# LION
# PRECISION



# USER'S GUIDE
## for the

# LRD3100

## Capacitive Label Sensor

## Description

The LION PRECISION LRD3100 is an electronic, capacitive sensor used to monitor label registration and/or count labels. The outputs indicate the edges of labels as they pass through the sensor.

## Connecting to the Sensor

### Warnings

Sensor body is connected to Ground.

Sensors must not be attached to voltages in excess of 30VRMS or 60VDC.

All external connections must be SELV (Safety Extra Low Voltage).

All power must be off when installing the sensor.

Brown wire must be connected to +V or Ground for reliable operation

Use of the equipment in any other manner may impair the safety and EMI protections of the equipment.

### LRD3100 Wiring

| Wire Color | Connection | Notes |
|---|---|---|
| Red | Vin(11-28V ⎓) | 50mA max. |
| Black | Ground | Connected to sensor body |
| Green | NPN Output | 150mA max. |
| Blue | PNP Output | 150mA max. |
| Brown | Output Polarity (light/dark switching) | +V or Ground See detail on back |
| Warning: Brown wire must be connected to +V or Ground for reliable operation. | | |

Red — +11 to 28VDC

NPN Load

Green — NPN Output 150mA max.

Blue — PNP Output 150mA max.

PNP Load

Black — Ground

Brown — Polarity Invert
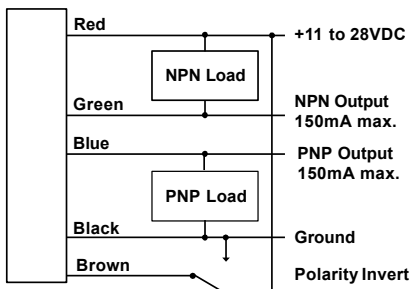
### Specifications

| Power Supply | Voltage | 11-28 V⎓(reverse polarity protected) |
|---|---|---|
| | Current | 50mA |
| Response Time | on or off | 20µs max |
| | Switching Frequency | 10kHz max |
| Output | Output Current (sinking or sourcing) | 150mA max (overload protected) |
| | Switching Output | PNP (sourcing) or NPN (sinking), Dark or light switching |
| Temperature | Operating Range | 40°F to 140°F (4°C to 60°C) |
| Protections | Supply | Inverse Polarity Protection |
| | Switching Output | Short Circuit and Overload Protection |

## Setup Procedure

These sensors are extremely stable and should not require re-adjustment after the initial setup. Re-adjustment will on be required for significant changes in label shape or thickness, or changes in power supply voltage.

1.  Remove all material from sensor.
2.  Center GAIN dial

    Turn GAIN dial to 50
3.  Set ZERO dial

    Set ZERO dial to the point where the ZERO light just begins to come on.

    It is not important whether the light is on or off. What is important is that the light is very near the point where it changes from off to on.
4.  Set GAIN dial

    For most labels, GAIN will need no further adjustment. If the sensor performs erratically, use this GAIN adjustment procedure.

    Insert material into sensor.

    While moving the labels through the sensor, set GAIN dial to the point where the OUT light starts to flash. Then turn dial one additional tick mark.

    **Start of Output* flash plus 1 additional tick mark**
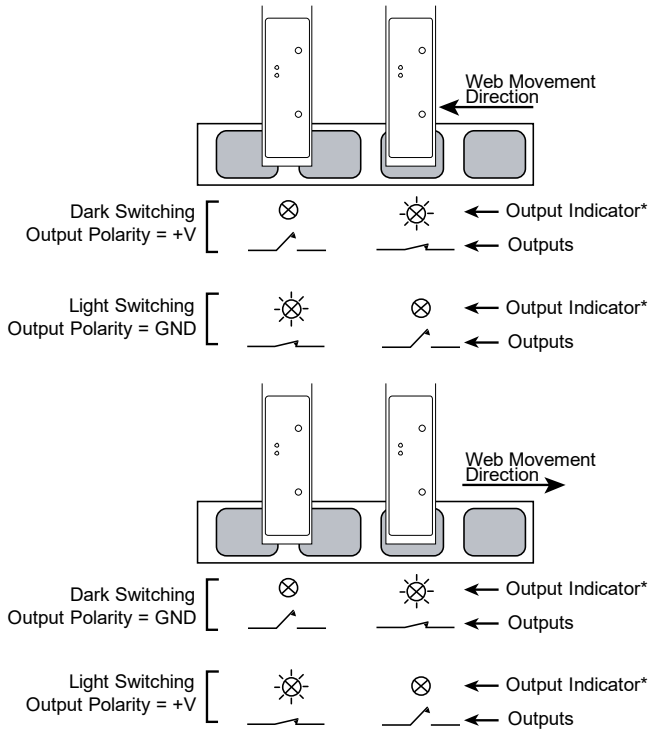5.  Sensor is now ready.
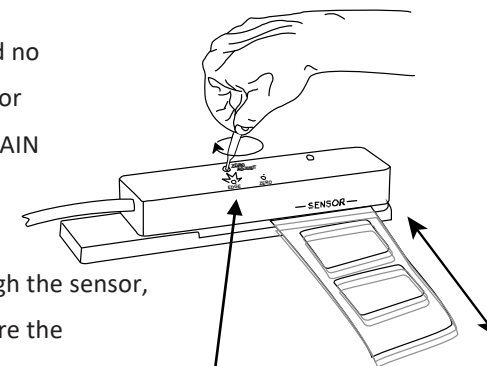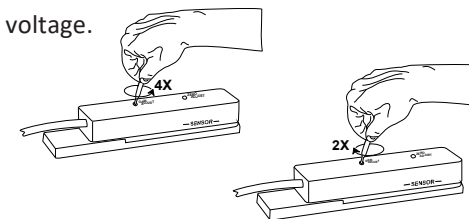
## Lights During Operation

The OUT light indicates the sensor output. It will be in one state (on or off) during the label and the other state during the gap depending on the direction of the label movement and the connection of the Polarity Invert Wire (see next page for details).

The ZERO light is for setup only and is meaningless during operation.

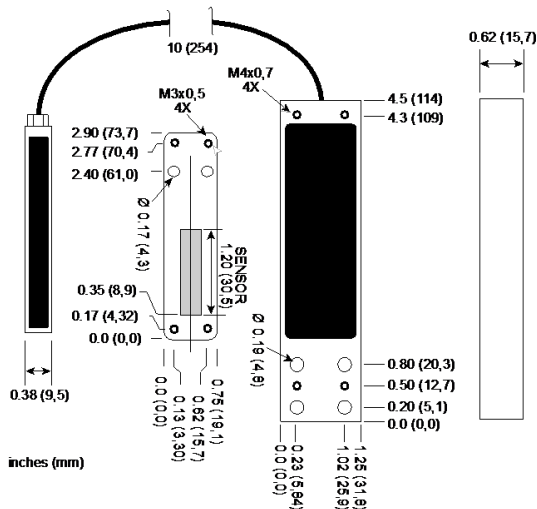## Notes

1.  For best results, web should ride against sensor baseplate, not "float" in the gap.
2.  Some inks, usually black, have high carbon content. These inks behave like metal and may not work reliably with the LRD3100. Use the LRD6300 instead.

Web Movement Direction

Dark Switching
Output Polarity = +V
⊗ → Output Indicator*
→ Outputs

Light Switching
Output Polarity = GND
→ Output Indicator*
⊗
→ Outputs

Web Movement Direction

Dark Switching
Output Polarity = GND
⊗ → Output Indicator*
→ Outputs

Light Switching
Output Polarity = +V
⊗ → Output Indicator*
→ Outputs

*Older models label this indicator as "Edge"

## Mechanical Detail

10 (254)

0.62 (15,7)

M3x0,5
4X

M4x0,7
4X

4.5 (114)
4.3 (109)

2.90 (73,7)
2.77 (70,4)
2.40 (61,0)

Ø 0.17 (4,3)

SENSOR
1.20 (30,5)

0.35 (8,9)
0.17 (4,32)
0.0 (0,0)

Ø 0.19 (4,8)

0.80 (20,3)
0.50 (12,7)
0.20 (5,1)
0.0 (0,0)

0.38 (9,5)

0.75 (19,1)
0.62 (15,7)
0.13 (3,30)
0.0 (0,0)

0.23 (5,84)
0.0 (0,0)
1.25 (31,8)
1.02 (25,9)

inches (mm)

Be confident when you do ***business with Lion Precision.***