L-GAGE® LM Series Laser Sensor

Quick Start Guide

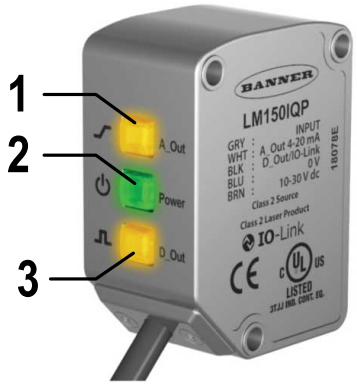
Laser displacement sensor that supports IO-Link communication with analog and discrete (switched) outputs.

This guide is designed to help you set up and install the L-GAGE LM Analog/Discrete Laser Sensor. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at www.bannerengineering.com. Search for p/n 205812 to view the manual. Use of this document assumes familiarity with pertinent industry standards and practices.

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Features and Indicators



Three LED indicators provide ongoing indication of the sensing status.

1. **Analog Output LED Indicator**
   Solid Amber = Displayed distance is within the taught analog output window
   Off = Displayed distance is outside the taught analog output window
2. **Power LED Indicator**
   Solid Green = Normal operation, power On and laser On
   Flashing Green (1 Hz) = Power On and laser Off (laser enable mode)
3. **Discrete Output LED Indicator**
   Solid Amber = Discrete Output is On
   Off = Discrete Output is Off

Laser Description and Safety Information

CAUTION:

- **Return defective units to the manufacturer.**
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Do not attempt to disassemble this sensor for repair. A defective unit must be returned to the manufacturer.

Class 2 Laser Models (LM150 Models)

CAUTION:

- **Never stare directly into the sensor lens.**
- Laser light can damage your eyes.
- Avoid placing any mirror-like object in the beam. Never use a mirror as a retroreflective target.

For Safe Laser Use - Class 2 Lasers

- Do not stare at the laser.
- Do not point the laser at a person's eye.
- Mount open laser beam paths either above or below eye level, where practical.
- Terminate the beam emitted by the laser product at the end of its useful path.

Reference IEC 60825-1:2007, Section 8.2.

Class 2 Lasers

Class 2 lasers are lasers that emit visible radiation in the wavelength range from 400 nm to 700 nm, where eye protection is normally afforded by aversion responses, including the blink reflex. This reaction may be expected to provide adequate protection under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Class 2 Laser Safety Notes

Low-power lasers are, by definition, incapable of causing eye injury within the duration of a blink (aversion response) of 0.25 seconds. They also must emit only visible wavelengths (400 to 700 nm). Therefore, an ocular hazard may exist only if individuals overcome their natural aversion to bright light and stare directly into the laser beam.

Figure 1. FDA (CDRH) warning label (Class 2)

Class 1 Laser Models (LM80 Models)

Class 1 lasers are lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Laser wavelength: 655 nm **Output:** < 0.33 mW **Pulse Duration:** 45 µs to 1750 µs

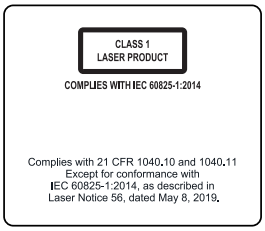


Figure 2. FDA (CDRH) warning label (Class 1)

Installation Instructions

Sensor Installation

Note: Handle the sensor with care during installation and operation. Sensor windows soiled by fingerprints, dust, water, oil, etc. may create stray light that may degrade the peak performance of the sensor. Blow the window clear using filtered, compressed air, then clean as necessary using 70% isopropyl alcohol and cotton swabs or water and a soft cloth.

Install the Safety Label

The safety label must be installed on or near the LM sensors.

Note: Position the label on the cable or near the sensor in a location that has minimal chemical exposure.

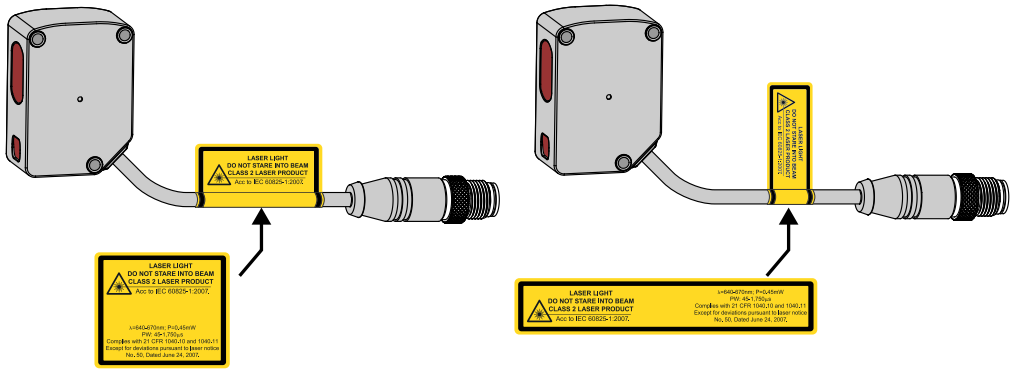


Figure 3. Typical installation; other mounting options are possible.

1. Remove the protective cover from the adhesive on the label.
2. Wrap the label around the LM cable, as shown.
3. Press the two halves of the label together.