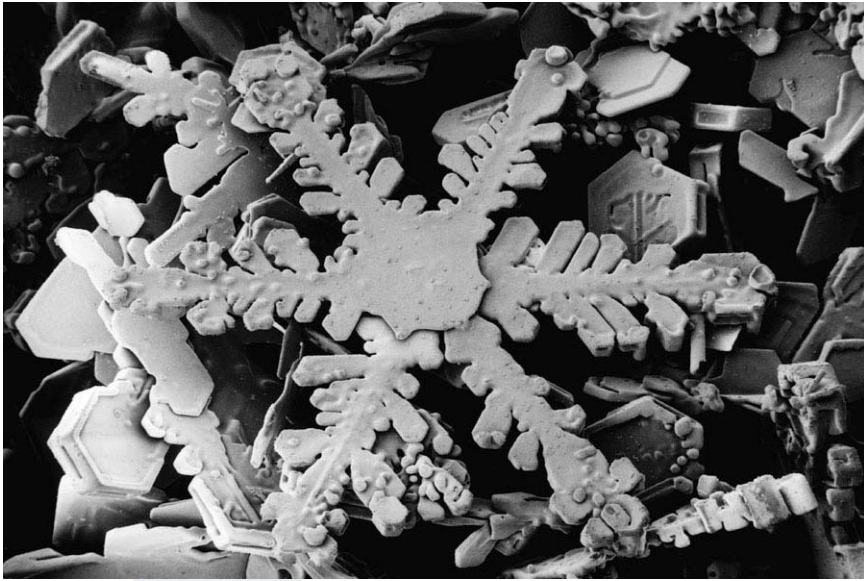


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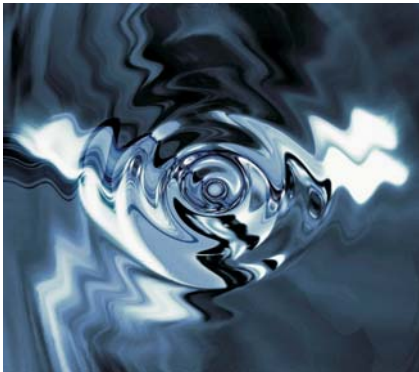
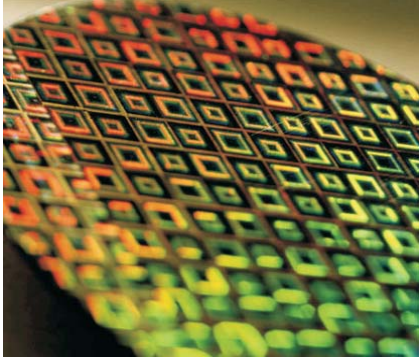


advanced **laser** displacement **system**
compact CCD sensor

MLS1
extended range

INPROX sensors

advanced laser displacement system



industrial grade distance measurements

With a tough IP65 housing the MLS1 series of compact laser CCD displacement measurement systems is engineered to resist difficult production environments where temperature, dirt and other typical contaminants may impede performance.

«with a high degree of shock and vibration resistance

insensitivity to color changes

The MLS1 series employs CCD technology which virtually eliminates light quantity distribution issues (color variation); by measuring the peak value of light quantity distribution off the beam spot detecting individual pixels and identifying this as the critical target position. Thereby, enabling extremely stable and highly accurate displacement measurements; regardless of light distribution.

«digital signal processor with intelligent logic

analog or digital outputs

Advanced resolution measurements are processed digitally within an integrated controller. Then the analog or digital data obtained can easily be transmitted via RS232/USB connections.

«1-9v analog output (4-20mA optional)

multiple control suite

Synchronization, limit systems, averaging and adjustable measurement rates through a user friendly software platform. Integrated Texture-Mapping-Compensation (TMC) allows for variations in surface conditions.

«texture-mapping-compensation

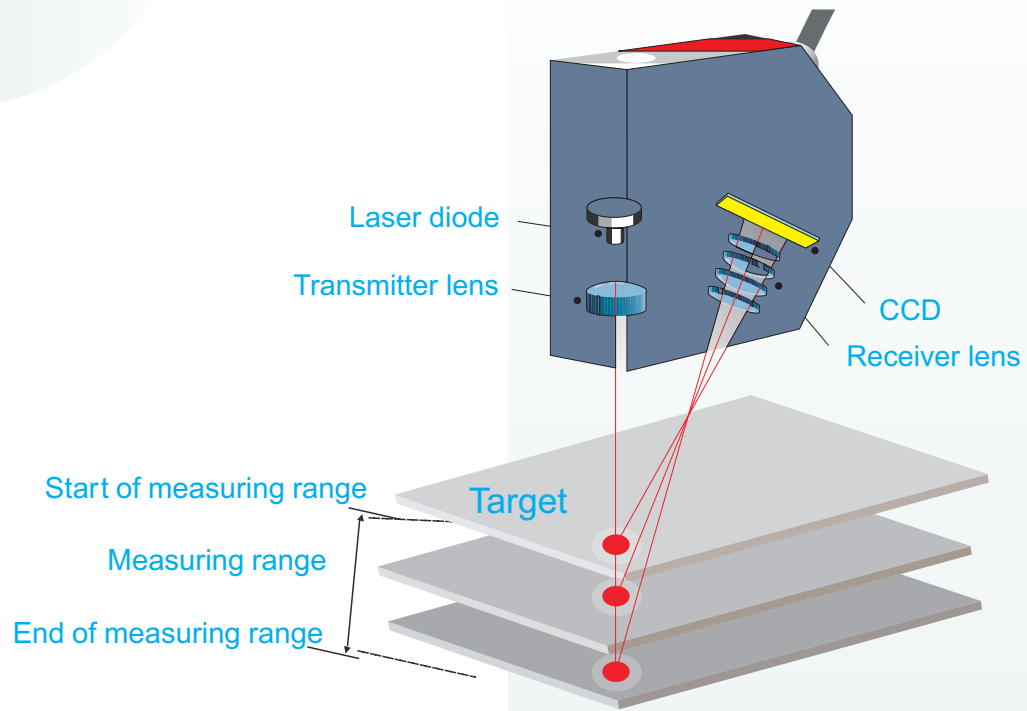
10 models in the series

With max ranges from 30-4000mm; and resolution rates from 0.002 μ m-0.5 μ m the MLS1 series offers flexible options for advanced laser CCD displacement measurements.

«resolution down to 0.002 μ m

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CCD Advantages

- ❏ TMC texture-mapping-compensation for continuity on variable surfaces
- ❏ CCD in a miniaturized housing size
- ❏ ability to synchronize (2) or more sensors for thickness and displacement measurements
- ❏ analog and digital outputs

- ¥ highest resolution in class
- ¥ best repeatability in class
- ¥ best cost/performance ratio
- ¥ highest distance to resolution ratio

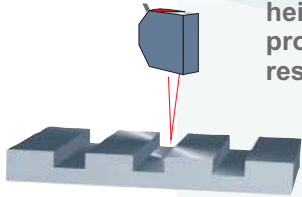


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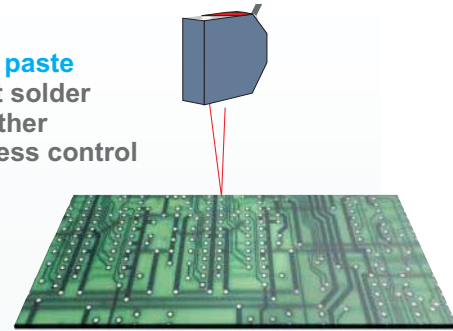
Part variation detection for production

The MLS1 can effectively detect height differences in production parts; with resolution down to 10µm.



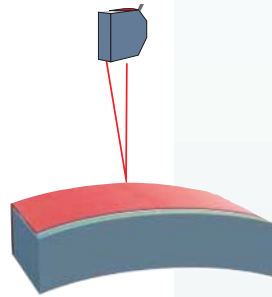
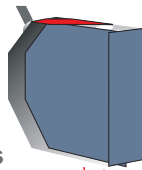
Detecting and measuring solder paste

The MLS1 can effectively detect solder paster in PCB fabrication and other important semi-conductor process control applications.



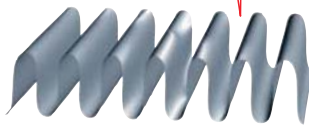
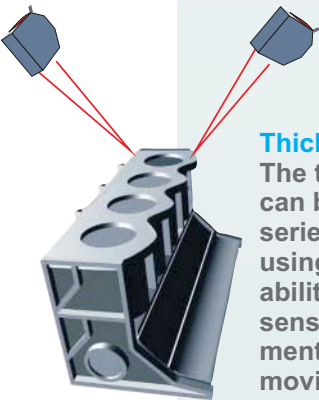
Parts measurements

On difficult metal product surfaces the MLS1 performs beyond the spec's in quality applications. Bending deflection, concentricity, eccentricity and roundness can be accurately measured.



Paper roll thickness measuring

The MLS1 with it's nearly 10' max range is a cost effective tool in critical measurement applications in pulp and paper.



Positioning of critical parts in production lines

The MLS1 is a unique measurement tool for process staging; in order to determine the position of the part relative to the tool or robot (punching, presses, drills and sub-assemblies). Trust the MLS1 system for the highly precise measurement of a glossy surface with the assistance of texture-mapping-compensation technology.

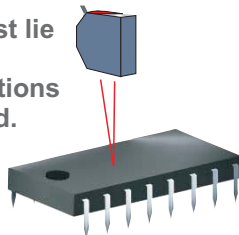


Thickness measurement (synchronous)

The thickness of parts and materials can be determined with the MLS1 series laser displacement system; using high measuring rates and the ability to sequence two or more sensors for simultaneous measurement. This series is the ideal choice for moving and in motion targets.

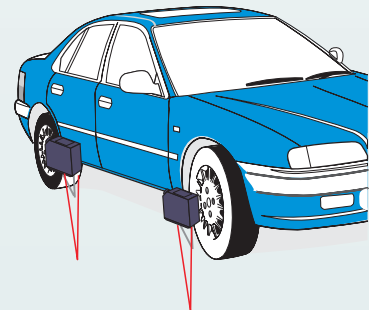
Measurement of pin thickness

During PCB assembly all IC pins must lie in one plane and with the small spot diameter of the MLS1 series; applications such as this can be effectively solved.



Measurement of "car to road" or "train to road"

The MLS1 is particularly well suited in difficult road and track tests involving the measurement of pitch, roll and brake spring compression. The MLS1 CCD laser displacement sensor system's compact design and the option of running the sensor directly off the vehicle's own power supply.



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advanced laser displacement system

Electrical data	Supply voltage	24 VDC +/-10%										
	Power consumption	~ 4.5 W typ.										
	Measuring / testing frequency	0.5 / 1 kHz										
	Analog output	1-9 VDC 4-20 mA										
	Serial output	RS232 (Baudrate: 38400)										
	Cable	7x2x0.14 mm ² , shielded, 2.5 m length										
	Lightsource	Laser, Wave length	typ. 670 nm									
Laser power		< 1 mW										
Laser CLASS		2 (EN 60825-1:1994)										
Data on ambiente conditions	Max. operating temperature	0 to +45 °C										
	Max. storage temperature	-20 to + 70 °C										
	Max. rel.humidity	90% (not condensing)										
	Protection	IP 65										
Specific data		Sensor MLS1										
		30	100	200	300	500	700	900	900/M	1400	2000	
	Sensing range (mm)	from	100	100	100	100	200	400	700	1500	700	2000
		up to	130	200	300	400	700	1100	1600	2400	2100	4000
	Center distance		115	150	200	250	450	750	1150	1950	1400	3000
	Spot Ø	mm	1	1	1-2	1-2	1-2	1-2	4	5	5	5
	Resolution*	mm	0.002	0.01**	0.05	0.25	0.1	0.5	0.1	0.3	0.2	0.5
	Linearity*	+/- mm	0.03	0.1	0.3	0.45	0.5	1.05	0.9	1.0	1.4	1.0
	Reproduceability*	mm	0.01	0.01**	0.05	0.25	0.1	0.5	0.1	0.3	0.2	0.5
	Temp.drift	+/- µm/°C	9	30	60	90	150	210	270	270	420	600
	Dimensions		136 x 146 x 50 mm						230 x 70 x 200 mm			
	Weight		approx. 1.6 kg						approx. 3.6 kg			

* Static measurement on white paper

** Specification for digital output; analog output: 0.05 mm

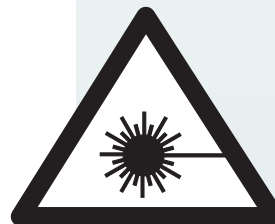
Part No.

030LSM3E / 100L5M3E / 200LSM3E / 300LSM3E / 500LSM3E / 700LSM3E / 900LSM3E / 901LSM3E / 14CLSM3E / 02KLSM3E

INPROX sensors

28 State Street
Suite 1100
Boston, MA 02109
877 INPROX 7
877 467 7697
617 573 5158
617 507 2665 fax
sales@inproxsensors.com

www.inproxsensors.com

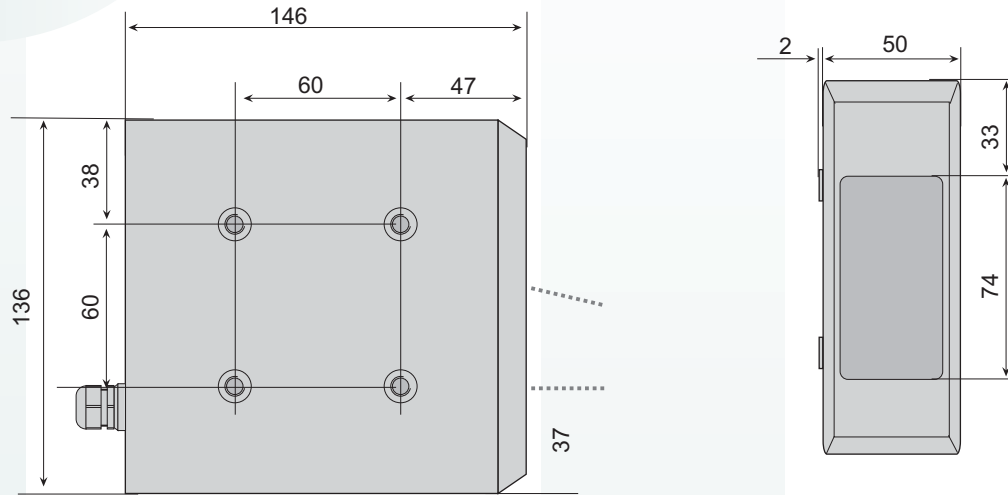


LASER CLASS 2
EN 60825-1:1994

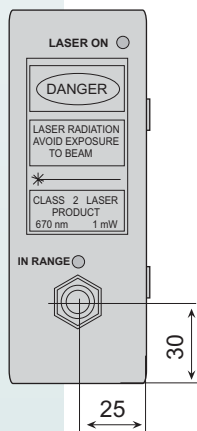
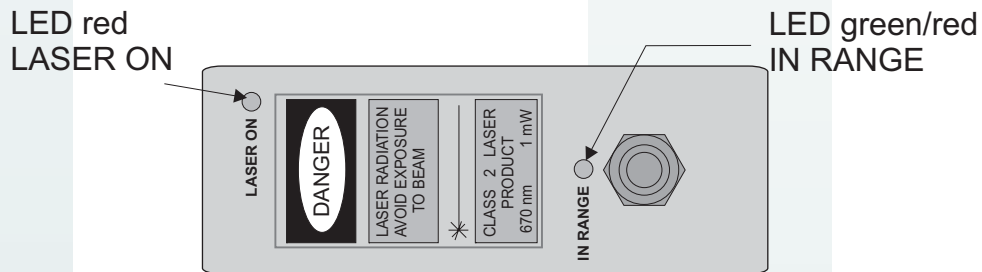
Do not stare into beam!

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advanced laser displacement system



All dimensions in mm



Cable Wiring

red	+24 VDC
blue	GND
green	Laser interlock
violet	Synchr. input
grey/pink	RX digital input
red/blue	RX digital input
yellow	Measure 10 kΩ to GND
white	Analog output 1-9 VDC
brown	Analog output GND
grey	Analog output 4-20 mA
pink	Analog output GND
black	Synchr. output
white/grey	TX digital output (signal)
brown/grey	TX digital output (GND)

