optris **CTi 4ML**
TECHNICAL DATA

optris infrared measurements

High-speed pyrometer for temperature measurement from 0 °C to 500 °C

Features:

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

General specifications	
Environmental rating	IP 65 (NEMA-4)
Operating temperature range	–20 °C ... 70 °C (sensing head) –20 °C ... 85 °C (electronics)
Storage temperature	–40 °C ... 85 °C (sensing head) –40 °C ... 85 °C (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 (sensing head) 420 g (electronics)

Electrical specifications	
Outputs / analog (2x)	0/4 – 20 mA, 0 – 5/10 V, thermocouple K, alarm
Output / 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, 8 m, 15 m
Power supply	8 – 30 V DC / 1.2 W

Measurement specifications	
Measuring temperature range	0 °C ... 500 °C
Spectral range	2.2 ... 6.0 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)
Repeatability [3), 4), 5), 6)]	± 0.16 K
Temperature coefficient [2), 3), 4)]	± 0,05 K/K or ± 0,03 %/K
NETD (typically) [3), 4), 5), 6)]	70 mK
Exposure time	110 µs
Response time	320 µs
Emissivity / Gain (adjustable via programming keys or software)	0.05…1.100
Transmissivity / Gain (adjustable via programming keys or software)	0.05…1.100
Signal processing (parameter adjustable via programming keys or software, respectively)	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
[2)] Whichever is greater
[3)] Response time = 200 ms (90%)
[4)] ε = 1.000
[5)] Tobj = Tmin + 50 °C
[6)] Response time = 1 ms (90%)
[7)] at ambient temperature (23 ± 5) °C

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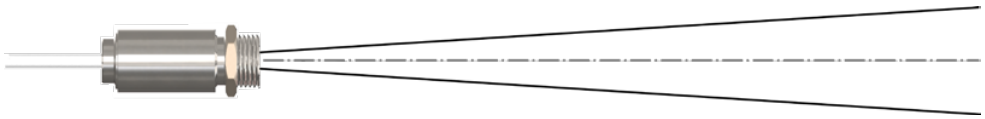
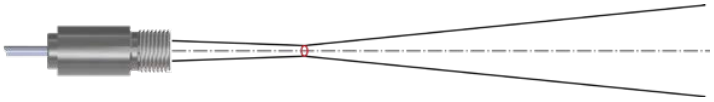
Optical specifications - Standard Focus (SF)



Device	D:S	Optical values											
		0	100	200	300	400	500	600	700	800	900	1000	Distance (mm)
4M	10:1	6.5	14.9	23.3	31.6	40	51.6	63.3	74.9	86.5	98.1	10.9.8	Spotsize (mm)

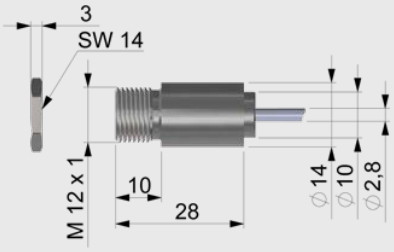
Optical specifications - Close Focus (CF)



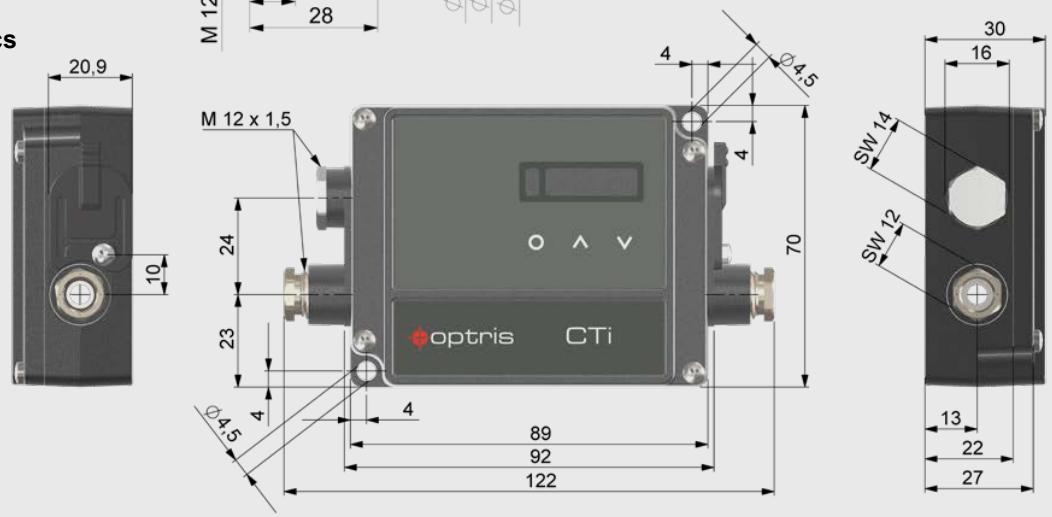
Device	D:S	Optical values											
		0	25	40	50	60	75	100	125	150	175	200	Distance (mm)
4M CF	10:1	6.5	5.8	5.3	5.0	7.3	10.8	16.5	22.3	28.0	33.8	39.5	Spotsize (mm)

Dimensions (in mm)

Sensing head



Electronics



Software / App

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

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