



Powerful quality at low prices

CS and CSmicro

**Non-contact temperature measurement solutions
for apparatus, machinery and plant engineering**

Innovative Infrared Technology

Dear Users,

We are proud to present to you the optris CS and CSmicro series for **optimum contactless temperature measurement solutions in the fields of apparatus, machinery and plant engineering.**

CS and CSmicro - The new infrared sensors

Surpassing by far the possibilities offered by contact-making measurements with thermocouples, the miniaturised infrared sensors of our CS and CSmicro series are an attractive alternative for **integrating temperature measurement** into ever more compact and complex devices, machinery and equipment.

Not least because of their excellent price performance ratio, easy implementation and numerous accessories, the CS and CSmicro series have opened the door for infrared sensors **to be used in entirely new design concepts.**

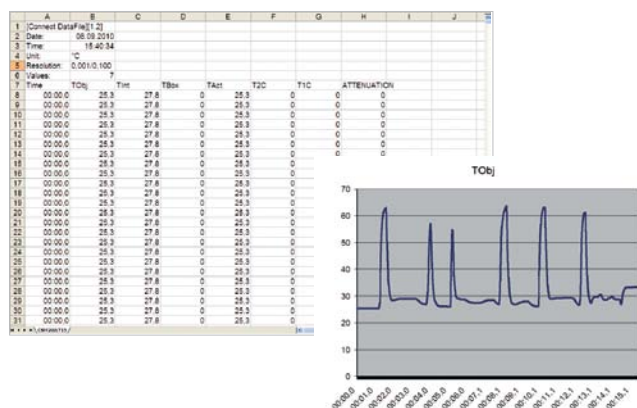
And the technology level achievable within a reasonable cost frame is surprisingly high.

If modern tablet PCs have revolutionized the computer market, the CS and CSmicro series are just as revolutionary, albeit in the very specialized and narrow field of contactless temperature measurement. This is nicely illustrated by the fact that tablets are now **used to program infrared sensors and for graphic presentation of measured temperatures.**

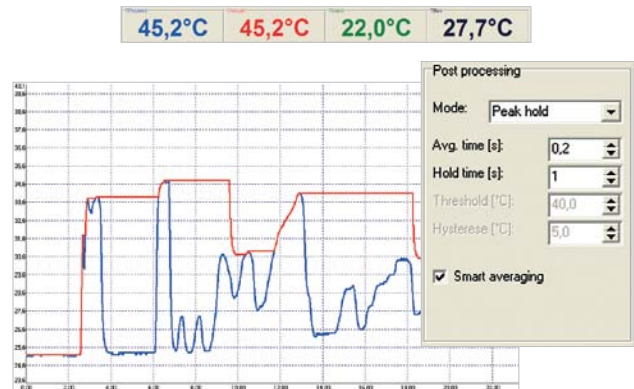
Software is the key

The Compact Connect software offers manifold possibilities for optimum integration of sensors – even multiple sensors in parallel – with the process in hand. It is compatible with Windows operating systems XP, Vista, 7 and 8.

Temperature data can be logged and analyzed, and also exported to MS Excel.



Temperatures are recorded and displayed both in a time-temperature chart and digitally.



Real-time temperature monitoring

Temperature data are displayed in real time and can be processed in parallel. The instruments can display average values and store minimum and maximum values.

State-of-the-art programming

The software is **highly customizable**, offering a large choice of graphical user interface layouts and languages, selection of temperature indication (°C or °F), to name but a few. A special feature is the automatic loading of individual applications and the starting of various software instances to represent multiple sensors.



A **complete parameter set-up** is also supported. Thanks to the use of modern tablet PCs this can be done locally where the sensor is installed. This feature includes, for example, the adjustment of the sensor's measuring parameters (emissivity, offsets, alarm threshold) or the possibility to compensate for the ambient temperature.

Sensor designs

Two design versions are available:



One-piece design

The one-piece design combines **optical unit and electronics package in one single, compact housing.**



Two-piece design

In this version, the **electronics package is integrated into the cable.** This enables us to make the measuring head much smaller but also considerable more rugged. Another benefit is that the heat generated by the two-wire electronics package does not affect the thermal stability of the measuring head.

Sensor models

CS LT



The salient feature of the CS LT sensor are its multiple outputs: 0-10V or 0-5V freely scalable, alarm output, digital output.

CS TC LT



CS TC LT includes an additional type K thermocouple output.

CSmicro LT



CSmicro LT features an extremely small measuring head.

CSmicro 3M



CSmicro 3M is suitable for measuring temperatures as low as 50°C on metal surfaces.

CSmicro 2W LT



CSmicro 2W LT can be deployed in ambient temperatures up to 180°C (sensor head) without cooling.

CSmicro 2W hs LT



CSmicro 2W hs LT offers an excellent thermal resolution of 0.025°C.

CSmicro 2W 2M



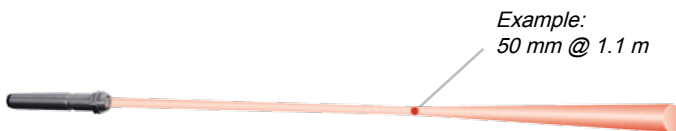
CSmicro 2W 2M covers a wide temperature range between 250°C and 1600°C.

Features

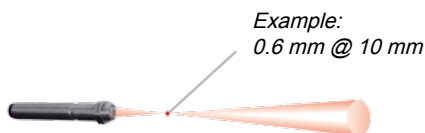
- Excellent price performance ratio
- Temperature ranges from -40°C to 1030°C (CS LT, CSmicro LT, CSmicro 2W), -20°C to 150°C (CSmicro 2W hs LT) and 250°C to 1600°C (CSmicro 2W 2M)
- Multiple outputs: simultaneously analog and digital, 0-10 V, 0-5V or 4-20 mA freely scalable, type K thermocouple
- Alarm/switching output
- Programmable input
- Sensor head dimensions 28 mm and 87 mm with M12x1 thread or 55 mm with M18x1 thread
- Sturdy design in stainless steel housing
- Response time from 10 ms to 150 ms
- LED for alarm indication, sighting aid, self-diagnosis or coded temperature indication
- Optical resolutions from 2:1 to 75:1

Small spot sizes at close and medium distances

The optical units of the CS and CSmicro series are specially designed for close- and medium range measurements. The **standard optical** unit (SF, standard focus) can rapidly be converted into a **close focus** (CF) unit by means of add-on optics.



Standard focus (SF) unit: measures small targets at medium distances



Close focus (CF) unit: measures small targets at close distances

Where ruggedness counts

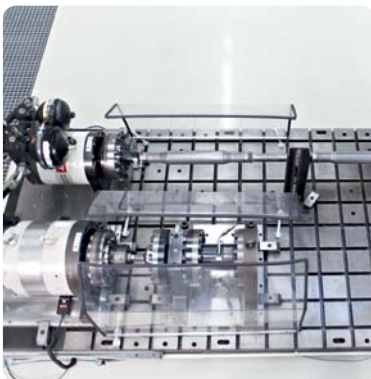
The measuring heads of the CS and CSmicro series are specially designed for deployment to high ambient temperature environments. Various measuring heads offer an extremely high **temperature resistance up to 180°C** and help saving time and money because no additional cooling is required.

If you use the device in severe, dusty conditions the measuring head can be combined with an **air-purge collar** (standard or laminar flow). For short measuring distances the laminar-flow air purge collar is more advantageous as it discharges the air to the sides, which prevents cooling of the target.

Protective enclosures are also available in brass, anodized aluminium or stainless steel. Optionally, a reflection shield can be mounted to the protective enclosure.

Examples of Applications

Measuring moving objects



Recommended: CSmicro 3M

In the metals industry the CSmicro 3M is used to analyse temperature profiles in quality assurance. Customers use it for example at inspection stations for drive shafts.



Recommended: CS LT

In the printing industry, the CS LT is used to monitor temperatures of critical process units in printing processes. Printer manufacturers use it in large printers to accurately determine the temperatures of rollers.

Measuring solid surfaces / plastics



Recommended: CSmicro LT | CSmicro 2W LT

In the medical device industry, CSmicro LT is used to monitor the surface temperature of deep-drawn material in thermoforming processes.



Recommended:
CSmicro LT | CSmicro 2W 2M

Equipment manufacturers use it for temperature measurements on pressure vessels, crucibles, and other objects to monitor decomposition, extraction, drying and incineration processes.



Measuring through glass / transparent plastics

Recommended: CSmicro 3M

Research labs use CSmicro 3M to measure materials in analyzers through glass or plastic tubes.

Presence detection (also with temperature measurement)

Recommended: CSmicro 3M

In the metal-working industry, CSmicro 3M is used to check the correct positions of heated blanks during transfer processes. In this case the presence of copper blanks is checked and the process interrupted as necessary.



Monitoring of heating and/or cooling processes



Recommended: CSmicro 2W 2M

In the metal-working industry, the CSmicro 2W 2M is used to ensure an optimum process temperature for the heating of steel to a pre-defined temperature. In the example shown here, copper blanks are heated in a furnace before pressing.

Products and accessories

Base Model	CS	CSmicro	CSmicro 2W	CSmicro 2W	CSmicro 2W
Type	LT / TC LT	LT02 / LT15 / 3M	LT15 / LT15H / LT22H	hs LT	2M
					
Classification / special features	Single-piece sensor with smart LED display (self diagnostics, aiming support, alarm, temperature code)	Single-piece sensor with electronics in cable and smart LED display (aiming support alarm etc.)	Single-piece two-wire sensor with electronics in cable	Single-piece two-wire sensor with electronics in cable with high thermal sensitivity	Single-piece two-wire sensor with electronics in cable for metal applications
Detector	Thermopile	Thermopile/Ext.InGaAs	Thermopile	Thermopile	InGaAs
Head cable shortening	■	■ (after electronics)	■ (after electronics)	■ (after electronics)	■ (after electronics)
Thread (sensing head)	M12x1	M12x1	M12x1	M18x1	M12x1
Spectral range	8-14 µm	8-14 µm / 2,3 µm	8-14 µm	8-14 µm	1,6 µm
Temperature ranges	-40°C...1030°C	LT02/15: -40°C...1030°C 3ML: 50°C...350°C 3MH: 100°C...600°C	-40°C...1030°C	-20°C...150°C	2ML: 250°C...800°C 2MH: 385°C...1600°C
Temperature resolution	0,1°C	0,1°C	0,1°C	0,025°C [>20°C]	0,1°C
Optical resolution	15:1	2:1 / 15:1 / 3ML: 22:1 3MH: 33:1	15:1 / 15:1 / 22:1	15:1	2ML:40:1 / 2MH:75:1
Option: CF lens	■	■	■	■	■
Smallest spot (CF optics / add. CF lens)	0,8 mm @ 10 mm	2,5 mm @ 23 mm / 0,8 mm @ 10 mm / 3ML: 1,5 mm @ 30 mm 3MH: 1 mm @ 30 mm	0,8 mm @ 10 mm / 0,8 mm @ 10 mm / 0,6 mm @ 10 mm	0,8mm@ 10mm	2ML:2,7 mm @ 110 mm 2MH:1,5 mm @ 110 mm
Smallest spot (SF optics)	7 mm	7 mm	7 mm	7 mm	7 mm
Sighting	LED aiming	LED aiming	LED aiming	LED aiming	LED aiming
Response time (90%)	25 ms	30 ms	30 ms	150 ms	10 ms
Accuracy	±1,5°C oder ±1,5%	±1,5°C oder ±1,5%	±1,5°C oder ±1%	±1°C oder ±1%	±(0,3% T _{Mess} +2°C)
Outputs analog: 0-20 mA / 4-20 mA / 0-5 V / 0-10 V / t/c (K/J)	- / - / ■ / ■ / ■	- / - / ■ / ■ / -	- / ■ / - / - / -	- / ■ / - / - / -	- / ■ / - / - / -
T _{Amb} Head min.	-20°C	-20°C	-20°C	-20°C	-20°C
T _{Amb} Head max.	80°C	120°C / 85°C	120°C / 180°C / 180°C	75°C	125°C
T _{Amb} Electronics max.	80°C	80°C	75°C	75°C	75°C
Functional inputs / number	■	■	■	■	■
External emissivity adjustment	■ / (via Vcc adjust)	■ / (via Vcc adjust)	-	-	-
External background temperature control	■	■	-	-	-
Trigger input for reset or hold functions	■	■	■	■	■
Digital I/O pins	-	-	■	■	■
Simultaneous analog and digital output	-	-	■	■	■
Alarm output alternatively to analog output	■	■	■	■	■
Additional alarm output	■	■	■	■	■
Power supply	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC
Current draw	4 mA	9 mA	4-20 mA	4-20 mA	4-20 mA
Standard cable length	1 m	1 m	1 m	4 m	1 m
Cable length options	3 / 8 / 15 m	Options up to 9 m	Options up to 9 m	-	Options up to 9 m

Mechanical accessories



Mounting bracket, adjustable in one axis (M12x1-sensing head, massive housing, 2-hole for M12x1)

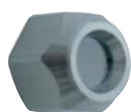


Mounting bolt for M12x1 sensing head, adjustable in one axis



Mounting fork for M12x1 sensing head, adjustable in two axes

Optical accessories



CF ancillary lens or protective window for M12x1 sensing head



CF ancillary lens or protective window, for air purge collar (laminar) or massive housing



Right angle mirror for measurement with 90° to sensor axis



Sighting tube (20 mm) and pipe adapter, for M12x1 sensing head

Air purges and protective housings



Air purge collar, for M12x1 sensing head



Air purge collar, for massive housing



Air purge collar laminar, for M12x1 sensing head



Massive housing, available in brass, anodized aluminium or stainless steel

Examples of possible combination of accessory parts



Air purge collar, laminar

+



Mounting fork

=



Device adjustable in two axes



Massive housing, stainless steel

+



Air purge collar, stainless steel

=



Massive housing with air purge collar



Mounting bracket for M12x1 sensing head

+



Mounting bolt

=



Device adjustable in two axes