

CASCADE LASER CORPORATION

Thermal SmartSensors™

Product Information



Figure 1: *Coherent's Thermal SmartSensors*

Some lasers are CW and some are pulsed. They may have large diameter beams or small beams. Some are high power, some are low power, and the wavelength can be from UV to the far IR. No one sensor type can measure all lasers; instead, three types of sensor technology are used based on the sensor material.

Thermal sensors measure the flow of energy through an array of thermoelectric cells. They are rugged and best for measuring medium and high power (CW) lasers. These sensors have an intrinsically flat spectral absorption from the UV to the far infrared, but there are some variations of surface reflection from the sensor, so each sensor is NIST traceably calibrated. Thus, accuracies of $\pm 2\%$ from 190 nm to 10.6 μm can be achieved. Typically, these sensors have a response time of 1-10 seconds, which is decreased to 0.5-2 seconds when matched with a Coherent readout console. See photos below for the Coherent detectors that Cascade Laser distributes.



Part Number	Name	Power Max (W)	Power Min (W) (Note f)	Power Resolution (W)	Aperture (mm)	Notes	Spectral Range (µm)	Accuracy (±%)	For Single Shot Use with Ultima and FieldMaster-GS Max Pulse length (s)	For Single Shot Use with Ultima and FieldMaster-GS Max Joules	For Single Shot Use with Ultima and FieldMaster-GS Min Joules
33-7931	LM-3 HTD Standard Sensors	3	0.01	0.001	19		0.25 - 10.6	2	0.11	10	0.05
33-1132	LM-5000 High Power Sensors	5000	300	1	55	a, e, g	0.25 - 10.6	5	0.34	95	1
33-1124	LM-2500 High Power Sensors	2500	150	1	55	a, e, g	0.25 - 10.6	5	0.34	95	1
33-1116	LM-1000 High Power Sensors	1000	2, 10	0.1, 1.0	38	b, g	0.25 - 10.6	5	0.18	45	0.25
33-1017	LM-80V Volume Absorbers for High Peak Power Lasers	80	0.5, 0.1	0.01	38	h	0.19 - 6.0	4	0.4	45	0.25
33-0993	LM-30V Volume Absorbers for High Peak Power Lasers	30	0.1	0.01	19	h	0.19 - 6.0	3.5	0.17	10	0.07
33-1108	LM-200XLE Excimer Special Absorber Surface	200	1	0.1	55	c	0.19 - 0.35	4	0.24	45	0.5
33-1033	LM-100E Excimer Special Absorber Surface	100	0.5, 0.1	0.01	40		0.19 - 0.35	5	0.34	50	0.25
33-0928	LM-1 High Sensitivity Thermal Sensor	1	0.001	0.0001	9		0.25 - 2.5	5	0.11	1	0.15 mJ
33-1215	Beam Finder Special Purpose Sensors	1000	2	0.1	35	b, d, e	0.3 - 10.6	5	0.6	45	0.25
33-7873	LM-150 FS HTD Standard Sensors	150	0.1	0.01	19	r	0.25 - 10.6	5	0.12	10	0.07
33-7899	LM-100 HTD Standard Sensors	100	0.1	0.01	19		0.25 - 10.6	2	0.12	10	0.07
33-7915	LM-45 HTD Standard Sensors	45	0.1	0.01	19		0.25 - 10.6	2	0.12	10	0.07
33-7923	LM-10 HTD Standard Sensors	10	0.01	0.001	16		0.25 - 10.6	2	0.11	10	0.05
33-7832	LM-200XL HTD Standard Sensors	200	1	0.1	55	c	0.25 - 10.6	4	0.34	95	0.5
33-7857	LM-200 HTD Standard Sensors	200	0.2, 0.1	0.01	19	k	0.25 - 10.6	5	0.12	10	0.07

All SmartSensors are supplied with a 1.8 m (6 ft) cable, stand, and NIST traceable Calibration Certificate.

(a) 7.5 liter/m in cooling water required. Maximum temperature deviation 3% /min. Maximum flow deviation 2% /min.

(b) 4 liter/m in cooling water required. Maximum temperature deviation 3% /min. Maximum flow deviation 2% /min.

(c) 1 liter/m in cooling water required. Maximum temperature deviation 3% /min. Maximum flow deviation 2% /min.

(d) Designed for system integration for measurement of power and position, for use on the Ultima only (supplied with 6 m [20 ft] cable and cooling hoses).

(e) Supplied with 6 m (20 ft) cable.

(f) Value to the left is for Ultima LabMaster and FieldMaster-GS, value to the right is for FieldMaster.

(g) Single shot pulse readings only available on Ultima LabMaster.

(h) Damage limit: Pulse 1GW/cm², measured at 1.06 µm, (10 ns pulse). Varies with wavelength, derate by 50% 0.26-0.35 µm, by 90% below 0.26 µm, Maximum Average Power Density 30W/cm².

(k) Must be used with 110 VAC power for internal fan cooling for powers above 50 Watts.

(p) Designed for system integration, must be mounted to a heat sink.

(q) ± 7% from 0.19 to 0.30 mm.

(r) Intermittent duty (2 min @ 150W; 5 min @ 100W; 20 min @ 40W).

(t) Must be used with 220 VAC power for internal fan cooling for powers above 50 Watts.

(v) 10x Amp available (catalog number 33-0480), please call for details.

(x) Max pulse width is 0.3 ms for FieldMaster.

(y) For use with the Ultima LabMaster and FieldMaster-GS only.

(z) 1 µW for FieldMaster.

(#) No test slide supplied.

Contact Cascade Laser Corporation for ordering information or to request a quotation on any of these products.

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