SensorsX
SX-OMPHB Series

Photoelectric Label Sensor

Industrial Optical Sensor — Fork-Type Label Sensor



Max 10 kHz Response Frequency	**≤ 50 µs** Response Time	**3 × 60 mm** Slot Width × Depth (0.12 × 2.36 in)
IP65 Ingress Protection	**NPN / PNP** Switching Output, NO / NC Switchable	**12 – 24 V DC** Operating Voltage

Label Detection on Conveyors | Opaque Labels | Label / Gap Discrimination

■ PRODUCT OVERVIEW

The SensorsX SX-OMPHB series is a fork-type photoelectric sensor for detecting opaque labels and the gaps between them. It uses a 940 nm infrared light source and provides a maximum switching frequency of 10 kHz with a response time of 50 µs or less. The 3 mm-wide, 60 mm-deep slot accommodates the label web during detection.
Setup is performed using the SET button, with LED indicators showing the output mode, switching status and errors. Automatic level control adjusts the switching threshold. The sensor has a metal housing with IP65 protection. NPN and PNP models are available with cable or M8 connector connections, and the output function can be set to NO or NC.



■ KEY FEATURES

- ◆ **Opaque Label Detection** Photoelectric sensing for detecting opaque labels and label gaps
- ◆ **High-Speed Switching** Maximum switching frequency of 10 kHz; response time of 50 µs or less
- ◆ **Easy Adjustment** Setup using the SET button, with LED status indicators and error indication
- ◆ **Automatic Level Control** Automatically adjusts the switching threshold
- ◆ **Long Slot Design** Convenient label placement and detection
- ◆ **Metal Housing** Metal housing with IP65 protection

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■ TYPICAL APPLICATIONS

- Detecting opaque labels on moving label webs
- Detecting label gaps during label feeding and dispensing
- Checking label presence on backing material

■ PERFORMANCE SPECIFICATIONS

Dimensions	
Slot Width	3 mm (0.12 in)
Slot Depth	60 mm (2.36 in)
Detection	
Min. Detection Width	≥ 2 mm (0.08 in)
Min. Detection Depth	≥ 2 mm (0.08 in)
Light Source	940 nm (infrared emitter)
Conveyor Speed	≤ 20 m/min (0.3 m/s) / ≤ 65.6 ft/min
Response	
Response Frequency	Max. 10 kHz
Response Time	≤ 50 µs
Power-On Delay	≤ 300 ms

■ ELECTRICAL SPECIFICATIONS

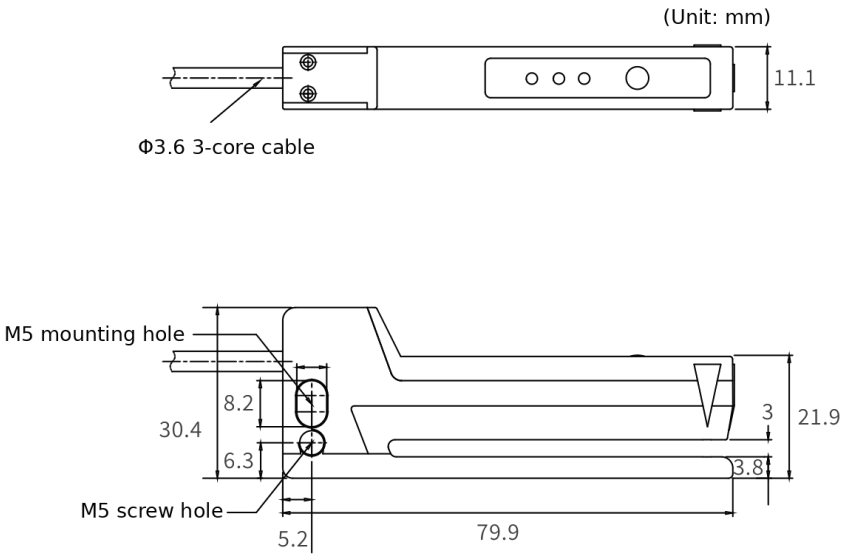
Power	
Operating Voltage	12 – 24 V DC
No-Load Current	≤ 30 mA
Output Signal	
Switching Output	NPN / PNP
Switching Output Function	NO (normally open) / NC (normally closed) switchable
Signal Voltage High / Low	≥ (UB − 2 V) / ≤ 2 V
Residual Voltage	≤ 2.5 V
Output Current	50 mA
Capacitive Load	≤ 0.2 µF
Error indication	Red LED
Indicators	
Red	Calibration error / operation error
Green	NO / NC
Blue	Switching output signal of label detection
Electrical Connection	
Connection	3-wire (brown / blue / black), cable length 2 m (6.56 ft); Φ3.6 mm (Φ0.14 in) 3-core cable
Connector Version	External M8 connector (see Wiring Diagram)

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■ ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating Temperature	−20 to +60 °C (−4 to +140 °F), no condensation or icing
Storage Temperature	30 to +70 °C (86 to 158 °F)
Mechanical & Environmental	
Ingress Protection	IP65
VDE Safety Class	III
Weight & Housing	
Material	Zinc die-cast, surface electroless nickel plating (silver); PC plastic
Weight	Approx. 55 g (1.94 oz); approx. 100 g (3.53 oz) with cable

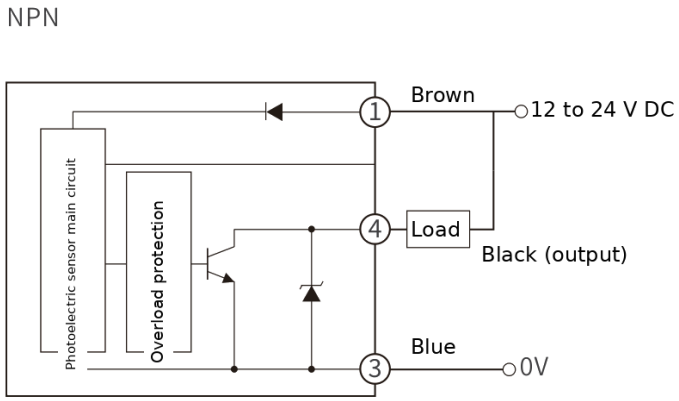
■ MECHANICAL DIMENSIONS



※ *All dimensions in mm.*

■ WIRING DIAGRAM

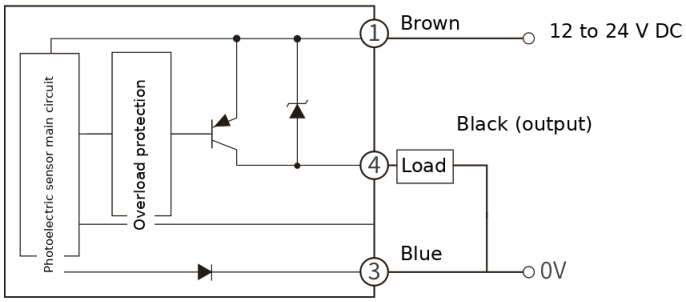
Input / Output Circuit — NPN



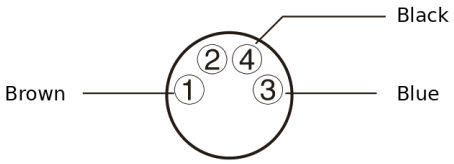
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Input / Output Circuit — PNP

PNP



External M8 Connector (Connector Versions)



M8 connector

Terminal Assignment

1 — Brown	12 – 24 V DC
3 — Blue	0 V
4 — Black	Switching output (to load)

■ CALIBRATION SETTINGS

NO Mode (Green Indicator Steady ON)

Move one or more labels off the backing material and push the blank area into the sensor.

- When the blank area is pushed to the detection center, the blue output indicator turns on.
- When a label is pushed to the detection center, the blue output indicator turns off.
- If set correctly, the LED turns on and off normally between labels and gaps.

Operation complete.

NC Mode (Green Indicator Steady OFF)

Move one or more labels off the backing material and push the blank area into the sensor.

- When the blank area is pushed to the detection center, the blue output indicator turns off.
- When a label is pushed to the detection center, the blue output indicator turns on.
- If set correctly, the LED turns on and off normally between labels and gaps.

Operation complete.

Adjusting the Switching Output Signal

(Switching signal output at the label gap / switching signal output at the label.) During operation the sensor normally uses this standard function. This product detects labels and their gaps accurately at high speed; observe mainly the blue output indicator and the switching output.

Calibration Teaching

For various labels, the SX-OMPHB label sensor provides a standard sensitivity suitable for high-speed, accurate detection.

Dynamic calibration preparation: insert the label web into the sensor.

Static calibration preparation:

- Remove the labels from the backing material and push the blank area into the sensor.
- Press and hold the calibration button for 3 s until the green and blue LEDs flash simultaneously.
- Release the calibration button.

Dynamic teaching:

- Push a label web at a maximum speed of 20 m/min (65.6 ft/min) through the sensor so that at least 3 – 7 labels pass the sensor.
- Briefly press the calibration button once to end the calibration; the sensor enters standard mode.

Static teaching:

- Keep the blank area in the detection zone of the sensor.
- Briefly press the calibration button once to end the calibration; the sensor enters standard mode.
- If the calibration is wrong (e.g. the label is transparent material or the material is uneven), the red LED turns on, the green and blue LEDs flash rapidly, and an error output signal is generated.

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- When an error occurs, the calibration must be repeated. If the error cannot be corrected after recalibration, this type of label is not suitable for the SX-OMPHB.

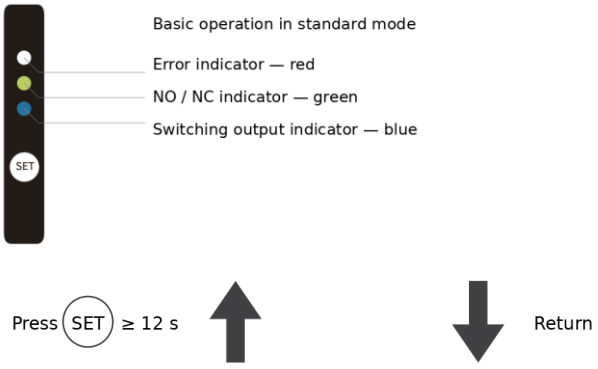
Indicators (NO Mode as Example)



NO / NC indicator — green	Lights steadily while the sensor is in operation.
Output indicator — blue	Displays the switching output signal; the LED turns on when a label gap is detected.
Error indicator — red	Off if there is no operation error; on if the setting limit is reached or the last calibration was improper.

Operating Procedure

The calibration button must be pressed for at least 3 s to operate this product.



Calibrating "NO / NC mode" — setting the switching output: switching signal at gap / label

The green LED is steadily on. Press the SET key again; if switching output on / off works normally with the current setting (the blue output indicator turns on and off normally and the switching output switches normally), the setting is complete.

Blue LED: on = signal output at gap; off = signal output at label.

[NC setting] Press and hold the SET key for 12 s; the green and blue LEDs flash simultaneously. After 12 s the green LED goes off. Press the button again; if switching output on / off works normally with the current setting (the blue output indicator turns on and off normally and the switching output switches normally), the setting is complete.



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Calibrating "set detection object" (NO mode as example) — for non-transparent label detection (static or moving)
For NO setting, press and hold the SET key for 12 s; the green and blue LEDs flash simultaneously. After 12 s, place the gap or blank area of the label to be detected under the detection area and press and hold the SET key for 3 s; the green and blue LEDs flash simultaneously. Place the label to be detected under the detection area and press the SET key to stop the calibration; the blue LED goes off and the green LED stays on. Freely move between label and gap in the sensor; if the blue output indicator turns on and off normally, the setting is correct.
Error indicator — red: if the calibration has no error, the red LED is off.
* In NC mode, detection is exactly the opposite of NO mode.



■ ORDERING INFORMATION — SX-OMPHB

Complete model number example: SX-OMPHBB12N1

Slot Dimensions	
B12	Slot 3 × 60 mm (0.12 × 2.36 in)
Output	
N	NPN
P	PNP
Electrical Connection	
1	Cable
2	M8 connector
Customized (Optional)	
D	Customized — specify requirements in order remarks

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