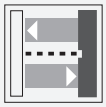
# Background suppression sensor

## MLV41-8-H-120-RT-IO/65b/98/103



- Rugged series in corrosion-resistant metal housing
- MPT Multi Pixel Technology
- IO-Link interface for service and process data
- Reliable detection of all surfaces, independent of color and structure
- Precision background suppression, adjustable
- Low sensitivity to target color
- Clear and functional display concept for the operating modes

Diffuse sensor with measurement core technology, compact housing design, background suppression and 3 further adjustable operating modes, IO-Link interface, 120 mm adjustable detection range, red light, 2 push-pull outputs, M8 plug

## Function

The diffuse mode sensor with MPT technology combines the benefits of the triangulation principle with the measuring functionality of a distance sensor. The integrated measuring principle provides an extremely wide range of switching element functions in one device, along with a large detection range and a small black/white difference up to the final detection range. The sensor is equipped with an IO-Link interface, through which the measuring principle is optimized to the requirements of the relevant application.

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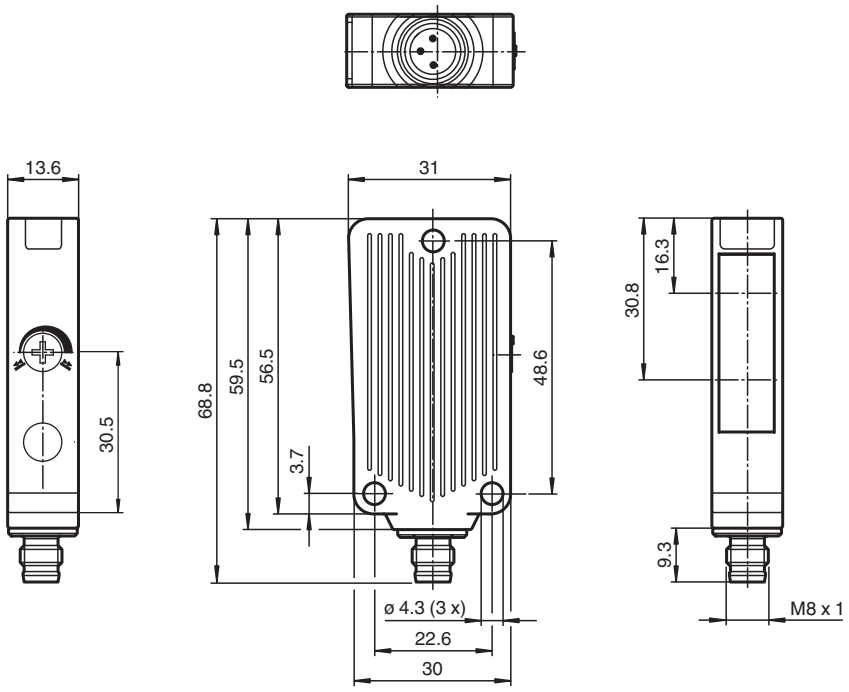
## Dimensions




## Technical Data

| | |
|---|---|
| **General specifications** | |
| Detection range | 20 ... 120 mm<br>Black-white difference < 3% |
| Adjustment range | 20 ... 120 mm |
| Diagnosis range | 20 ... 120 mm |
| Reference target | standard white, 100 mm x 100 mm |
| Light source | LED |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 4 mm at sensor range 100 mm |
| Opening angle | approx. 2.5 ° |
| Ambient light limit | 25000 Lux |
| **Functional safety related parameters** | |
| $MTTF_d$ | 500 a |
| Mission Time ($T_M$) | 20 a |
| Diagnostic Coverage (DC) | 0 % |
| **Indicators/operating means** | |
| Operation indicator | LED green, statically lit Power on , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz) |
| Function indicator | 2 LEDs yellow<br>ON: object inside the scanning range<br>OFF: object outside the scanning range |
| Control elements | Sensing range adjuster |
| Parameterization indicator | IO link communication: green LED goes out briefly (1 Hz) |
| **Electrical specifications** | |

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## Technical Data

| | | |
|---|---|---|
| Operating voltage | $U_B$ | 10 ... 30 V DC , class 2 |
| Ripple | | max. 10 % |
| No-load supply current | $I_0$ | max. 25 mA at 24 V supply voltage |
| **Interface** | | |
| Interface type | | IO-Link |
| Protocol | | IO-Link V1.0 |
| Mode | | COM2 (38.4 kBaud) |
| **Output** | | |
| Switching type | | dark-on |
| Signal output | | 1 PNP output, short-circuit protected, reverse polarity protected, open collector |
| Switching voltage | | max. 30 V DC |
| Switching current | | max. 100 mA |
| Voltage drop | $U_d$ | ≤ 2 V DC |
| Switching frequency | f | 200 Hz |
| Response time | | 2.5 ms |
| **Conformity** | | |
| Product standard | | EN 60947-5-2 |
| **Approvals and certificates** | | |
| EAC conformity | | TR CU 020/2011 |
| UL approval | | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) |
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |
| **Ambient conditions** | | |
| Ambient temperature | | -20 ... 60 °C (-4 ... 140 °F)<br>60 ... 70 °C (140 ... 158 °F) ; max. 20,000 hours = 2.5 years (continuous operation) |
| Storage temperature | | -40 ... 75 °C (-40 ... 167 °F) |
| **Mechanical specifications** | | |
| Housing width | | 31 mm |
| Housing height | | 56.5 mm |
| Housing depth | | 13.6 mm |
| Degree of protection | | IP67 |
| Connection | | M8 x 1 connector, 3-pin |
| Material | | |
| Housing | | Aluminum , Delta-Seal coated |
| Optical face | | glass pane |
| Connector | | metal |
| Mass | | approx. 40 g |

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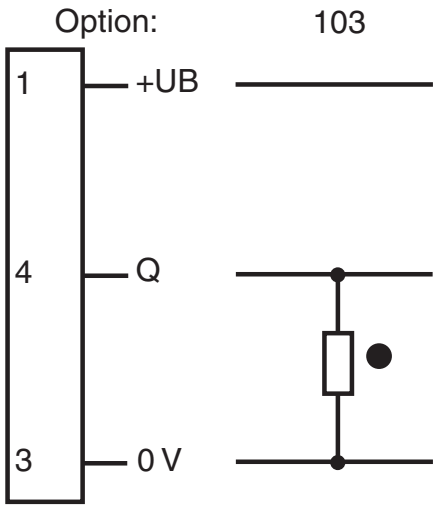
## Connection Assignment



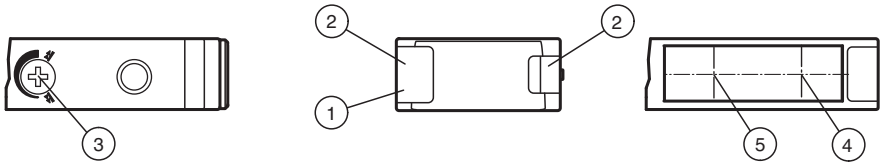

○ = Light on
● = Dark on

## Connection Assignment


Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

## Assembly




| | | | | | |
|---|---|---|---|---|---|
| 1 | Operating display green | 3 | Sensing range adjuster | 5 | Optical axis receiver |
| 2 | Function display yellow | 4 | Optical axis transmitter | | |

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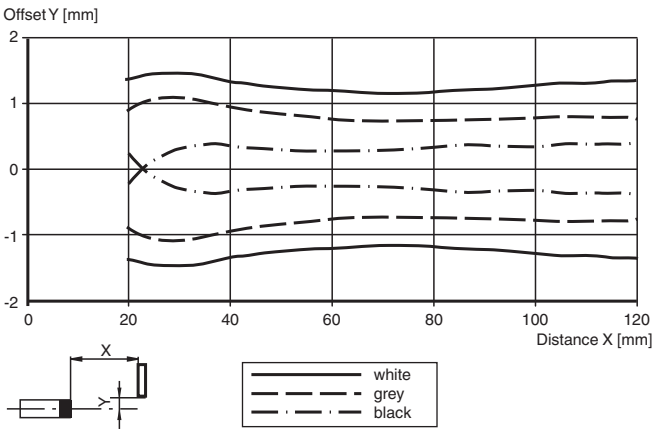
## Characteristic Curve

### Characteristic response curve




## Accessories

| | | |
|---|---|---|
|  | **OMH-09** | Mounting bracket for Sensors series MLV41 for M12 rod mounting |
|  | **OMH-40** | Mounting bracket |
|  | **V3-WM-2M-PUR** | Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey |
|  | **ICE2-8IOL-G65L-V1D** | EtherNet/IP IO-Link master with 8 inputs/outputs |
|  | **ICE3-8IOL-G65L-V1D** | PROFINET IO IO-Link master with 8 inputs/outputs |
|  | **ICE1-8IOL-G30L-V1D** | Ethernet IO-Link module with 8 inputs/outputs |
|  | **ICE1-8IOL-G60L-V1D** | Ethernet IO-Link module with 8 inputs/outputs |
|  | **ICE2-8IOL-K45P-RJ45** | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors |
|  | **ICE2-8IOL-K45S-RJ45** | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal |
|  | **ICE3-8IOL-K45P-RJ45** | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals |
|  | **ICE3-8IOL-K45S-RJ45** | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal |
|  | **IO-Link-Master02-USB** | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |

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## Configuration

**Detection range adjustment:**

The detection range can be set via the rotary switch or the IO-Link.

**Setting using the rotary switch:**

If you would like to change the detection range on the sensor, turn:

- the rotary switch to the left to reduce the value.
- the rotary switch to the right to increase the value.

With the IO-Link, the set detection range the current rotary switch configuration is always assigned. If the rotary switch is too far to the left or the right, perform the following:

Increasing the detection range:

Turn the potentiometer completely to the right until it stops. The LED will briefly flash green. The assignment of the current rotary switch configuration to the detection range set via IO-Link is overridden. Now set the desired detection range again.

Reducing the detection range:

Turn the potentiometer completely to the left until it stops. The LED will briefly flash green. The assignment of the current rotary switch configuration to the detection range set via IO-Link is overridden. Now set the desired detection range again.

**Example application - manually reduce detection range:**

The potentiometer has one position as shown here. The adjustable detection range is 20 mm ... 120 mm and is set via IO-Link to 100 mm. The rotary switch is too far to the left to set a detection range of 40 mm for example.

Turn the potentiometer to the left until it stops to override the set value to this rotary switch configuration. The LED will briefly flash green.

Now set the desired detection range again between 20 mm ... 120 mm.

## Configuration

**Setting different operating modes via IO-Link interface**

The devices have an IO-Link interface as standard for diagnostic and parameterization tasks enabling optimum adaptation of the sensors to the application. In addition, four different operating modes can be set:

**Background suppression operating mode (1 or 2 switching points):**

- Detection of objects irrespective of type and color in a defined sensing range. Objects in the background are reliably suppressed
- Background suppression with 2 switching points


**Background evaluation operating mode:**

- Detection of objects irrespective of type and color against a defined background. Reliable detection of objects at close range (detection range ≥ 0 mm). The background serves as reference


**Window operation operating mode:**

- Detection of objects irrespective of type and color in a defined sensing range. Reliable detection when leaving the defined sensing range.


**Hysteresis operating mode:**

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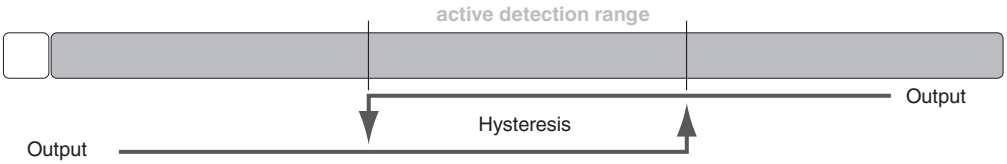
- Detection of objects irrespective of type and color between a defined switch-on and switch-off point




To use the diagnostic and parameterization options, you will find the compatible IODD, and if required, the FDT base application PACTware in the download area at **www.pepperl-fuchs.com**.

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