

# Installation Instructions

## PHOTOSWITCH® Bulletin 45LFM Label Sensor

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

### Description

The Rockwell Automation 45LFM–CMBA2–D5 Label Sensor is an innovative electronic sensor used to sense and/or count labels. A signal is generated as the edge of the label passes through the sensor. It can be configured to sense the leading or trailing edge.

### Features

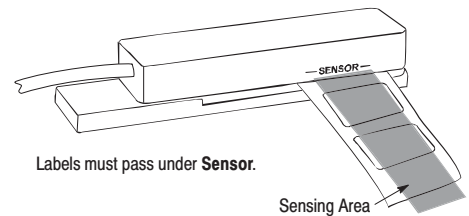
- Consistently senses the presence of most labels on a web
  - Clear labels on clear backing
  - Clear labels on opaque backing
  - Opaque labels on clear backing
  - Metallic labels on opaque backing
  - Metallic labels on clear backing
  - Opaque labels on opaque backing
- Count 50,000 labels per minute with registration error less than 0.01 inch
- Heavy-duty metal housing
- Ideal for label counting and label registering applications
- Immune to color and contrast changes

### Specifications

<b>Supply Voltage &amp; Current</b>	11 to 26V DC @ 50 mA max
<b>Power-Up or Reset Delay</b>	10microseconds
<b>Leakage Current</b>	5µA
<b>Output Configuration</b>	Complimentary: NPN and PNP
<b>Output Rating</b>	150mA max
<b>Short Circuit Protection</b>	Yes
<b>Reverse Polarity Protection</b>	Yes
<b>Impulse Voltage</b>	≤ 500V
<b>Output Invert Control</b>	Yes
<b>Registration Accuracy</b>	0.025mm (0.01in)
<b>Response Time</b>	10microseconds
<b>Maximum Switching Speed</b>	10KHz
<b>Minimum Gap or Label Size</b>	0.76mm (0.03in)
<b>Indicators</b>	Signal strength array
<b>Construction</b>	Anodized aluminum
<b>Environmental Rating</b>	IP54
<b>Connections</b>	5-pin micro QD
<b>Operating Conditions</b>	4°C to 50°C (40°F to 120°F)

### Mounting the Sensor

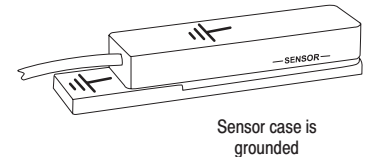
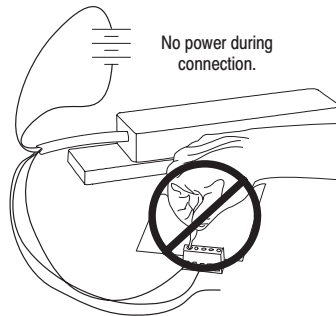
Mount the sensor perpendicular to the web so the web passes through the sensor gap. The back of the web should contact the mounting plate. Labels must pass under sensing area marked [—SENSOR—]. Small labels (38.1mm (1.5in)) must be centered under the sensing area.



### Electrical Connections

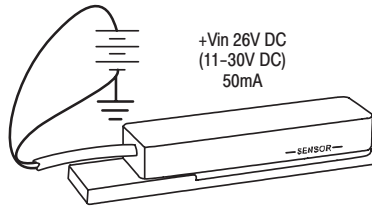


**ATTENTION:** Unused wires must be insulated from contact with other objects. All power must be off when installing the sensor. DC ground is connected to sensor body.



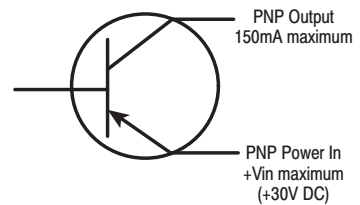
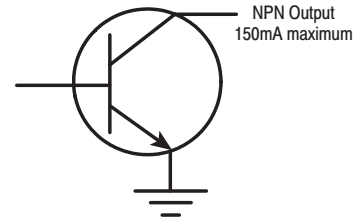
## Power

Sensor can be powered with 11–30V DC but optimum performance is obtained with 24V DC. The negative side of the power supply is grounded to the sensor body.



## Outputs

The NPN and PNP outputs are open-collector outputs. The NPN output can sink up to 150mA and the PNP output can source up to 150mA. Outputs are short circuit protected by self-resetting internal fuses. These fuses will activate if the outputs are connected directly to ground or power. Repeated shorting will eventually cause the sensor to fail.




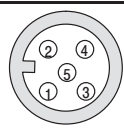
The PNP POWER IN voltage must be connected to a supply voltage and **must not exceed +Vin** (+30V DC).

## Output Polarity

Output polarity determines whether the output signal will go low or high on the label edge.

**Note:** Output polarity also depends on the direction of label movement through the sensor (see figure on page NO TAG).

## Wiring Table

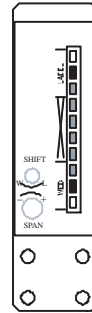
Designation	Lead Color (Cordset)	5-Pin Micro QD Pin Assignment
Termination		
V+	Brown	1
0V	Blue	2
PNP Output/150mA maximum	Black	3
NPN Output/150mA maximum	White	4
Output Polarity/Ground or +Vin	Grey	5

## Setting Up the Sensor

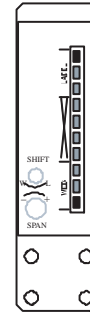
**Read this first: BASIC SETUP:** When labels are moving through a properly setup sensor, the lights on the display will move back and forth between WEB and LABEL. The goal of setup is to SHIFT the position and adjust the SPAN of the moving display lights so that the lights go from WEB to LABEL and do not ever stop in the X area between WEB and LABEL. The adjustment process is slightly different for different types of labels. If you want more specific instructions, see below.

**Labels Without Metal:** (a few inks can behave like metal in the sensor, use the combination setup in those cases)

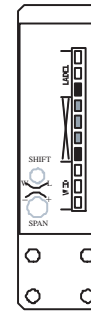
1. Move labels through the sensor (if moving labels back and forth be sure at least one complete label and the gap on each side of it are passing all the way through the sensor).
2. Adjust SHIFT to center the light movement on the display.
3. If end points of the light movement are in the X area, increase SPAN (Fig 3).
4. If end points of the light movement are the far outside lights, decrease SPAN (Fig. 2)



**Fig. 1**  
Ideal Setup



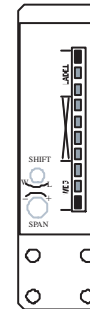
**Fig. 2**  
Too much span



**Fig. 3**  
Too little span and not centered

### All Metal Labels ( Metallic label material ):

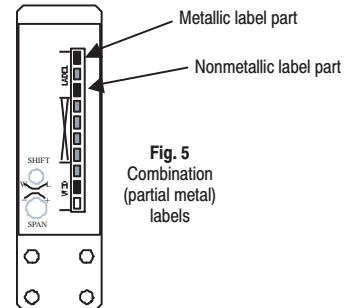
1. Set SPAN to minimum by turning SPAN at least 4 rotations toward the “-” mark.
2. It is important that metal labels be tight against the backing plate during setup and operation.
3. Move labels through the sensor (if moving labels back and forth be sure at least one complete label and the gap on each side of it are passing all the way through the sensor).
4. Adjust SHIFT to center the light movement on the display.
5. End points of the light movement will usually be between the far outside lights. This is normal for full metal labels (Fig. 4).
6. If the light movement is not between the far outside lights, increase SPAN until it is (Fig. 4).



**Fig. 4**  
Metallic label setup

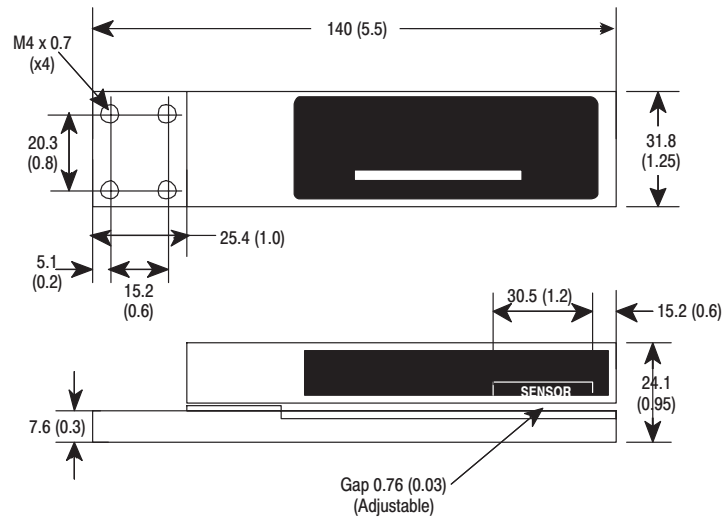
**Combination Labels with Some Metal:** (or inks that behave like metal)

1. Move labels through the sensor (if moving labels back and forth be sure at least one complete label and the gap on each side of it are passing all the way through the sensor).
2. Adjust SHIFT to center the light movement on the display.
3. Metallic areas will cause the light movement to go to the end light. If nonmetallic points (seen as intermediate stopping points of the light movement) are in the X area, increase SPAN.
4. If nonmetallic points (seen as intermediate stopping points of the light movement) are not seen, decrease SPAN.



**Fig. 5**  
Combination (partial metal) labels

**Dimensions—mm (inches)**



**Output Polarity and Signal Waveforms**

