optris CTi 4ML
TECHNICAL DATA

High speed pyrometer for temperature measurement from 0 °C to 500 °C (32 °F to 932 °F)

Features:

- Miniaturized Infrared Thermometer with ultra-fast exposure time of 110 µs
- Small-sized head of 14 mm (0.6 in) diameter and 28 mm (1.1 in) length fits everywhere and is usable up to 70 °C (158 °F) without cooling
- The CTi 4ML is ideal for precise temperature measurements in all ultra-fast processes with low object temperatures starting at 0 °C (32 °F)

General specifications	
Environmental rating	IP 65 (NEMA-4)
Operating temperature range	–20 °C [-4 °F] ... 70 °C [158 °F] (sensing head) –20 °C [-4 °F] ... 85 °C [185 °F] (electronics)
Storage temperature	–40 °C [-40 °F] ... 85 °C [185 °F] (sensing head) –40 °C [-40 °F] ... 85 °C [185 °F] (electronics)
Operating air humidity range	10 – 95 %, non-condensing
Vibration (sensor)	IEC 60068-2-6 (sinus shaped) IEC 60068-2-64 (broadband noise)
Shock (sensor)	IEC 60068-2-27 (25 G and 50 G)
Weight	40 g [1.4 oz] (sensing head) 420 g [14.8 oz] (electronics)

Electrical specifications	
Outputs / analog	0/4 – 20 mA, 0 – 5/10 V, thermocouple K, alarm
Outputs / alarm	24 V/ 50 mA (open collector)
Relay outputs (optional)	Relay: 2 x 60 V DC/ 42 V AC_{RMS}; 0.4 A; optically isolated
Digital interfaces	built-in USB-interface, Optional: EtherNet/IP, Profinet, Ethernet TCP/IP / Modbus TCP, Modbus RTU, RS485, RS232 or relay outputs (2 x optically isolated)
Output impedances	mA max. 500 Ω (with 8 – 36 V DC) mV min. 100 kΩ load impedance thermocouple 20 Ω
I/O Pins (3x)	flexible programming as in- or output: external emissivity adjustment, ambient temperature compensation, uncommitted value, trigger (reset of hold functions), alarm output (open collector 24 V/ 50 mA)
Cable length	3 m (9.8 ft) (standard), 8 m (26.25 ft), 15 m (49.21 ft)
Power supply	8 – 30 V DC / 1.2 W

Measurement specifications	
Measuring temperature range	0 °C [32 °F]... 500 °C [932 °F]
Spectral range	2.2 – 6 µm
Optical resolution (90 % energy)	10:1
CF optics (optional)	5.0 mm @ 50 mm
Measurement uncertainty [2), 3), 4), 7)]	±(0.3 % of reading +2 °C [3.6 °F])
Repeatability [3), 4), 5), 6), 7)]	±0.16 °C [0.29 °F]
Temperature coefficient [2), 3), 4)]	±0.05 K/ K or ±0.03 %/ K
NETD (typically) [3), 4), 5), 6), 7)]	70 mK
Exposure time (90 %)	110 µs
Response time (90 %)	320 µs
Emissivity / Gain (adjustable via programming keys or software / App)	0.05…1.100
Transmissivity / Gain (adjustable via programming keys or software / App)	0.05…1.100
Signal processing (parameter adjustable via programming keys or software / App)	Peak hold, valley hold, peak picker, average; extended hold function with threshold and hysteresis
Software / App	optris CompactPlus Connect / IRmobile App

[1)] The LCD display capacity may be limited at ambient temperatures below 0 °C (32 °F)
[2)] Whichever is greater
[3)] Response time = 200 ms (90%)
[4)] ε = 1.000
[5)] Tobj = Tmin + 50 °C (122 °F)
[6)] Response time = 1 ms (90%)
[7)] at ambient temperature (23 ± 5) °C [73.4 °F ± 9 °F]

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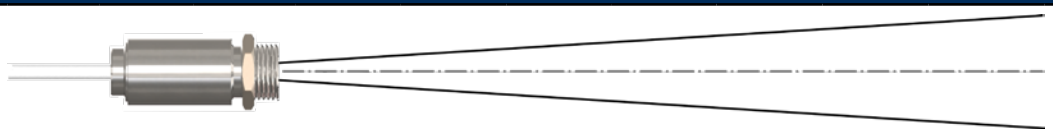
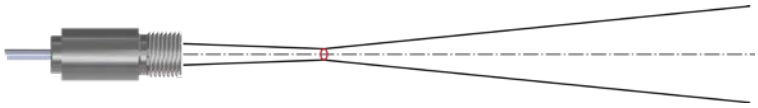
TECHNICAL DATA

Optical specifications - Standard Focus (SF)



Device	D:S	Optical values											
		0	100(3.94)	200(7.87)	300(11.81)	400(15.75)	500(19.69)	600(23.62)	700(27.56)	800(31.49)	900(35.43)	1000(39.37)	Distance in mm (in)
4M	10:1	6.5(0.26)	14.9(0.59)	23.3(0.92)	31.6(1.24)	40(1.57)	51.6(2.03)	63.3(2.49)	74.9(2.95)	86.5(3.41)	98.1(3.87)	109.8(4.32)	Spotsize in mm (in)

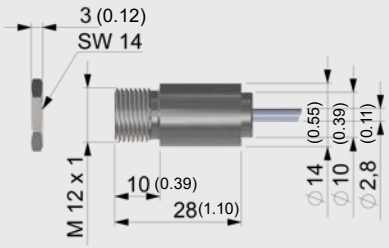
Optical specifications - Close Focus (CF)



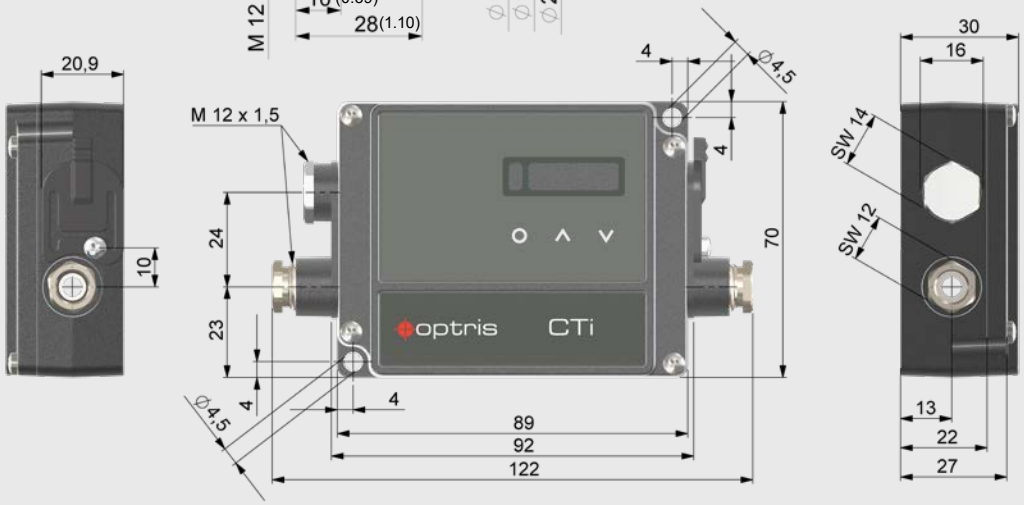
Device	D:S	Optical values											
		0	25(0.98)	40(1.57)	50(1.97)	60(2.36)	75(2.95)	100(3.94)	125(4.92)	150(5.91)	175(6.89)	200(7.87)	Distance (mm)
4M CF	10:1	6.5(0.26)	5.8(0.23)	5.3(0.21)	5.0(0.19)	7.3(0.29)	10.8(0.46)	16.5(0.65)	22.3(0.88)	28(1.1)	33.8(1.33)	39.5(1.55)	Spotsize (mm)

Dimensions in mm (in)

Sensing head



Electronics



Software / App

The CTi 4ML can be directly connected to a PC or smartphone.

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