

**Precise non-contact temperature measurement with precise aiming from 250 °C to 2200 °C (482 °F to 3992 °F)**

**Features:**

- Accurate temperature measurements of metals, secondary metal processing and ceramic materials
- Double laser aiming marks real spot location at any distance
- Optical resolution up to 300:1 with selectable focus
- Temperature ranges from 250 °C to 2200 °C (482 °F to 3992 °F), measuring spots up from 0,45 mm (0.02 in) and response times up from 1 ms
- Usable up to 85 °C (185 °F) ambient temperature without cooling and automatic laser switch off at 50 °C (122 °F)
- Short measuring wavelength of 1.0 µm or 1.6 µm



**General specifications**

Environmental rating	IP 65 (NEMA-4) front mountable at vacuum processes (up to 10 <sup>-3</sup> mbar)
Ambient temperature <sup>1)</sup>	-20 °C ... 85 °C (-4 °F ... 185 °F) (sensing head) (50 °C [122 °F] with laser ON) -20 °C ... 85 °C (-4 °F ... 185 °F) (electronics)
Storage temperature	-40 °C ... 125 °C (-4 °F ... 257 °F) (sensing head) -40 °C ... 85 °C (-40 °F ... 185 °F) (electronics)
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
Output / alarm	24 V / 50 mA (open collector)
Optional	Relay: 2 x 60 V DC / 42 V AC <sub>eff</sub> ; 0.4 A; optically isolated
Output / digital	USB, RS232, RS485, CAN, Profibus DP, Ethernet (optional)
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	3 m (standard), 8 m, 15 m (9.8 ft [standard], 26.2 ft, 49.2 ft)
Current draw (laser)	Max. 100 mA
Power supply	8–36 V DC
Laser 635 nm	1 mW, ON/OFF via electronic box or software

**Measurement specifications**

Temperature range (scalable via programming keys or software)	485 °C ... 1050 °C (905 °F ... 1841 °F) (1ML) 650 °C ... 1800 °C (1202 °F ... 3272 °F) (1MH) 800 °C ... 2200 °C (1472 °F ... 3992 °F) (1MH1) 250 °C ... 800 °C (482 °F ... 1472 °F) (2ML) 385 °C ... 1600 °C (725 °F ... 2912 °F) (2MH) 490 °C ... 2000 °C (914 °F ... 3632 °F) (2MH1)
Spectral range	1.0 µm (1M) / 1.6 µm (2M)
Optical resolution (90 % energy)	150:1 (1ML, 2ML) 300:1 (1MH, 1MH1, 2MH, 2MH1)
System accuracy <sup>2)</sup> (at ambient temp. 23 ±5 °C) (at ambient tem. 73 ±41 °F)	±(0.3 % of reading + 2 °C) (±[0.3 % of reading + 3.6 °F])
Repeatability (at ambient temp. 23 ±5 °C) (at ambient tem. 73 ±41 °F)	±(0.1 % of reading + 1 °C) (±[0.1 % of reading + 1.8 °F])
Temperature resolution	0.1 K (1ML, 2ML) 0.1 K (1MH, 1MH1, 2MH, 2MH1)
Exposure time <sup>3)</sup>	1 ms (90 %)
Emissivity/ Gain (adjustable via sensor or software)	0.100–1.100
IR window correction (adjustable via software)	0.100–1.000
Signal processing (parameter adjustable via software)	Peak hold, valley hold, average; extended hold function with threshold and hysteresis
Software	optris® Compact Connect

<sup>1)</sup> The functioning of the LCD Display may be limited in ambient temperatures below 0 °C

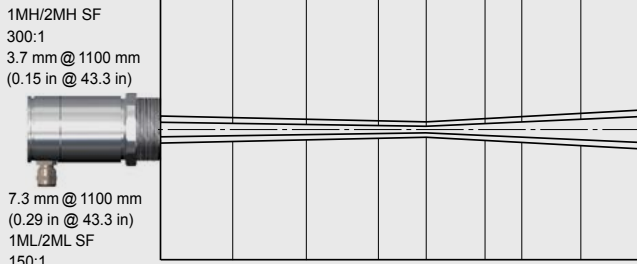
<sup>2)</sup> ε = 1, Exposure time 1 s

<sup>3)</sup> With dynamic adaptation at low signal levels

# optris® CTlaser 1M/2M

## Optical parameter

12	9.8	7.5	5.2	3.7	7.3	9.4	13	16.6
S (0.47)	(0.39)	(0.30)	(0.20)	(0.15)	(0.29)	(0.37)	(0.51)	(0.65) (in)



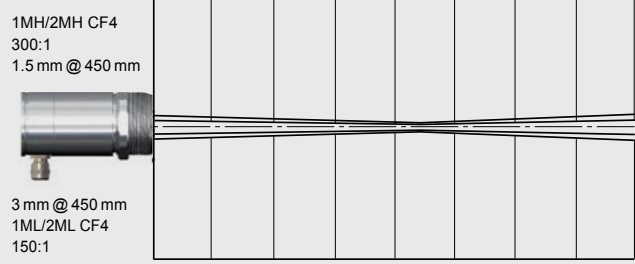
1MH/2MH SF  
300:1  
3.7 mm @ 1100 mm  
(0.15 in @ 43.3 in)

7.3 mm @ 1100 mm  
(0.29 in @ 43.3 in)

1ML/2ML SF  
150:1

20	16.5	13	9.6	7.3	13.5	17.3	23.5	30
S (0.79)	(0.65)	(0.51)	(0.38)	(0.29)	(0.53)	(0.68)	(0.93)	(1.18) (in)
D 0	300	600	900	1100	1350	1500	1750	2000
(0)	(11.8)	(23.6)	(35.4)	(43.4)	(53.1)	(59.0)	(68.9)	(78.7) (in)

12	9.7	7.4	5	2.7	3	6	9	12
S (0.47)	(0.38)	(0.30)	(0.20)	(0.11)	(0.12)	(0.24)	(0.35)	(0.47) (in)



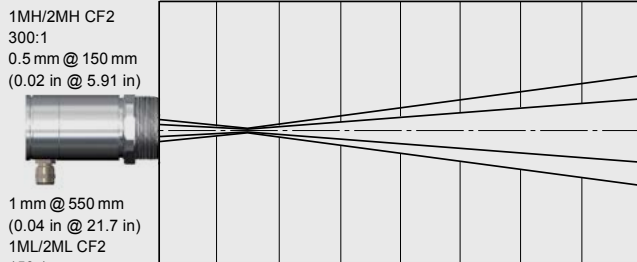
1MH/2MH CF4  
300:1  
1.5 mm @ 450 mm

3 mm @ 450 mm

1ML/2ML CF4  
150:1

20	16.3	12.5	8.7	4.9	5.6	10.7	15.8	21
S (0.79)	(0.64)	(0.49)	(0.34)	(0.19)	(0.22)	(0.42)	(0.62)	(0.83) (in)
D 0	100	200	300	400	500	600	700	800
(0)	(3.94)	(7.87)	(11.8)	(15.7)	(19.7)	(23.6)	(27.6)	(31.5) (in)

12	4.4	4.5	13	21.4	30	38	46.4	54.8
S (0.47)	(0.17)	(0.18)	(0.51)	(0.84)	(1.18)	(1.50)	(1.83)	(2.16) (in)



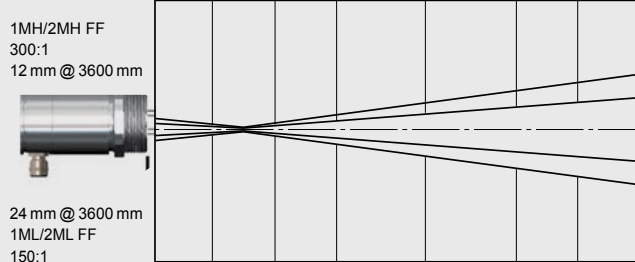
1MH/2MH CF2  
300:1  
0.5 mm @ 150 mm  
(0.02 in @ 5.91 in)

1 mm @ 550 mm  
(0.04 in @ 21.7 in)

1ML/2ML CF2  
150:1

20	7.3	8	22	36	50	64	58	92
S (0.79)	(0.29)	(0.31)	(0.87)	(1.42)	(1.97)	(2.52)	(2.28)	(3.62) (in)
D 0	100	200	300	400	500	600	700	800
(0)	(3.94)	(7.87)	(11.8)	(15.7)	(19.7)	(23.6)	(27.6)	(31.5) (in)

12	12	12	12	12	21.3	28	33
S (0.47)	(0.47)	(0.47)	(0.47)	(0.47)	(0.84)	(1.10)	(1.30) (in)



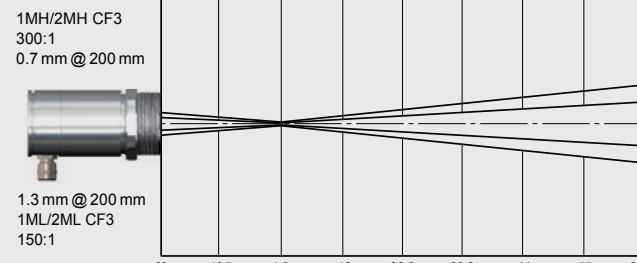
1MH/2MH FF  
300:1  
12 mm @ 3600 mm

24 mm @ 3600 mm

1ML/2ML FF  
150:1

20	21	22	23	24	41	53.4	62.5
S (0.79)	(0.83)	(0.87)	(0.91)	(0.94)	(1.61)	(2.10)	(2.46) (in)
D 0	900	1800	2700	3600	5000	6000	6730
(0)	(35.4)	(70.8)	(106.3)	(141.7)	(196.8)	(236.2)	(264.6) (in)

12	6.4	0.7	7.1	13.4	19.8	26.1	32.5	38.8
S (0.47)	(0.25)	(0.03)	(0.28)	(0.53)	(0.78)	(1.0)	(1.03)	(1.53) (in)



1MH/2MH CF3  
300:1  
0.7 mm @ 200 mm

1.3 mm @ 200 mm

1ML/2ML CF3  
150:1

20	10.7	1.3	12	22.6	33.3	44	55	65
S (0.79)	(0.42)	(0.05)	(0.47)	(0.89)	(1.31)	(1.73)	(2.17)	(2.56) (in)
D 0	100	200	300	400	500	600	700	800
(0)	(3.94)	(7.87)	(11.8)	(15.7)	(19.7)	(23.6)	(27.6)	(31.5) (in)

## Dimensions

### Sensing head



### Electronics

