

**Precise non-contact  
temperature measurement  
of metal from 350 °C to 2200 °C**



**Features:**

- Miniaturized Infrared Thermometer with 1.0 µm wave length range for measurements of metals, of secondary metal processing, metal oxides and ceramic materials
- Very small sensing head of 14 mm diameter and 28 mm length fits everywhere and is usable up to 125 °C ambient temperature without cooling
- Temperature ranges from 350 °C to 2200 °C, measuring spots up from 1.5 mm and exposure times up from 110 µs
- Short measuring wave length of 1.0 µm reduces error of temperature readings on surfaces with low or unknown emissivity

**General Specifications**

Environmental rating	IP 65 (NEMA-4)
Operating temperature range <sup>1)</sup>	-20 °C ... 125 °C (sensing head) -20 °C ... 85 °C (electronics)
Storage temperature	-40 °C ... 125 °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 (25G and 50G)
Weight	40 g (sensing head) / 420 g (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 <sub>RMS</sub> ; 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 (standard), 8 m, 15 m
Power supply	8–36 V DC / 1.2 W

**Measurement Specifications**

Temperature ranges (scalable via programming keys or software / App)	350 °C ... 800 °C (1MXL) 485 °C ... 1150 °C (1ML) 650 °C ... 1850 °C (1MH) 800 °C ... 2200 °C (1MH1)
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Spectral range	1.0 µm
Optical resolution (90 % energy)	15:1 (1MXL) 40:1 (1ML) 75:1 (1MH / 1MH1)
Measurement uncertainty <sup>3), 4), 7)</sup>	± 2.0 °C (1MXL) ± (0.3% of reading +1.5 °C) (1ML / 1MH) ± (0.3% of reading +2 °C) (1MH1)
Repeatability <sup>4), 5), 6), 7)</sup>	± 1.4 K (1MXL) ± 1.0 K (1ML) ± 0.5 K (1MH / 1MH1)
Temperature coefficient <sup>3), 4)</sup>	± 0.1 K/K (1MXL / 1ML) ± 0.15 K/K (1MH / 1MH1)
NETD (typically) <sup>4), 5), 6), 7)</sup>	typically: 600 mK (1MXL) typically: 330 mK (1ML) typically: 220 mK (1MH) typically: 160 mK (1MH1)
Temperature resolution (display)	0.1 K
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, average; extended hold functions with threshold and hysteresis
Software / App	optris CompactPlus Connect / IRmobile App

<sup>1)</sup> The LCD display capacity may be limited at ambient temperatures below 0 °C

<sup>3)</sup> Response time = 200 ms (90%)

<sup>4)</sup> ε = 1.000

<sup>5)</sup> Tobj = Tmin + 50 °C

<sup>6)</sup> Response time = 1 ms (90%)

<sup>7)</sup> at ambient temperature (23 ± 5) °C

