

LM Series



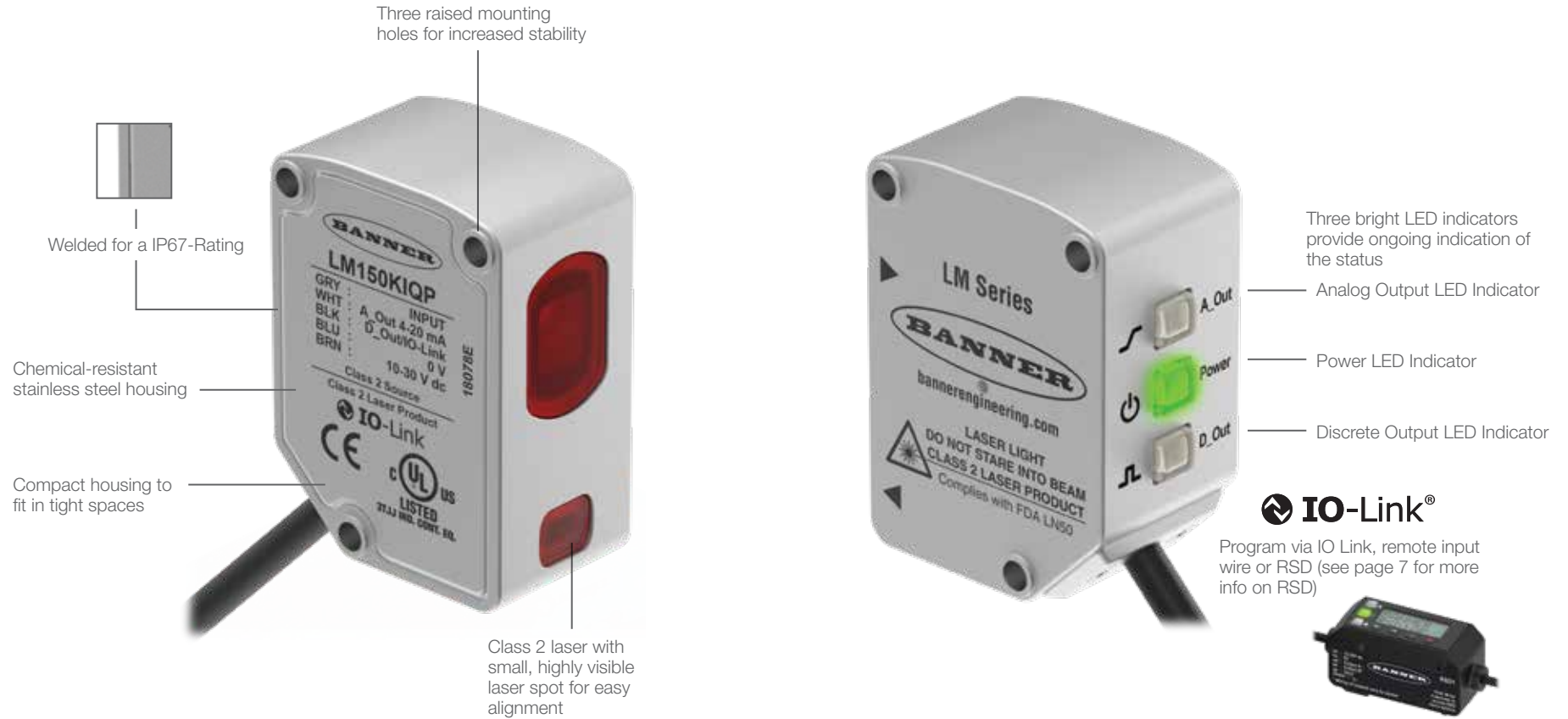
Compact Precision Laser Measurement Sensor

- Superior precision for real world applications
- Best in class thermal & mechanical stability
- Small housing design for the tightest spaces
- High response speed for fast moving targets
- Simplified set up, control and replacement with optional Remote Sensor Display(RSD)



Precise Measurement. Problem Solver

Durable sensor provides reliable measurements even in the most challenging applications



Challenging Targets



Shiny or Metal

Automatic gain adjustment reduces power for high reflectivity targets



Dark Surface

Automatic gain adjustment increases power for low reflectivity targets



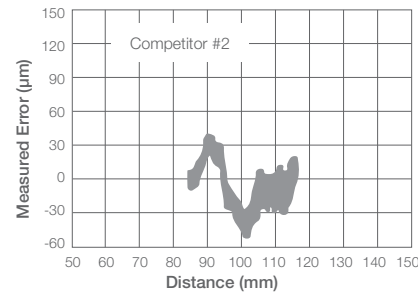
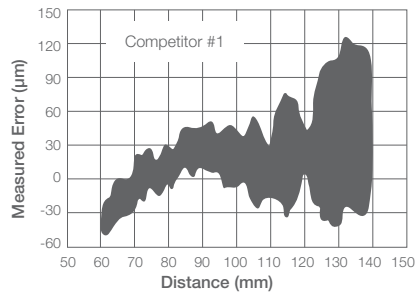
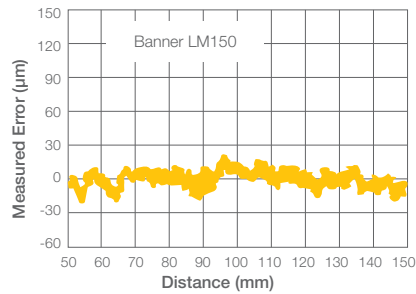
Multicolored

Small beam spot minimizes measurement variation across color transitions

Precision Measurement Regardless of Target or Environment

Linearity

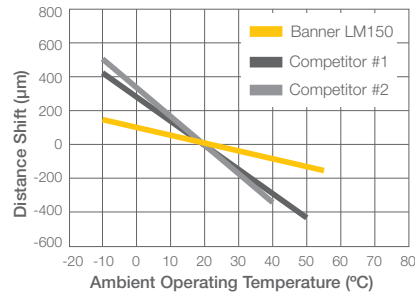
Linearity is the maximum deviation between an ideal straight line measurement and the actual measurement. The more linear a sensor is the more consistent and precise the sensing results.



Example linearity on 90% white card

Temperature Effect

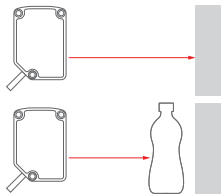
A sensor with minimal temperature effect is critical for precise sensing applications since the induced error from just a few degrees of temperature shift can greatly impact sensors results.



Example temperature effect at max range

Dual mode: Distance and Intensity to Detect Any Change

Clear Object Detection



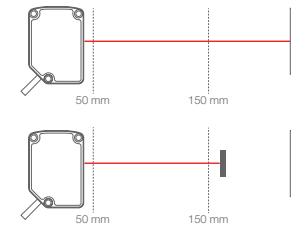
Reliably detects transparent objects without the need of a retro reflector

Contrast



Detects intensity changes due to variation in surface finish, tone, or lightness

Extended Range Presence/Absence



Teach reference to detect changes in contrast, even past the maximum measuring range

Crankshaft Runout Measurement

Crankshaft runout is measured to make sure it is within the manufacturer's tolerance. If the crankshaft is out of tolerance, it can lead to mechanical failures and damage to the engine.

Challenge

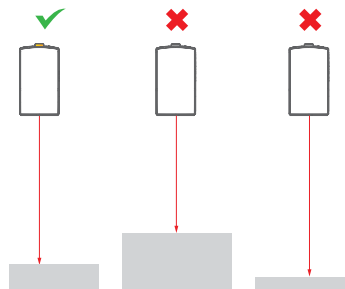
A crankshaft can be a challenging target for any optical sensor, because the shiny metal generates specular reflections while oil residue can present a much darker target. In production environments, crankshafts are often rotated quickly to minimize the time spent on inspection and increase throughput.

Key Features

The LM has been designed with dynamic power adjustment for precision measurement across shiny and dark targets providing less measurement variation and a more reliable inspection. The LM is capable of a 4kHz measurement rate, a best in class measuring speed, for more precise tracking of geometry changes and more robust inspections.

Key Benefits

The accuracy of the LM sensor can assure parts meet tight tolerances with fewer missed defects and false failures. High measurement speeds allow the LM to better identify a problem on fast moving parts while reducing time required for inspections.



Precise measurement regardless of reflectivity of target

Material Thickness

Many times, product quality is verified at the end of the line. Material that is too thin or too thick must be scrapped. When running long rolls of product, it is preferable to continuously monitor the cardboard sheeting thickness, preventing large quantities of product from being out of specification and reduces scrapped material.

Challenge

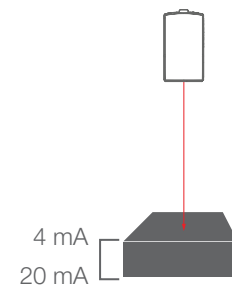
Cardboard material is run in wide sheets and the thickness can vary from side to side and as well as along the entire length. The temperature in the plant can fluctuate several degrees throughout the day, introducing measurement error in most sensors.

Key Features

Three LMs placed across the span of material monitor real-time changes in material thickness. The 0.004 mm resolution can detect very small changes in thickness. The extremely linear output of the LM is imperative when measuring long rolls of product. The LM's stainless steel design makes it more stable across temperature changes in this environment.

Key Benefits

The thermal stability and precision of the LM help detect very small measurement changes in real-time and signal the PLC to speed up or slow down the process, reducing waste.



Extremely linear analog output for precise measurement over a large span of material

Correct Orientation/Alignment

In semiconductor manufacturing, integrated circuit chips are tested one at a time for functionality and performance. The IC chips are placed in a tray, or nest, to be delivered to the test station. The chips must be completely seated and right side up in the nests for presentation to the testing cell otherwise the test process cannot be completed properly.

Challenge

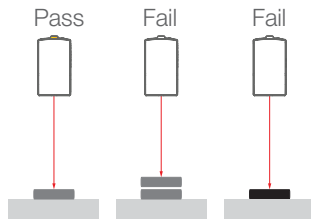
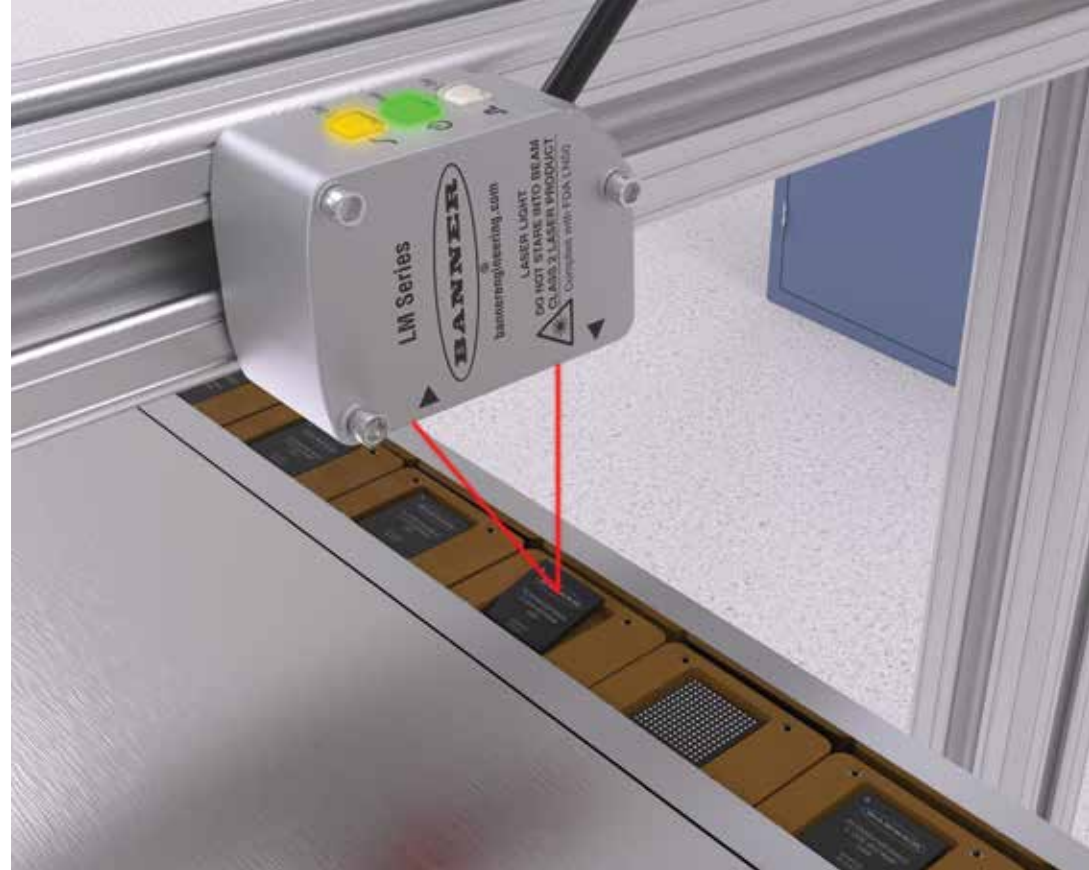
IC chips can be slightly tilted in the nests – which creates a small distance change that is difficult to detect. They can also be seated in the nests, but placed upside down. Test stations have space limitations and do not have room for large vision systems or sensors.

Key Features

Resolution on the LM is able to detect 0.004 mm of height variation, even on black targets. The LM's Dual Teach mode, which measures distance and intensity, makes it able to distinguish contrast differences.

Key Benefits

The LM's precision allows it to catch if the chips are not seated completely in the nest, while the Dual Teach Mode can verify that the chip is right side side up, providing a more reliable inspection and limiting false failures. The compact size of the LM is easy to integrate into the test fixture.

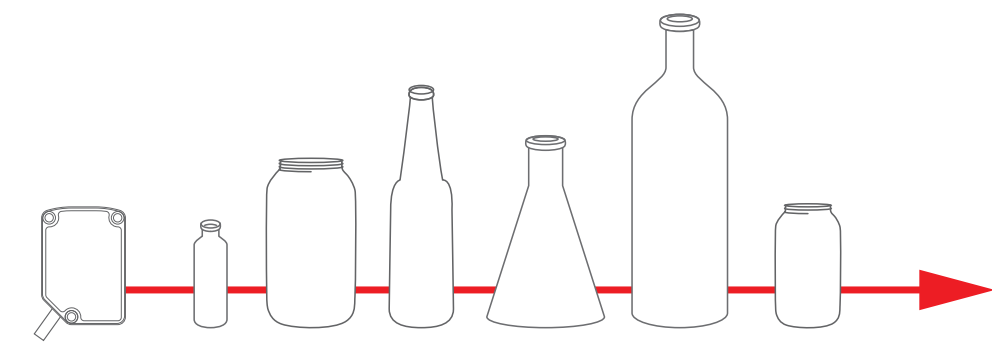
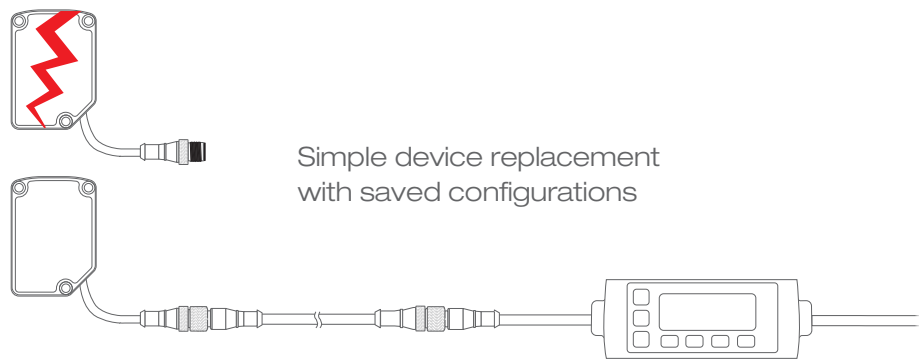


| | | | | |
|----------|---|---|---|---|
| Distance | ✓ | ✗ | ✓ | Inspections use distance to verify parts presence and position, and intensity to verify correct color or part orientation |
| Color | ✓ | ✓ | ✗ | |

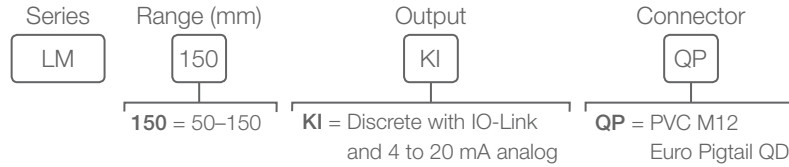
RSD – Remote Sensor Display

The RSD remote display is designed to provide easy sensor configuration and monitoring. It can be used for initial setup by equipment manufacturers with the ability to copy settings across many sensors.




- Allows for configuration of remote sensor heads
- Easy to set up and use with a 2-line, 8-character display
- Display live distance measurement for remote monitoring
- Ability to save up to 6 unique configurations
- Not required for continuous operation of configured sensor(s)



Ability to save up to 6 unique configurations for faster product changeover



| | |
|----------------------|--|
| Resolution | .004 mm |
| Linearity | 50 to 120 mm: ± 0.06 mm 120 to 150 mm: ± 0.07 mm |
| Response Speed | As fast as 0.5 ms depending on base measurement and averaging settings |
| Operating Conditions | -10 to +55 °C (+14 to +131 °F) |
| Environmental Rating | IP67 |

| | |
|--------------------|---|
| Construction | Housing: 316L stainless steel Window: PMMA acrylic |
| Temperature Effect | +/- 0.008 mm/deg C |
| Certifications |    |

Accessories

