LMS Luminescence Sensor

SHIMPO INSTRUMENTS

Operation Manual

Warning

The discrete output must not be connected to outputs from other sensors (i.e. outputs from multiple sensors must not be connected in parallel). Parallel connections may damage sensor output circuitry.

Sensor is not suitable for wash down or hazardous environments; a separate enclosure with the appropriate ratings is recommended for these applications.

IMPORTANT:
This product is an accessory or part of a system. Always read and follow the manufacturer's instructions for the equipment before connecting this product. Comply with all applicable codes and safety regulations. Failure to do so may result in damage, injury or death.

The LMS sensor combines small spot size and fast response to achieve high-speed operation capable of detecting a wide variety of luminescent marks and objects such as wood, adhesives, UV inks and optical brighteners on various surfaces over a range of 50 grayscale levels. The modulated UV light source in the LMS is focused to a 3-5mm spot and directed toward a target. The diffused light returning to the sensor is measured. When the level is equal to or exceeds the threshold the discrete output changes state. Due to the fast response of the sensor, it is suitable for use in high-speed applications. The sensor provides a discrete output that automatically configures to NPN and PNP. A PLC or a computer can be used to monitor the status of the discrete output signal.

LEARNING MODE

Two keys are provided, MARK and BKGD, which are used to set the sensor's detection level. The sensor output will activate when the MARK is detected. The mark may be lighter or darker than the background.

To Set the Sensor:

1. Place the MARK or BKGD in the sensor's light spot and press the appropriate key. Flashing yellow LED indicates proceed with MARK setting, flashing green LED indicates proceed with BKGD setting.

2. Place the other, MARK or BKGD in the sensor's light spot and press the appropriate key. Flashing yellow/green LED indicates insufficient contrast error. Repeat from step 1.

3. Verify that the Yellow led indicates the presence of the mark.

SPECIFICATIONS

UV Light Source: 370 nm LED, min.100,000 hours
Sensing Distance: 28 mm
Spot Size (dia.): 3 to 5 mm
Depth of Field: +/-3 mm from focal point (approx. 28 mm)
Response Time: 25uS
Switching Frequency: 40kHz
LED Intensity: 3 levels
Gray-Scale: 00 to 50
Controls: MARK and BKGD keys
Digital Output: Auto-Detect PNP / NPN
Analog Output: 0 to 5V (20 mV resolution)
Power Indicator: Green LED
Detect Indicator: Yellow LED
Programming Indicator: Yellow/green LED
Data Retention: EEPROM non—volatile memory
Dimensions: 2.0" (51 mm) x 2.4" (61 mm) x 1.0" (25 mm)
Weight: 0.21 lbs. (95 g)
Supply Voltage: 10 to 24 VDC
Operating Current: 60 mA
Short Circuit Protection: Discrete output
Overload/Reverse Polarity Protection: Supply voltage
Operating Temperature: -20°C to 55°C
Storage Temperature: -20°C to 70°C
Housing: Plastic
Mechanical Protection: IP65
Connector: M12, 4-pin

INSTALLATION

Install the sensor using accessory bracket LMS-BRKT or suitable alternative bracket. Position the sensor at approximately 28mm from the target object (measured from the sensor lens surface). Normally the sensor may be positioned on a 15-20° angle to prevent interference from glossy surfaces. When using the sensor to detect the glossy characteristic of the target, position the sensor perpendicular to the target. Connect the cable, LMS-CBL, to power and outputs as required. Do not use other cable without verifying connections and wire colors or damage to the sensor may occur.

CONTROLS

Output LED

During normal operation the yellow LED indicates MARK and the green LED indicates BACKGROUND. Yellow/green LED indicates MARK or BKGD readings are being taken. MARK key Sets mark level. After MARK is measured the LED may flash green indicating that BACKGROUND measurement is required.

BKGD key

Sets background level. After BACKGROUND is measured the LED may flash yellow indicating that MARK measurement is required.

OUTPUT SIGNALS

Discrete Output

The discrete output is a PNP/NPN configuration allowing the user to provide a load on this output that is either pulled high to VDC or low to ground. The sensor monitors this level and automatically determines whether to operate the PNP/NPN driver. This output is typically connected to a PLC. The output remains active as long as the mark is recognized as indicated by the yellow LED on the sensor.

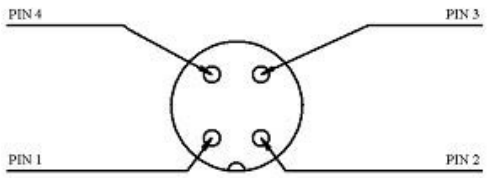
CAUTION: The discrete output must not be connected to outputs from other sensors (i.e. outputs from multiple sensors must not be connected in parallel). Parallel connections may damage sensor output circuitry.

Analog Output

The analog output is 0-5V with 20mV resolution (8-bit). Any standard analog input channel typically available on a PLC may monitor this output. The analog output signal is useful in applications where simply triggering on the threshold is insufficient. For example, constant real-time monitoring of intensity in process allows minor fluctuations or trends to be detected permitting corrective action to be taken. The analog output response time is slower than the discrete output response time and should be evaluated per the requirements of each application.

M12 CONNECTIONS

M12 Connector	Wire Color	Description
Pin 1	Brown	Power 10 to 24 VDC
Pin 2	White	Analog Output
Pin 3	Blue	Ground
Pin 4	Black	Discrete Output, PNP/NPN



DIMENSIONAL DETAILS