasonic signal penetrates the smallest openings, which can then be detected with the LD 400.

Special features

- Robustness and low weight ensure fatigue-free use in industrial environments
- Improved detection of leakages with the acoustic trumpet
- Modern Li-Ion battery with high capacity, external charger
- Minimum operating time 10 h
- Easy operation via membrane keypad

LD 400 is available either as standalone device or in a complete set. The set includes a robust impact-proof transportation case which contains all necessary components and accessories.

DESCRIPTION	ORDER NO.
Set LD 400 consisting of:	0601 0104
LD 400 leak detector for compressed air systems	0560 0104
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
AC adapter plug	0554 0009
Acoustic trumpet	0530 0109
Accessories not included in the set: Ultrasonic transmitter	0554 0103

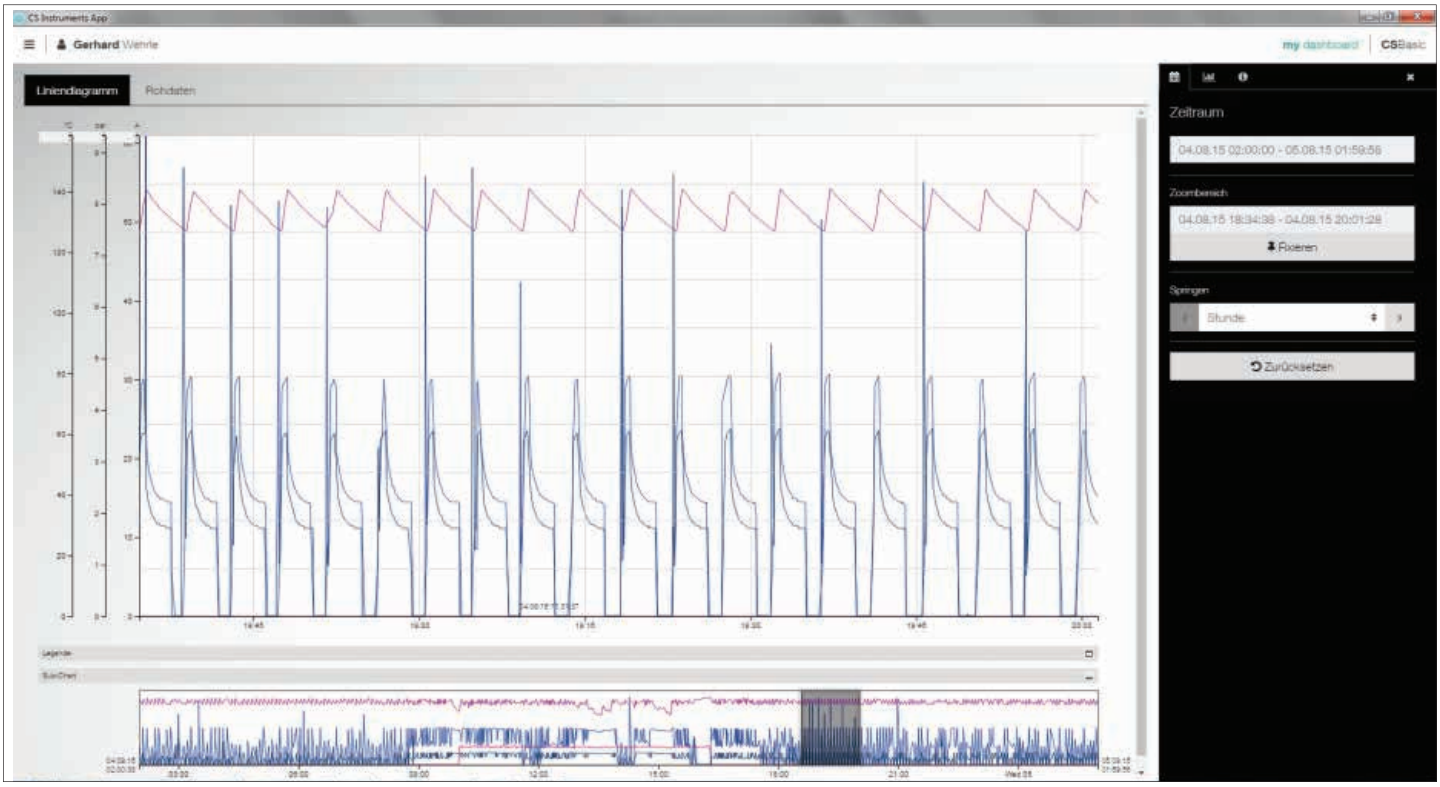
TECHNICAL DATA LD 400	
Operating frequency:	40 kHz ± 2 kHz
Connections:	3.5 mm stereo jack for headset. Power supply socket for connecting an external charger
Laser:	Wavelength: 645…660 nm Output power: < 1 mW (laser class 2)
Operating time:	10 h
Charging time:	approx. 1.5 h
Operating temperature:	0 to 40 °C
Storage temperature:	-10 °C to 50 °C

CS Basic

With the CS Basic, the chart recorder DS 500/400 and all mobile devices with data logger can be read out. Depending on the device, data transfer is performed either via USB stick or Ethernet connection.

CS Network

The CS Network is a client-server solution. The server software automatically collects the measured values of all CS chart recorders and CS sensors embedded in the company's computer network and stores them in a database. The evaluation / analysis of the measured data is carried out via the evaluation software (client) at any number of workstations.



	CS Basic	CS Network
Installation	Local PC installation	Server (virtual machine) Client (browser-based)
Data memory	Database (local)	Database (server, virtual machine)
Updates to new releases free of charge	Yes	Yes
Automatic notification of upgrades	Yes (only in case of Internet access)	Yes
Number of workstation licences	2	Unlimited
Number of measured values	All measured values that are transferred by a device. (max.1 device at the same time)	up to 20 / 50 / 100 / 200 measured values
Data transfer	USB stick (manually) or Ethernet	Ethernet
User management	No	Yes
E-mail in case of threshold value exceedance	No	Yes
Storage of measured data	Logger data must be read-out manually via CS Basic	CS Network automatically stores the measured data of all connected devices

Common functions:

Graphic evaluation

All measurement curves are indicated in colour. All necessary functions are integrated, such as free zoom, selection/deselection of single

measurement curves, free selection of periods, scaling of the axes, selection of colours and so on.
Different data can be combined in a shared file. This view can be saved as a PDF file and sent as an e-mail.

Table view

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

Statistics

All required statistic data are visible at a glance. So the user can see very quickly which minimal or maximal measured values occurred when and for how long.

Flow evaluation

The software carries out flow analysis for all connected flow meters, optionally as a daily, weekly or monthly analysis.

Data export according to MS-Excel® or csv

The measured data can be exported to Excel or csv.

Rates

The price per consumption unit can be can be stored for each energy form. Depending on the time and day, different tariffs can be stored. The validity of the tariffs can be defined via calendar function so that price increases or decreases can be updated.

Multilingualism

The user interface is included in German, English and further languages in the scope of delivery.

Alarm history / Alarm log file

The threshold value exceedance is documented with the CS Network.

Management of the measuring sites

Each CS sensor or each CS chart recorder can be assigned to a department/hall (or cost centre).

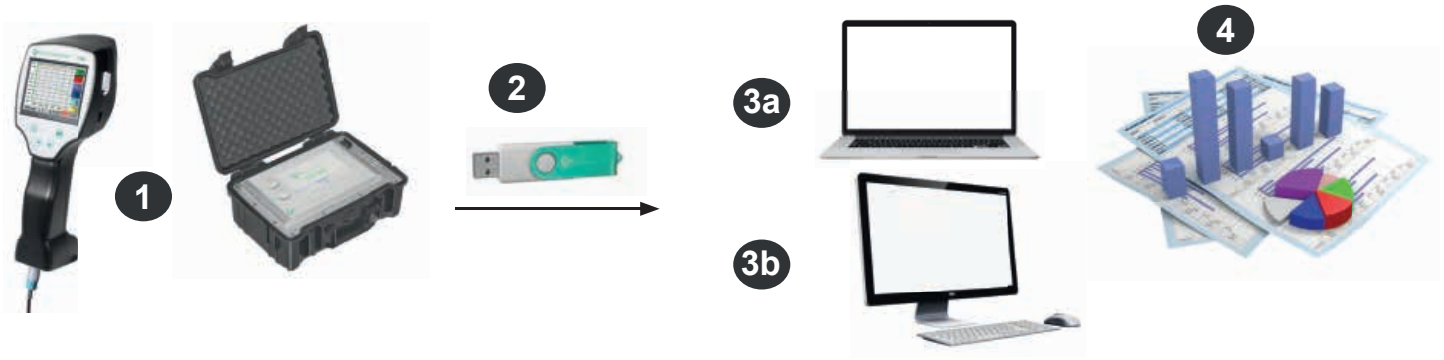
Optional add-on modules:

Module “formula editor”

By means of the formula editor, the measured values of 2 sensors can be added or subtracted from each other.

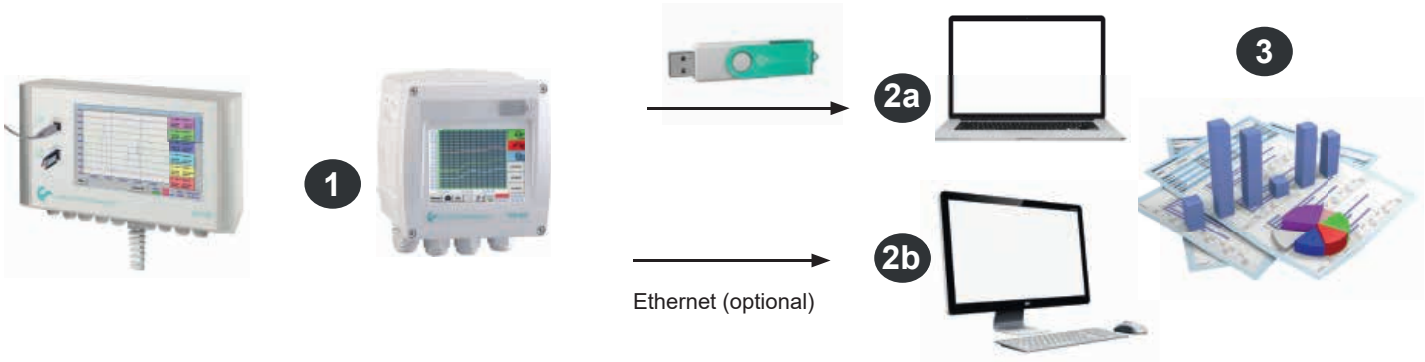
CS Basic

Data evaluation during mobile measurement:



1. Mobile measurement at the customer. Measured data are saved in the data logger in the selected measuring cycle
2. Export of the data to USB stick
3a. Import of the measured data to the laptop directly on-site
3b. Import of the measured data to the computer in the office
4. Evaluation and print out of the measured data

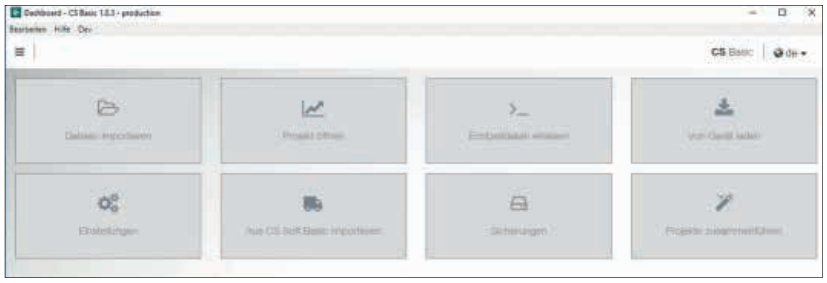
Data evaluation for firmly installed chart recorders in the company:



1. Chart recorder is firmly installed in the company. Measured data are saved in the data logger in the set measuring cycle.
2a. Transfer of the data via USB stick to the computer
2b. Readout of the logger data via the computer network (LAN) by means of CS Basic
3. Evaluation and print out of the measured data

DESCRIPTION	ORDER NO.
CS Basic – data evaluation graphically and in tabular form - reading of the measured data via USB or Ethernet, license for 2 workstations	0554 8040
Additional license for 1 further workplace	Z554 8040
Module “Formula Editor” – by means of the formula editor, the measured values and constants can be calculated with one another (addition, subtraction, division, multiplication, root function, exponentiation)	Z554 8010
Upgrade CS Soft Basic (0554 7040) to CS Basic (0554 8040). CAA module is no longer available. Please state old licence key when ordering	Z554 8041

CS Basic



Intuitive operation

- All important functions can be retrieved via the dashboard.
- Global settings: Adjust units and change decimal places, store company name and logo
- Import real-time data: Establish Ethernet connection to CS logger or sensor. Trace real-time measured values in graphic and in table form
- Import from CS Soft Basic: Data migration from the previous version of CS Soft Basic
- Data backup: Backup of the projects and the database

Graphic evaluation

All measurement curves are indicated in colour. All necessary functions like free zoom, selection/deselection of single measurement curves, free selection of periods, scaling of the axes, selection of colours and so on are integrated:
This view can be saved as a PDF file and sent as an e-mail. Different data can be combined in a shared file.

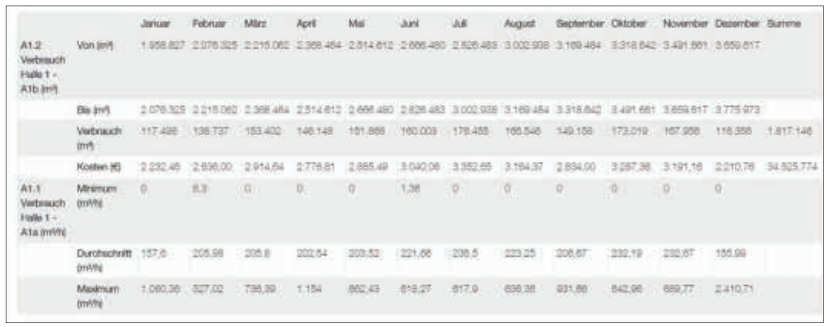
		A2.1	B3.1	B3.2	B3.3
		Pressure	Dewpoint		
		A2a	DewPoint	Rel.Humid.	Temperatur
Datum	Gerät	bar	°Ctd	%	°C
27.01.17 13:52:18	0	9,6749	-50,6462	0,1534	20,2556
27.01.17 13:52:28	0	9,676	-51,4187	0,1394	20,2517
27.01.17 13:52:38	0	9,6769	-52,0952	0,128	20,2499
27.01.17 13:52:48	0	9,678	-52,791	0,1173	20,2479

Table view

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

Statistics

All required statistic data are visible at a glance. So the user can see very quickly which minimal or maximal measured values occurred when and for how long.

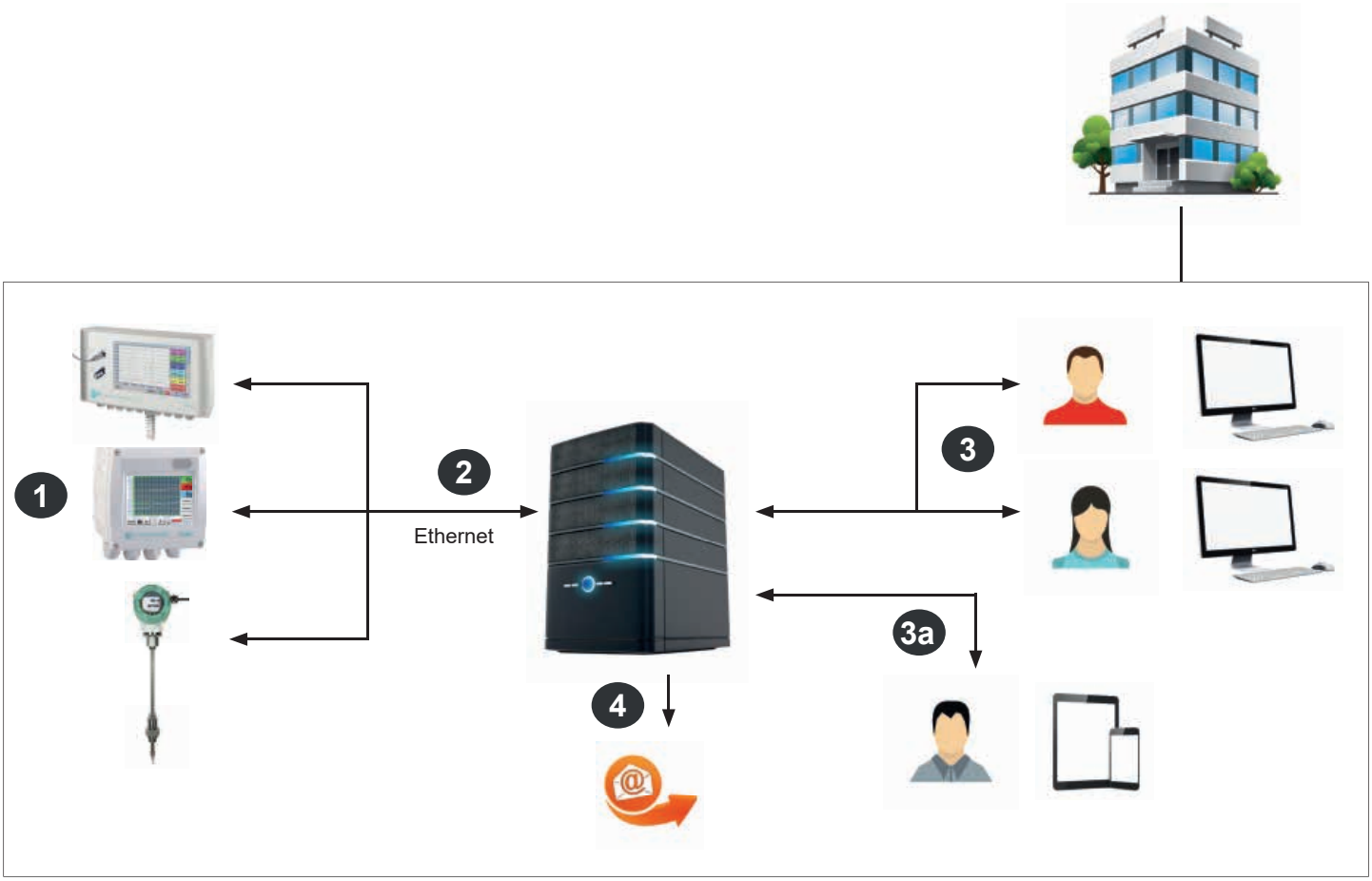


Flow evaluation

The software carries out flow analysis for all connected flow meters, optionally as a daily, weekly or monthly analysis.

CS Network

Energy monitoring for compressed air and gases in an enterprise



1 Single sensors with Ethernet connection or chart recorders with several sensors measure the compressed air and gas consumption of all departments/cost centres in an enterprise.

2 The CS Network (Server Installation) automatically collects the measured values of all CS chart recorders and CS sensors which are connected to the computer network in an enterprise and stores them in a database.

3 The evaluation/analysis of the measured data is carried out via the evaluation software (Client) at an unlimited number of workstations.

3a The evaluation software (Client) is browser-based and provides the user with quick access to the measured data via tablet or smartphone.

4 In case of an exceeding of the limit values (freely adjustable), there will be an automatic alarm via e-mail

CS Network

Energy monitoring for compressed air and gases in an enterprise

Graphic display with zoom function:

- Selection of the measuring channels to be displayed
- Simple zoom in and zoom out
- Up to 8 y-axes
- Quick access to daily/weekly/monthly view

View: Actual measured values

- Load background image
- Place/fix measured values screen
- Red measured values in case of alarm exceedance
- Quick access to measured value history

		January	February		November	December	Sum
A1.2 Flow Hall 1 – A1b (m³)	**From (m³)**	1958827	2076325		3491661	3659617	
	To (m³)	2076325	2215062		3659617	3775973	
	Flow (m³)	117.498	138.737		167.956	116.356	1817146
	Costs (€)	2232.46	2636.00		3191.16	2210.76	34525.774

DESCRIPTION	ORDER NO.
CS Network – energy monitoring with client/server solution (max. 20 measured values of different sensors/devices)	0554 8041
CS Network – energy monitoring with client/server solution (max. 50 measured values of different sensors/devices)	0554 8042
CS Network – energy monitoring with client/server solution (max. 100 measured values of different sensors/devices)	0554 8043
CS Network – energy monitoring with client/server solution (max. 200 measured values of different sensors/devices)	0554 8044
Module “Formula Editor” – by means of the formula editor, the measured values and constants can be calculated with one another (addition, subtraction, division, multiplication, root function, exponentiation)	Z554 8010
Module “Cockpit Function” – By means of the Cockpit Function, you can create your personal background layout for the online values	On request
Module “Automatic Flow Evaluation” is e-mailed to a distribution list at the end of the month	On request
Module “Bar Chart, Pie Chart” for annual comparisons	On request