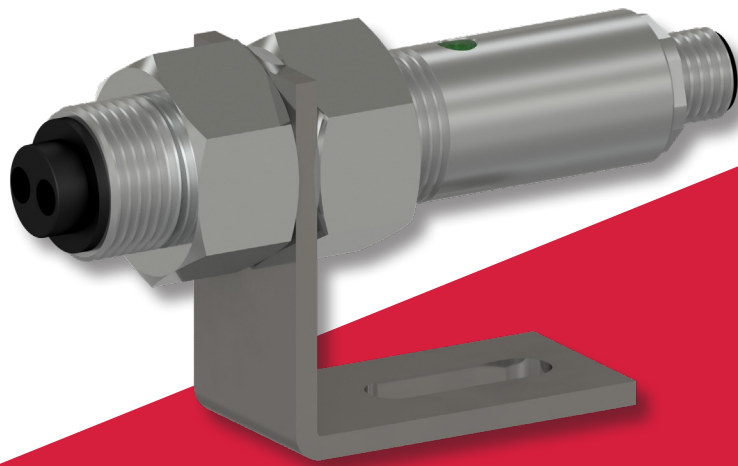




VIBRATION ANALYSIS HARDWARE



LS100

Optical Laser Sensor
Operational Guide





SAFEGUARDS AND PRECAUTIONS



Diode Laser

Max. Output Power: <1 milliwatt

Wavelength: **650 nanometers (visible light)**

Beam Divergence: <18 milliradian

Output: **Continuous (CW)**

Laser Hazard Classification: **Class 2**

Laser Hazards:

Eye injury from beam - Do not look into the direct or reflected beam; can cause eye injury up to 25 ft. [7.5 m] away.

Visual interference (glare) with pilots and drivers - Interferes with vision up to 525 ft. [160 m] away. Can be a distraction up to 1 mile [1.6 km] away. **NEVER point any laser towards aircraft or vehicles; it is unsafe and illegal.**

Safe Use Guidance:

Class 2 lasers are considered safe for accidental eye exposure. Do not look or stare into beam.

Do not aim at aircraft. **This is not a toy.**

Always supervise children.



Read and follow all instructions in this manual carefully, and retain this manual for future reference.

Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.

This instrument is not user serviceable.



In order to comply with EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE): This product may contain material which could be hazardous to human

health and the environment. **DO NOT DISPOSE** of this product as unsorted municipal waste. This product needs to be **RECYCLED** in accordance with local regulations; contact your local authorities for more information. This product may be returnable to your distributor for recycling; contact the distributor for details.



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OVERVIEW

The LS100 Optical Laser Sensor is an optical reflective sensor with a visible red laser light source and green LED on-target indicator. The sensor is rated IP67 and is designed to survive accidental exposure to water, dirt, oil, and other contaminants.

The Class 2 laser source acts as the aiming device during setup and can accurately measure speeds from 1 – 250,000 RPM from a distance of up to 25 ft., with a maximum offset angle of 60° from the rotating object.

The sensor is housed in an M20 x 1.5 threaded 316L stainless steel tube and has a watertight 4 pin M12 on the backend. A 90° mounting bracket and 2 jam nuts are provided for mounting.

The LS100 is designed to mate with CTC's M4T 5 socket M12 connector which can be configured on the CTC cabling of your choice.

The sensor can be powered by 10 – 24 V dc.



CONNECTION DETAILS

Connection to the sensor is via the watertight 4 pin M12 connector on the end of the sensor.



Socket	Color
1 - Supply Voltage (+)	Red
2 - Not Used	Green
3 - Common (-)	Black
4 - Pulse Out (+)	White
5 - Empty	Grey
Case - Shield / Drain	Grey

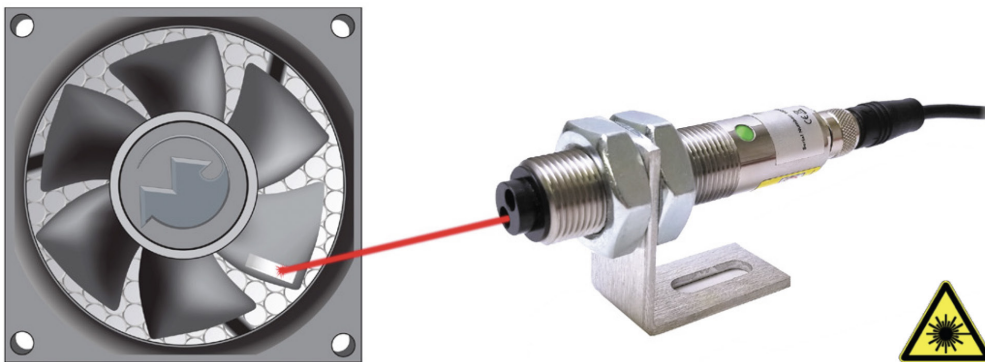
M4T Connector

OPERATING INSTRUCTIONS

Plug the sensor into an appropriate power source (10 – 24 V dc).

The LS100 series is compatible with any modern DAQ that accepts pulse inputs and provides 10–24 VDC sensor power, as long as the DAQ supports sampling rates sufficient for the sensor's RPM range of 1–250,000.

The LS100 Optical Laser Sensor can detect a reflected pulse from a target consisting of T-5 Reflective Tape or high-contrast color differences (such as black and white) at distances up to 25 ft. [7.6 m] from the rotating object and angles up to 60°. For most applications, a ½ in. [12 mm] square piece of T-5 Reflective Tape should be applied to a clean area on the rotating object as a target. At slow speeds, (<500 RPM) best results will be obtained by aiming the laser perpendicular (90°) to the target using a narrow piece of reflective tape – typically 0.2 in. [5 mm] wide.



The LS100 should be optically aligned to illuminate the On-Target Indicator once per revolution. It is recommended that the optical sensor be placed at a slight angle (15°) from perpendicular so that the sensor will receive only pulses from the reflective marker. Triggering from contrasting colors should be done perpendicular to the target. The LS100 should be at least 1 in. from the reflective target to avoid false triggering. The green LED On-Target Indicator will blink at the input frequency rate when the LS100 is properly aimed.

Note: The green LED On-Target Indicator will blink (on/off) at slow speeds and remain on steady at high speeds.

Note: Optical speed sensors require environments that are clean and free of mist, steam, dirt, oil, and other contaminants to function properly. The LS100 can survive these conditions, but it will not function properly if the optics are contaminated. Carefully cleaning or drying the optics will restore normal operation.



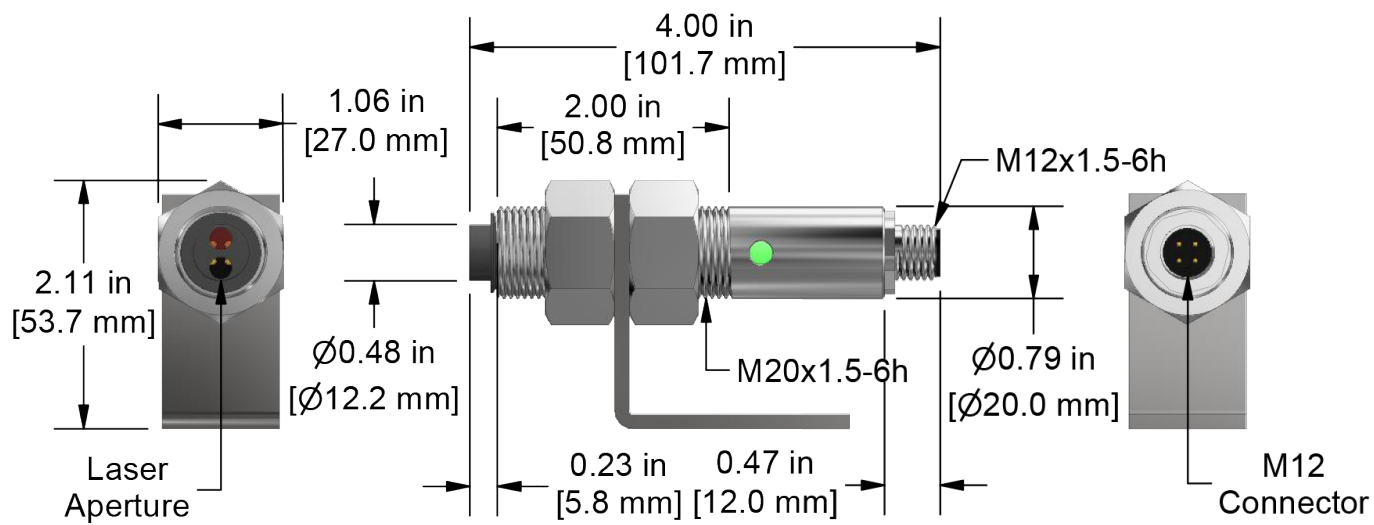
SPECIFICATIONS

Specifications*	LS100 OPTICAL LASER SENSOR	
Speed Range	1 - 250,000 RPM	
Illumination	Visible red laser	
Laser Specifications:		
Classification	Class 2 (per IEC 60825-1:2014) This product complies with IEC60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 of June 2007	
Laser Output	1 mW max	
Laser Operation	Continuous	
Laser Wavelength	650nm (visible red)	
Beam Divergence	<18 mrad	
Beam Diameter	4 x 7 mm typical at 2 m	
Laser Diode Life	8,000 operating hours MTBF	
On-Target Indicator	Green LED on tube body - active when pulse present	
Operating Range	Up to 7.6 m [25 ft.] and 60° offset from target	
Power Requirements	10 - 24 V dc ±20% 0.5W	
Output	Standard: Open Collector with internal pull up resistor (5600 ohm) to supply voltage; positive pulse when target present Note: Output voltage = input voltage - 5V	
Material	Case: 316L stainless steel	Nosepiece: ABS

*Specifications are subject to change without notice



DIMENSIONS



ENVIRONMENTAL

This product is rated IP67 when used with supplied cables.

Operating Temperature: -10 °C to +50 °C (14 °F to 122 °F)

Storage Temperature: -40 °C to +80 °C (-40 °F to 170 °F)

ACCESSORIES

Jam Nut

M20 x 1.5 x 10 mm

Two required to secure to mounting bracket



Mounting Bracket

90° slotted

Reflective Tape

12 in. [25.4 mm]

