optris
infrared sensing

CTvideo 3M

Non-contact temperature measurement
of metals and ceramics from 50 °C to 1800 °C
(122 °F to 3272 °F) with adjustable focus,
patented crosshair laser and video sighting

innovative infrared technology

optris® CTvideo 3M

TECHNICAL DATA

Features:

- Parallel use of video sighting and crosshair laser for easy sensor alignment (measuring spots up from 0.5 mm (0.02 in) under all viewing conditions possible
- Manual focusing for measurement distances from 90 mm (3.5 in)
- Response times up from 1 ms
- Usable in up to 70 °C (158 °F) ambient temperature without cooling and automatic laser switch off at 50 °C (122 °F)
- Short measuring wavelength of 2.3 µm decreases measuring mistakes on surfaces with low or unknown emission rate
- optris Compact Connect software for fast on-site sensor setup, video alignment and real-time process monitoring

Measurement specifications

Temperature range[1] (scalable via software)	50 °C ... 400 °C (122 °F ... 752 °F) (3ML) 100 °C ... 600 °C (212 °F ... 1112 °F) (3MH) 150 °C ... 1000 °C (302 °F ... 1832 °F) (3MH1)[2] 200 °C ... 1500 °C (392 °F ... 2732 °F) (3MH2)[2] 250 °C ... 1800 °C (482 °F ... 3272 °F) (3MH3)[2]
Spectral range	2.3 µm
Optical resolution (90 % energy)	60:1 (3ML) 100:1 (3MH) 300:1 (3MH1-3MH3)
System accuracy[3] (at T_{amb} = 23 ± 5 °C [at T_{amb} = 73 ±41 °F])	± (0.3 % of reading + 2 °C) ± (0.3 % of reading + 36 °F)
Repeatability (at T_{amb} = 23 ± 5 °C [at T_{amb} = 73 ±41 °F])	± (0.1 % of reading + 1 °C) ± (0.1 % of reading + 34 °F)
Temperature resolution (digital)	0.1 K
Exposure time[4] (90 % signal)	1 ms
Emissivity / Gain (adjustable via software)	0.100 – 1.100
Transmissivity / Gain (adjustable via program-ming keys or software)	0.100 – 1.000
Signal processing (parameter adjustable via software)	Peak hold, valley hold, average; extended hold function with threshold and hysteresis
Software (incl.)	optris® Compact Connect (Sensor setup, video sighting and process monitoring)

General specifications

Environmental rating	IP 65 (NEMA-4)
Ambient temperature	–20 °C to 70 °C (50 °C with laser ON) (–4°F to 158 °F (122 °F with laser ON)
Storage temperature	–40 °C to 85 °C (–40 °F to 185 °F)
Relative humidity	10 – 95 %, non-condensing
Vibration	IEC 68-2-6: 3 G, 11 – 200 Hz, any axis
Shock	IEC 68-2-27: 50 G, 11 ms, any axis
Weight	600 g (21.2 oz) (sensing head) 420 g (14.8 oz) (electronics)

Electrical specifications

Output / analog	0/4 – 20 mA, 0-5/10 V, thermocouple J, K
Alarm output	24 V/50 mA (open collector)
Output / digital	USB 2.0 Ethernet (via optional USB server)
Video sighting	Digital (USB 2.0), 640 x 480 px, FOV 3.1° x 2.4°
Output impedances	mA max. 500 Ω (with 8-36 V DC) mV min. 100 kΩ load impedance, thermocouple 20 Ω
Inputs	Programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)
Cable length (sensor + elecronics)	3 m (standard), 5 m, 10 m (9.8 ft [standard], 16.4 ft, 32.8 ft)
Cable length (USB)	5 m, extendable up to 100 m over Ethernet (16.4 ft, expandable up to 328.1 ft over Ethernet)
Current draw (laser)	max. 160 mA
Power supply	8 – 36 V DC
Laser 635 nm	1 mW, ON/OFF via electronic box or software

[1] $T_{Objekt} > T_{sensing\ head}$ + 25 °C
[2] Specification valid at $T_{Object} \geq$ start of measurement range + 50 °C
[3] □ = 1, response time 1 s
[4] With dynamic adaptation at low signal levels
[5] The functionning of the LCD display may be limited in ambient temperatures below 0 °C

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TECHNICAL DATA

Optical parameters

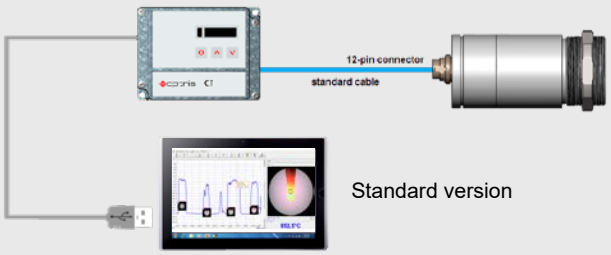
The vario optics of the CTvideo allows a smooth focusing of the optics to the desired distance.

The following tables show examples of measurement distances and the corresponding measurement spot sizes:

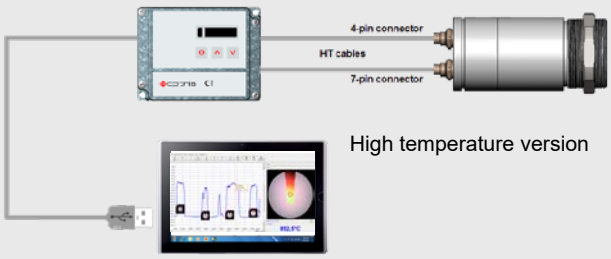
The sensors are available in two versions:
Standard focus (SF): 200 mm (7.9 in) till infinity
Close focus (CF): 90 mm till 250 mm (3.5 in till 9.8 in)

	3ML: SF optics (60:1)								3ML: CF optics (60:1)					
Meas. spot size in mm (in)	3.3 (0.13)	5.0 (0.20)	7.5 (0.30)	11.7 (0.05)	18.3 (0.72)	26.7 (0.04)	41.7 (1.64)	83.3 (3.28)	1.5 (0.06)	2.0 (0.1)	2.5 (0.10)	3.0 (0.1)	3.5 (0.14)	4.2 (0.17)
Meas. distance in mm (in)	200 (7.9)	300 (11.8)	450 (17.7)	700 (27.6)	1100 (43.3)	1600 (63.0)	2500 (98.4)	5000 (196.9)	90 (3.5)	120 (4.7)	150 (5.9)	180 (7.1)	210 (8.3)	250 (9.8)
	3MH: SF optics (100:1)								3MH: CF optics (100:1)					
Meas. spot size in mm (in)	2.0 (0.1)	3.0 (0.1)	4.5 (0.18)	7.0 (0.28)	11.0 (0.43)	16.0 (0.63)	25.0 (0.99)	50.0 (1.97)	0.9 (0.04)	1.2 (0.05)	1.5 (0.06)	1.8 (0.07)	2.1 (0.08)	2.5 (0.10)
Meas. distance in mm (in)	200 (7.9)	300 (11.8)	450 (17.7)	700 (27.6)	1100 (43.3)	1600 (63.0)	2500 (98.4)	5000 (196.9)	90 (3.5)	120 (4.7)	150 (5.9)	180 (7.1)	210 (8.3)	250 (9.8)
	3MH1-3MH3: SF optics (300:1)								3MH1-3MH3: CF optics (300:1)					
	0.7 (0.03)	1.0 (0.04)	1.5 (0.06)	2.3 (0.09)	3.7 (0.15)	5.3 (0.21)	8.3 (0.33)	16.7 (0.66)	0.3 (0.01)	0.4 (0.02)	0.5 (0.02)	0.6 (0.02)	0.7 (0.03)	0.8 (0.03)
	200 (7.9)	300 (11.8)	450 (17.7)	700 (27.6)	1100 (43.3)	1600 (63.0)	2500 (98.4)	5000 (196.9)	90 (3.5)	120 (4.7)	150 (5.9)	180 (7.1)	210 (8.3)	250 (9.8)

Connection modes

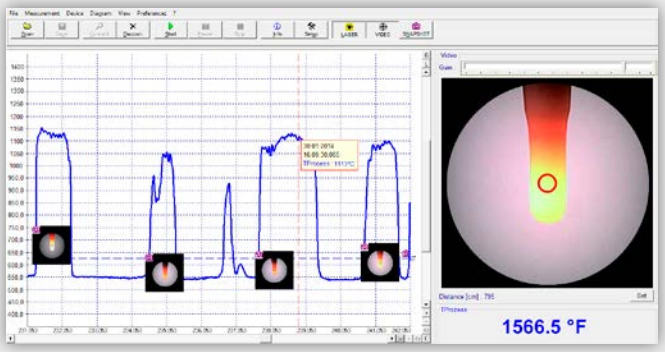


Standard version



High temperature version

Software included



- Automatic snapshots (time- or temperature dependent) to control and document the process
- Graphic display and recording of the measurement values
- Setup of sensor parameters and signal processing functions
- Remote control of the sensor

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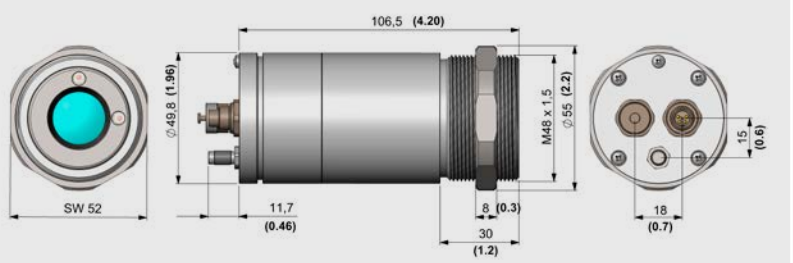
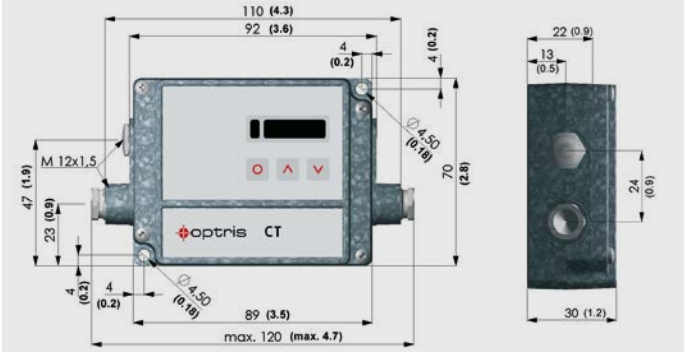
TECHNICAL DATA

Dimensions sensing head





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