The miniature photoelectric sensors in the W4SL-3 product family are the number one choice where the detection of minute and transparent objects is concerned. They are the ideal solution even under critical ambient conditions such as ambient light from modern energy-saving lights or when detection through small drill holes is required. The latest laser and ASIC technology from SICK makes this possible.
Reliable detection of the smallest objects

The extremely small light spot of the W4SL-3 miniature photoelectric sensors provides the ideal starting point for precise object and product detection in automation. It makes the sensors ideal for precise position, presence, overhang and height checks involving the smallest objects, even under critical light conditions. The precise laser light spot supports switching with maximum accuracy, thus providing the basis not only for optimum product quality but also for reduced machine downtime as there are fewer switching errors.

Versatility for many industries

W4SL-3 miniature photoelectric sensors are perfect for the packaging industry, the automotive and part supplier industries, the electronics industry and the solar industry. But that’s not all: they even deliver optimum results in machine tool building, in the food and beverage industry, and the pharmaceutical industry. Applications include examining grippers in the automotive industry, inspecting dies in machine tool building, or edge detection of semiconductor wafer carriers.

For more information, visit www.sick.com/de/W4SL-3.

W4SL-3 miniature photoelectric sensors:
High performance for high expectations

With their precise laser light spot, the new W4SL-3 miniature photoelectric sensors are setting new standards by providing high optical immunity to undesired background reflections and immunity to ambient light from modern energy-saving bulbs. They also are impressive with maximum mechanical and electromechanical ruggedness.

Reliable switching in all environments

The photoelectric proximity sensors in the WTB4SL-3 product family outperform all other laser sensors currently available on the market. In everyday production, they have absolutely no sensitivity to all active and passive sources of light interference. High-frequency lights or any type of reflection, reflective metal surfaces, windows or high-visibility vests – none of these sources of optical interference will trigger a switching signal incorrectly from a WTB4SL-3 photoelectric proximity sensor. Accordingly, these sensors reduce incorrect switching and avoid consequential machine downtime.

Lowering costs and creating new solutions

Best-in-class performance for background suppression creates maximum freedom in machine design, as changing and reflective backgrounds of dead spots no longer pose a problem for the application.
W4SL-3 miniature photoelectric sensors: The best clear object detection in their class

The photoelectric retro-reflective sensors in the W4SL-3 product family stand out in their class with the best detection performance for transparent glass and plastic objects—all with just one device. They provide the ideal starting point for efficient and automated production.

Duo mode: One sensor for two applications

W4SL-3 photoelectric retro-reflective sensor ist supplied as standard with a switchable operating mode for detecting transparent objects and a mode with non-transparent objects can be detected. Simply press a button to switch between the two user modes. A single device can detect, for example, not only transparent vials and PET bottles but also metallic needles and wires, thus reducing the variety of sensors and their storage costs.

Fully automatic: adaptation to contamination

The photoelectric retro-reflective sensors in the W4SL-3 product family automatically adapt to changing light conditions. If dust or dirt collects on the sensor lens over time, the microprocessor responds to the reduced incidence of light and adjusts the switching threshold accordingly. Once the sensor lens has been cleaned, the original signal level is restored automatically—a significant reduction in maintenance time and costs from all angles.

Absolutely reliable: detection of clear objects

The aim: best possible performance in clear object detection. The solution: the SICK photoelectric sensor package, comprising the innovative ASIC, an autocollimation lens, and two polarizing filters. Thanks to three features: the W4SL-3 photoelectric retro-reflective sensors are able to offer the best detection of transparent or shiny surfaces and objects in their class. They are able to detect clear glass surfaces just as reliably as small vials, tape edges, and PET bottles.

<table>
<thead>
<tr>
<th>W4SL-3 product type</th>
<th>Laser class</th>
<th>Sensing range</th>
<th>Diameter of light spot</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTB4SL-3</td>
<td>1</td>
<td>25 – 300 mm/ 25 – 170 mm</td>
<td>Ø &lt; 1 mm (170 mm)</td>
</tr>
<tr>
<td>WL4SL-3</td>
<td>1</td>
<td>12 m</td>
<td>Ø 1 mm (500 mm)</td>
</tr>
<tr>
<td>WSE4SL-3</td>
<td>1</td>
<td>70 m / 50 m</td>
<td>Ø 1 mm (500 mm)</td>
</tr>
<tr>
<td>WL4SLG-2 for detection of transparent objects</td>
<td>1</td>
<td>4.5 m</td>
<td>Ø 1 mm (500 mm)</td>
</tr>
</tbody>
</table>

1) On white / on black. 2) Based on the ‒0.05V reflector. 3) Max. recommended sensing range. 4) Based on 101%AD100C reflective tape.
A laser sensor must be capable of quality in every millimeter

Stable housing, proven mounting
Systematic production and testing procedures safeguard the high mechanical quality of the sensor. A compact plastic housing measuring 19 x 12.2 x 17.3 mm (H x W x D) encases all W4SL-3 miniature photoelectric sensors. The hole spacing is the same as is featured on the W4S-3 mounting system, which is already successful in the automation.

Reliable thanks to high EMC safety
The high-quality design and manufacture of the housing continues with the electronics inside the sensor: W4SL-3 miniature photoelectric sensors with laser technology are impressive with high insensitivity to all kinds of electromagnetic interference.

IO-Link: The world as seen by a sensor
The W4SL-3 miniature photoelectric sensors with laser technology also feature IO-Link technology, meaning that they can be used for initial diagnosis of system performance. Additional functions such as teach-in or profile detection can be integrated directly into the sensor, rendering complex programming of controllers unnecessary. Further advantages:
• Exact and precise configuration
• Support of remote control and remote monitoring
• Straightforward transfer of analog values
• Wire break detection
• Can be connected to any fieldbus
• Predicative error detection
• Intelligent additional functions in the sensor

Precise detection of tiny objects in the harshest industrial environments

Product description
The WTB4SL-3 photoelectric proximity sensor features a high-precision laser light spot for reliably detecting tiny objects such as syringe needles, wires, or drilled holes, even under adverse ambient conditions. Both active and passive sources of interference such as modern energy-saving lamps and background reflections do not impair detection reliability, meaning that process reliability is not affected. The combination of SICK’s latest proprietary laser and ASIC technologies meets the demanding requirements for detection quality. The sensing range is between 25 and 300 mm.

At a glance
• Precise laser light spot, laser class 1
• Latest SICK proprietary ASIC and laser technologies with second emitter LED to provide outstanding background suppression and ambient light immunity
• Sensing range between 25 and 300 mm

Your benefits
• Precise laser light spot for highly accurate switching behavior
• High optical ambient light immunity reduces incorrect switching and thus machine downtime, even when modern energy-saving lamps are used
• High-quality sensor manufacturing and testing reduce maintenance costs
• The highest degree of machine design flexibility and outstanding DOE (background suppression) minimizes the effect of background reflections
• Established and proven housing design
• High-quality sensor manufacturing and testing for mechanical ruggedness
• Choice of adjustment via teach-in button, 5-turn potentiometer, or cable

Additional information
Detailed technical data...9
Ordering information...10
Dimensional drawings...11
Connection diagram...11
Black/white shift...12
Sensing range...12
Light spot size...12

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.
### Detailed technical data

#### Features

- **Sensor principle**: Photoelectric proximity sensor
- **Detection principle**: Background suppression
- **Dimensions (W x H x D)**: 12.2 mm x 41.8 mm x 17.3 mm
- **Mounting hole**: M3
- **Sensing range max.**: 25 mm ... 300 mm
- **Type of light**: Visible red light
- **Wave length**: 650 nm
- **Light spot size (distance)**: Ø 1 mm (170 mm)
- **Sensitivity adjustment**: Potentiometer, 5-turn

#### Mechanics/electronics

- **Supply voltage**: 10 V DC ... 30 V DC
- **Residual ripple**: \(< 5 \text{ V}_{\text{pp}}\)
- **Power consumption**: \(\leq 30 \text{ mA}\)
- **Switching output**: PNP, light/dark-switching, complementary 1)
- **Output current \(I_{\text{max}}\)**: \(\leq 100 \text{ mA}\)
- **Response time**: \(\leq 0.5 \text{ ms}\)
- **Switching frequency**: 1,000 Hz
- **Connection type**: Cable with connector, 120 mm, PVC, 0.14 mm² 2)
- **Circuit protection**: A 3), B 4), C 5)
- **Protection class**: 6)
- **Weight**: 20 g (Connector, M8, 4-pin), 45 g (Cable with connector, M8, 4-pin), 10 g (Connector, 4-wire)
- **Housing material**: Bayblend Plastic
- **Optics material**: PMMA
- **Enclosure rating**: IP 66, IP 67

#### Ordering information

<table>
<thead>
<tr>
<th>Sensing range max. 1)</th>
<th>Output function</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm ... 300 mm</td>
<td>PNP</td>
<td>Connector, M8, 4-pin</td>
<td>WTB4SL-P2261 1058237</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WTB4SL-P3261 1058238</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable, 4-wire, 2 m, PVC</td>
<td>WTB4SL-P1161 1058239</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPN</td>
<td>Connector, M8, 4-pin</td>
<td>WTB4SL-N2261 1058240</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WTB4SL-N3261 1058241</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable, 4-wire, 2 m, PVC</td>
<td>WTB4SL-N1161 1058242</td>
<td></td>
</tr>
</tbody>
</table>

1) Object with 20 % reflectance (default: 10 % standard, when \(\alpha = 5500\))

2) Average service life \(50,000 \text{ h at } T_{\text{a}} = +25 \text{ °C}\)

3) Limit values, operation in short-circuit protected network max. 8 A

4) May not exceed or fall short of \(V_s\)

5) Without load.

6) \(Q = \text{light-switching}\).

7) Signal transit time with resistive load.


9) Do not bend below 0 °C.

10) \(A = V_s\) connections reverse-polarity protected.

11) \(B = \text{inputs and output reverse-polarity protected}\).

12) \(C = \text{interference suppression}\).

13) As of \(T_{\text{a}} = 50 \text{ °C}\), a max. supply voltage \(V_{\text{max}} = 24 \text{ V}\) and a max. load current \(I_{\text{max}} = 50 \text{ mA}\) is permitted.

14) Using the sensor below \(T_{\text{a}} = 10 \text{ °C}\) is possible, if the sensor is turned on at \(T_{\text{a}} = 10 \text{ °C}\), then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below \(T_{\text{a}} = 10 \text{ °C}\).
Miniature photoelectric sensors

WTB4SL-3

Dimensional drawings

1. Standard direction of the material being scanned
2. Center of optical axis, sender
3. Center of optical axis, receiver
4. Status indicator LED, green: power on
5. Status indicator LED, yellow: Status of received light beam
6. Potentiometer
7. Threaded mounting hole M3
8. Connection
dimensions in mm (inch)

Connection diagram

<table>
<thead>
<tr>
<th>WTB4SL-3x1xx</th>
<th>WTB4SL-3x2xx (Cable with) connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>L+</td>
<td>L+</td>
</tr>
<tr>
<td>Q</td>
<td>Q</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

Black/white shift

<table>
<thead>
<tr>
<th>% of sensing range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
</tr>
<tr>
<td>18%</td>
</tr>
</tbody>
</table>

Sensing range

<table>
<thead>
<tr>
<th>Sensing range</th>
<th>Sensing range on black, 6% remission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sensing range on gray, 18% remission</td>
</tr>
<tr>
<td>2</td>
<td>Sensing range on white, 90% remission</td>
</tr>
</tbody>
</table>

Light spot size

<table>
<thead>
<tr>
<th>Sensing range</th>
</tr>
</thead>
</table>

Dimensions in mm (inch)

<table>
<thead>
<tr>
<th>Vertical</th>
<th>Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm</td>
<td>0.6 (0.02)</td>
</tr>
<tr>
<td>100 mm</td>
<td>1.1 (0.04)</td>
</tr>
<tr>
<td>200 mm</td>
<td>0.9 (0.04)</td>
</tr>
<tr>
<td>300 mm</td>
<td>0.8 (0.03)</td>
</tr>
</tbody>
</table>
Miniature photoelectric sensors

**WTB4SL-3**

**WL4SL-3**

Miniature photoelectric sensors

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**Product description**

The WL4SL-3 photoelectric retro-reflective sensor has a long sensing range of up to 12 m. The highly visible homogeneous laser light spot has a sharp contour to facilitate alignment. The photoelectric sensors use autocollimation technology to ensure that the sensor also reliably detects close-range objects. This technology also enables detection through narrow gaps or very small drilled holes. The photoelectric sensors also provide an IO-Link interface to allow performing initial system performance diagnostics. In addition, IO-Link permits the integration of additional functions such as meters directly into the sensor. There is no need for complex control programming.

**At a glance**

- Precise laser light spot, laser class 1
- Long sensing range up to 12 m
- Autocollimation optics prevent blind spots
- Established and proven housing design
- High-quality sensor manufacturing and testing for mechanical ruggedness
- Choice of adjustment via teach-in button, 5-turn potentiometer, cable, or IO-Link

**Your benefits**

- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- Sensing ranges between 0 and 12 m permit both short- and long-range use
- The highest degree of machine design flexibility. Autocollimation permits detection even through small drilled holes
- High-quality sensor manufacturing and testing reduce maintenance costs
- Established and proven housing design for easy installation
- IO-Link facilitates initial system performance diagnostics and uses additional sensor functions to reduce complex control programming

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**Additional information**

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- Ordering information: 16
- Dimensional drawings: 17
- Connection diagram: 11
- Operating reserve: 18
- Sensing range: 18
- Light spot size: 18

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For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

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Miniature photoelectric sensors

**WL4SL-3**

### Detailed technical data

#### Features
- **Sensor principle**: Photoelectric retro-reflective sensor
- **Detection principle**: Autocollimation
- **Dimensions (W x H x D)**: 12.2 mm x 41.8 mm x 17.3 mm
- **Mounting hole**: M3
- **Sensing range max.**: 0 m ... 12 m
- **Sensing range**: 0 m ... 8 m
- **Type of light**: Visible red light
- **Light source**: Laser
- **Wave length**: 650 nm
- **Light spot size (distance)**: Ø 1 mm (500 mm)
- **Sensitivity adjustment**: Single teach-in button and teach-in via cable (depending on type)

#### Mechanics/electronics
- **Supply voltage**: 10 V DC ... 30 V DC
- **Residual ripple**: < 5 \( V_{pp} \)
- **Power consumption**: \( \leq 30 \text{ mA} \)
- **Switching output**: PNP, dark-switching
  - PNP, light/dark-switching, complementary
  - NPN, dark-switching
  - NPN, light/dark-switching, complementary
- **Output current**: \( \leq 100 \text{ mA} \)
- **Response time**: \( \leq 0.5 \text{ ms} \)
- **Switching frequency**: 1,000 Hz
- **Connection type**: Cable with connector, 120 mm, PVC, 0.14 mm²
- **Circuit protection**: A
- **Protection class**: B
- **Weight**: Cable with connector, M8, 4-pin 20 g
- **Optics material**: PMMA

### Ordering information

#### Sensing range max.

<table>
<thead>
<tr>
<th>Output function</th>
<th>Switching mode</th>
<th>Sensitivity adjustment</th>
<th>ID-Link</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 m ... 12 m</td>
<td>Dark-switching</td>
<td>Single teach-in button and teach-in via cable</td>
<td>–</td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WL4SL-3F3234</td>
<td>1061564</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>Connector, M8, 4-pin</td>
<td>WL4SL-3F2234</td>
<td>1061562</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light/dark-switching</td>
<td>Single teach-in button</td>
<td>–</td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WL4SL-3P3232</td>
<td>1061563</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>Connector, M8, 4-pin</td>
<td>WL4SL-3P2232</td>
<td>1061561</td>
<td></td>
</tr>
</tbody>
</table>

---

1) PL2BA.
2) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)
3) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

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**WL4SL-3**

### Enclosure rating

<table>
<thead>
<tr>
<th>IP</th>
<th>Miniature photoelectric sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td></td>
</tr>
</tbody>
</table>

#### Ambient operating temperature

<table>
<thead>
<tr>
<th>Temperature</th>
<th>WL4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10 °C ... +50 °C</td>
<td></td>
</tr>
</tbody>
</table>

#### Ambient storage temperature

<table>
<thead>
<tr>
<th>Temperature</th>
<th>WL4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30 °C ... +70 °C</td>
<td></td>
</tr>
</tbody>
</table>

---

**WL4SL-3**

### Ambient operating temperature extended

<table>
<thead>
<tr>
<th>Temperature</th>
<th>WL4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30 °C ... +55 °C</td>
<td></td>
</tr>
</tbody>
</table>

---

**WL4SL-3**

### Ambient storage temperature extended

<table>
<thead>
<tr>
<th>Temperature</th>
<th>WL4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30 °C ... +70 °C</td>
<td></td>
</tr>
</tbody>
</table>

---

**WL4SL-3**

### Ordering information

#### Sensing range

<table>
<thead>
<tr>
<th>Output function</th>
<th>Switching mode</th>
<th>Sensitivity adjustment</th>
<th>ID-Link</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 m ... 12 m</td>
<td>Dark-switching</td>
<td>Single teach-in button and teach-in via cable</td>
<td>–</td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WL4SL-3F3234</td>
<td>1061564</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>Connector, M8, 4-pin</td>
<td>WL4SL-3F2234</td>
<td>1061562</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light/dark-switching</td>
<td>Single teach-in button</td>
<td>–</td>
<td>Cable with connector, M8, 4-pin, 120 mm, PVC</td>
<td>WL4SL-3P3232</td>
<td>1061563</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>Connector, M8, 4-pin</td>
<td>WL4SL-3P2232</td>
<td>1061561</td>
<td></td>
</tr>
</tbody>
</table>

---

1) PL2BA.
2) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)
3) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)
Miniature photoelectric sensors

WL4SL-3

Dimensional drawings

Operating reserve

Sensing range

Connection diagram

WL4SL-3x11x4 Cable

WL4SL-3x11x2 Cable

WL4SL-3x2x4 (Cable with) connector

WL4SL-3x2x2 (Cable with) connector

Connection

Status indicator LED green: power on

Status indicator LED yellow: Status of received light beam

Single teach-in button

Overview

Light spot size

Dimensions in mm (inch)

Subject to change without notice
Product description

The WL4SLG-3 detects all types of objects, including transparent vials, PET bottles, metallic needles, and wires, thus reducing the variety of sensors and their storage costs. The precise, highly visible laser light spot ensures a high level of detection quality and facilitates sensor alignment. Autocollimation technology ensures that the sensor reliably detects objects at close range and through small drilled holes. The sensor uses automatic switching threshold adaptation to adjust automatically to changing light conditions, helping ensure maintenance-free system operation. The photoelectric sensors also provide an IO-Link interface to allow performing initial system performance diagnostics. Furthermore, IO-Link permits the integration of additional functions such as meters directly into the sensor. There is no need for complex control programming.

At a glance

- Precise laser light spot, laser class 1
- Teach-in button can be switched between detection of transparent and smallest non-transparent objects
- Automatic switching threshold adaptation provides automatic adjustment to changes in light conditions
- Sensing ranges up to 4.5 m
- Autocollimation optics prevent blind spots
- Choice of adjustment via teach-in button, potentiometer, cable, or IO-Link

Your benefits

- One device for detecting both transparent objects and the smallest non-transparent objects at sensing ranges up 4.5 m, thus reducing the variety of sensors and saving on storage costs
- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- The highest degree of machine design flexibility. Autocollimation permits detection even through small drilled holes
- High-quality sensor manufacturing and testing reduce maintenance costs
- Established and proven housing design for easy installation
- IO-Link facilitates initial system performance diagnostics and uses additional sensor functions to reduce complex control programming

Additional information

- Detailed technical data: 22
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- Light spot size: 24

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

**Miniature photoelectric sensors**

### Detailed technical data

#### Features

<table>
<thead>
<tr>
<th>Sensor principle</th>
<th>Photoelectric retro-reflective sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection principle</td>
<td>Autocollimation</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>12.2 mm x 41.8 mm x 17.3 mm</td>
</tr>
<tr>
<td>Housing design (light emission)</td>
<td>Rectangular / Slim</td>
</tr>
<tr>
<td>Mounting hole</td>
<td>M3</td>
</tr>
<tr>
<td>Sensing range max. 1,2</td>
<td>0 m ... 4.5 m</td>
</tr>
<tr>
<td>Sensing range 3</td>
<td>0 m ... 2 m</td>
</tr>
<tr>
<td>Type of light</td>
<td>Visible red light</td>
</tr>
<tr>
<td>Light source</td>
<td>Laser</td>
</tr>
<tr>
<td>Wave length</td>
<td>650 mm</td>
</tr>
<tr>
<td>Light spot size (distance)</td>
<td>Ø 1 mm (500 mm)</td>
</tr>
<tr>
<td>Sensitivity adjustment</td>
<td>Single teach-in button and teach-in via cable 2 (depending on type)</td>
</tr>
</tbody>
</table>

1) REF-AC1000.
2) Average service life 50,000 h at Ta = +25 °C.
3) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN).

#### Mechanics/electronics

<table>
<thead>
<tr>
<th>Supply voltage 1</th>
<th>10 V DC ... 30 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual ripple 2</td>
<td>&lt; 5 V_h</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Switching output</td>
<td>PNP: dark-switching 6</td>
</tr>
<tr>
<td></td>
<td>PNP: light/dark-switching, complementary 6</td>
</tr>
<tr>
<td></td>
<td>NPN: dark-switching 7</td>
</tr>
<tr>
<td></td>
<td>NPN: light/dark-switching, complementary 7 (depending on type)</td>
</tr>
<tr>
<td>Output current I_{max}</td>
<td>≤ 100 mA</td>
</tr>
<tr>
<td>Response time 6</td>
<td>≤ 0.5 ms</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>1,000 Hz</td>
</tr>
<tr>
<td>Connection type</td>
<td>Cable with connector, 120 mm, PVC, 0.14 mm² 6</td>
</tr>
<tr>
<td></td>
<td>Cable, 2 m, PVC, 0.14 mm² 6</td>
</tr>
<tr>
<td></td>
<td>Connector (depending on type)</td>
</tr>
<tr>
<td>Circuit protection</td>
<td>A 6</td>
</tr>
<tr>
<td></td>
<td>B 10</td>
</tr>
<tr>
<td></td>
<td>C 11</td>
</tr>
<tr>
<td>Protection class</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>20 g</td>
</tr>
<tr>
<td></td>
<td>Cable with connector, MB, 4-pin</td>
</tr>
<tr>
<td></td>
<td>Cable, 4-pin 45 g</td>
</tr>
<tr>
<td></td>
<td>Connector, 4-wire 10 g</td>
</tr>
<tr>
<td>Device filter</td>
<td>✓</td>
</tr>
<tr>
<td>IO-Link</td>
<td>✓ (COM2)</td>
</tr>
<tr>
<td>Housing material</td>
<td>Bakelit Plastic</td>
</tr>
</tbody>
</table>

#### Optics material

PMMA

#### enclosure rating

IP 66

IP 67

#### Ambient operating temperature

-10 °C ... +50 °C

#### Ambient operating temperature extended

-30 °C ... +55 °C

#### Ambient storage temperature

-30 °C ... +70 °C

### Ordering Information

<table>
<thead>
<tr>
<th>Sensing range max. 1</th>
<th>Output function</th>
<th>Switching mode</th>
<th>Sensitivity adjustment</th>
<th>IO-Link</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 m ... 4.5 m</td>
<td>Dark-switching</td>
<td>Single teach-in button and teach-in via cable 2</td>
<td>–</td>
<td>Cable with connector, MB, 4-pin, 120 mm, PVC</td>
<td>WL4SLG-3F234</td>
<td>1058246</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Connector, MB, 4-pin</td>
<td>WL4SLG-3F234</td>
<td>1058244</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light/dark-switching</td>
<td>Single teach-in button</td>
<td>–</td>
<td>Cable with connector, MB, 4-pin, 120 mm, PVC</td>
<td>WL4SLG-3F232</td>
<td>1058245</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>COM2 Connector, MB, 4-pin</td>
<td>WL4SLG-3F232</td>
<td>1061266</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Connector, MB, 4-pin</td>
<td>WL4SLG-3F232</td>
<td>1058243</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dark-switching</td>
<td>Single teach-in button and teach-in via cable 2</td>
<td>–</td>
<td>Cable, 4-wire, 2 m, PVC</td>
<td>WL4SLG-3E1134</td>
<td>1058248</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light/dark-switching</td>
<td>Single teach-in button</td>
<td>–</td>
<td>Cable, 4-wire, 2 m, PVC</td>
</tr>
</tbody>
</table>

1) REF-AC1000.
2) Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN).

---

Additional notes:

- Limit values, operation in short-circuit protected network max. 8 A.
- May not exceed or fall short of V_S.
- Without load.
- Q = dark-switching.
- Q = light-switching.
- Signal transit time with resistive load.
- Wave length: 650 nm
- Light spot size (distance): Ø 1 mm (500 mm)
- Sensitivity adjustment: Single teach-in button and teach-in via cable 2 (depending on type)
- Sensing range max.: 0 m ... 4.5 m
- Sensing range: 0 m ... 2 m
- Mounting hole: M3
- Type of light: Visible red light
- Light source: Laser
- Switching frequency: 1,000 Hz
- Connection type: Cable with connector, M8, 4-pin, 120 mm, PVC
- Connection type: Cable, 4-wire, 2 m, PVC
- Circuit protection: A 6, B 10, C 11
- Protection class: A 6, B 10, C 11
- Weight: Cable with connector, MB, 4-pin: 20 g, Cable, 4-pin: 45 g, Connector, 4-wire: 10 g
- Device filter: ✓ (COM2) (depending on type)
Miniature photoelectric sensors

Parameter values are subject to change without notice.

Operating reserve

Connection diagram

WL4SLG-3x1x4 Cable
WL4SLG-3x1x2 Cable
WL4SLG-3x3x2x4 (Cable with) connector
WL4SLG-3x3x2x2 (Cable with) connector

Center of optical axis
Threaded mounting hole M3
Connection
Status indicator LED: green: power on
Status indicator LED: yellow: Status of received light beam
Single teach in button

WL4SLGC-3P2232 Connector

Center of optical axis
Threaded mounting hole M3
Connection
Status indicator LED: green: power on
Status indicator LED: yellow: Status of received light beam
Single teach in button

Reflector type
WL4SLG-3x1x2x4 / WL4SLG-3x3x2x4
WL4SLG-3x3x2x2
WL4SLG-3x3x2x2 (Cable with) connector

Sensing range

Light spot size

Overview

Dimensions in mm (inch)

Sensing range
Vertical
Horizontal

0.5 m (1.66 feet) < 1.0
< 1.0

10
0.63

1.0
1.0

2 m (6.6 feet) 1.6
1.6

4.5 m (14.76 feet) < 5.6
< 5.6

Distance in m (feet)

Radius in mm (inch)

0.5
0.5

1.0
1.0

Vertical

Horizontal
Miniature photoelectric sensors

WSE4SL-3

Product description
The WSE4SL-3 through-beam photoelectric switch reliably detects objects even at long distances of up to 60 m. The switch’s precise, highly visible laser light spot has a sharp contour, enabling highly accurate switching and facilitating alignment. The sensor’s high precision also makes it suitable for applications requiring the laser beam to be guided through small openings or holes.

At a glance
- Precise laser light spot, laser class 1
- Long-range detection up to 60 m
- Established and proven housing design
- High-quality sensor manufacturing and testing for mechanical ruggedness
- Choice of adjustment via teach-in button, 5-turn potentiometer, or cable

Your benefits
- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- Long sensing range allows use up to 60 m
- Sender-receiver system ensures high reliability
- Established and proven housing design for easy installation

Additional Information
- Detailed technical data: 27
- Ordering information: 26
- Dimensional drawings: 26
- Connection diagram: 29
- Operating reserve: 29
- Sensing range: 29
- Light spot size: 30

For more information, just enter the link or scan the QR code and get direct access to technical data, 3D design models, operating instructions, software, application examples and much more.
**Miniature photoelectric sensors**

**WSE4SL-3**

### Detailed technical data

#### Features

- **Sensor principle**: Through-beam photoelectric sensor
- **Dimensions (W x H x D)**: 12.2 mm x 41.8 mm x 17.3 mm
- **Housing design (light emission)**: Rectangular / Slim
- **Mounting hole**: M3
- **Sensing range max.**: 0 m ... 60 m
- **Sensing range**: 0 m ... 50 m
- **Type of light**: Visible red light
- **Light source**: Laser
- **Wave length**: 650 nm
- **Light spot size (distance)**: Ø 1 mm (500 mm)
- **Sensitivity adjustment**: Single teach-in button

**Mechanics/electronics**

- **Supply voltage**: 10 V DC ... 30 V DC
- **Residual ripple**: ≤ 5 Vpp
- **Power consumption**: ≤ 30 mA
- **Switching output**: PNP: light/dark-switching, complementary
  - NPN: light/dark-switching, complementary (depending on type)
- **Output current**: ≤ 100 mA
- **Response time**: ≤ 0.5 ms
- **Switching frequency**: 1,000 Hz
- **Connection type**: Cable, 2 m, PVC, 0.14 mm²
- **Circuit protection**: A, B, C (depending on type)
- **Protection class**: A
- **Weight**: 90 g (Cable, M8, 4-pin), 20 g (Connector, 4-wire)
- **Housing material**: Bayblend Plastic
- **Optics material**: PMMA
- **Enclosure rating**: IP 66

### Ambient operating temperature

- **Temperature range**: -30 °C ... +60 °C
- **Temperature range extended**: -30 °C ... +55 °C
- **Ambient storage temperature**: -30 °C ... +70 °C

**Ambient operating temperature**

- Limit values, operation in short-circuit protected network max. 8 A
- May not exceed or fall short of V<sub>S</sub>
- Without load
- Q = light switching
- Signal transit time with resistive load
- With light/dark ratio 1:1
- Do not bend below 0 °C
- A = VS connections reverse-polarity protected
- B = inputs and output reverse-polarity protected
- C = interference suppression
- Order of 6 °C, a max. supply voltage V<sub>max</sub> = 24 V and a max. load current I<sub>max</sub> = 50 mA is permitted
- Using the sensor below T<sub>a</sub> = -10 °C is possible, if the sensor is turned on at T<sub>a</sub> > -10 °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below T<sub>a</sub> = -10 °C.

### Ordering information

<table>
<thead>
<tr>
<th>Sensing range max.</th>
<th>Output function</th>
<th>Connection</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 m ... 60 m</td>
<td>PNP</td>
<td>Connector M8, 4-pin</td>
<td>WSE4SL-3P2237</td>
<td>1058249</td>
</tr>
<tr>
<td></td>
<td>NPN</td>
<td>Cable, 4-wire, 2 m, PVC</td>
<td>WSE4SL-3N1137</td>
<td>1058250</td>
</tr>
</tbody>
</table>

### Dimensional drawings

- Center of optical axis
- Threaded mounting hole M3
- Connection
- Status indicator LED green: power on
- Status indicator LED, yellow: Status of received light beam
- Single teach-in button
## Miniature photoelectric sensors

**WSE4SL-3**

## Accessories

**WSE4SL-3**

### W4SL-3

**Mounting brackets/plates**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Accessory type</th>
<th>Material</th>
<th>Model name</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Mounting brackets" /></td>
<td>Mounting brackets</td>
<td>Stainless steel 1.4571</td>
<td>8EF/W4-A</td>
<td>2051628</td>
</tr>
<tr>
<td><img src="image" alt="Mounting brackets" /></td>
<td>Mounting brackets</td>
<td>Stainless steel 1.4571</td>
<td>8EF/W4-B</td>
<td>2051630</td>
</tr>
</tbody>
</table>

Subject to change without notice

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Accessories

WSE4SL-3

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8015616/2012-12-17

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## Accessories

### Terminal and alignment brackets

- **Accessory type:** Universal terminal systems

<table>
<thead>
<tr>
<th>Figure</th>
<th>Material</th>
<th>Model no.</th>
<th>Part no.</th>
<th>WSE4SL-3</th>
<th>WSE4SL-3</th>
<th>WSE4SL-3</th>
<th>WSE4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Steel, zinc coated</td>
<td>BEF-KHS-H01</td>
<td>2022465</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td></td>
<td>Zinc diecast</td>
<td>BEF-KHS-H02</td>
<td>5322626</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td></td>
<td>Zinc plated steel (sheet), Diecast zinc (clamp)</td>
<td>BEF-KHS-H03</td>
<td>2051608</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
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<tr>
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<td>Steel, zinc coated</td>
<td>BEF-KHS-H04</td>
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<tr>
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<td>Steel, zinc coated</td>
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<td>2051610</td>
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<td>● ● ● ●</td>
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<tr>
<td></td>
<td>Aluminium</td>
<td>BEF-M3S-D12</td>
<td>5321878</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
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### Reflectors

<table>
<thead>
<tr>
<th>Figure</th>
<th>Accessory type</th>
<th>Dimensions (L x W)</th>
<th>Material</th>
<th>Model name</th>
<th>Part no.</th>
<th>WSE4SL-3</th>
<th>WSE4SL-3</th>
<th>WSE4SL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>47 mm x 47 mm</td>
<td>PMMA/ABS</td>
<td>P250F</td>
<td>5308843</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø 23 mm</td>
<td>PMMA/ABS</td>
<td>P25F.1</td>
<td>5319385</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 mm x 23 mm</td>
<td>PMMA/ABS</td>
<td>P41F</td>
<td>5315128</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 mm x 18 mm</td>
<td>PMMA/ABS</td>
<td>PL10F</td>
<td>5311210</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 mm x 38 mm</td>
<td>PMMA/ABS</td>
<td>PL20F</td>
<td>5308844</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 mm x 56 mm</td>
<td>PMMA/ABS</td>
<td>PL30F</td>
<td>5326523</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
<tr>
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<td></td>
<td>45 mm x 76 mm</td>
<td>PMMA/ABS</td>
<td>PL81-1F</td>
<td>5325060</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
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<tr>
<td></td>
<td></td>
<td>80 mm x 80 mm</td>
<td>PMMA/ABS</td>
<td>PL80A</td>
<td>1003865</td>
<td>● - -</td>
<td>● - -</td>
<td>● - -</td>
</tr>
</tbody>
</table>
**Accessories**

### Dimensional drawings Mounting brackets/plates

- **BEF-W4-A**
- **BEF-W4-B**

### Dimensional drawings Terminal and alignment brackets

- **BEF-KHS-H01**
- **BEF-KHS-K03**

**Plug connectors and cables**

- **Connector type:** Female connector
- **Enclosure rating:** IP 67

#### Configuration

**Connector M8, 4-pin**
- **Straight**
  - PVC, 2 m: DEI-080-402M, Part no. 6009870
  - PVC, 5 m: DEI-080-405M, Part no. 6009872
- **Angled**
  - PVC, 2 m: DEI-080-402M, Part no. 6009871
  - PVC, 5 m: DEI-080-405M, Part no. 6009873

**Connector M12, 4-pin**
- **Straight**
  - PVC, 2 m: DEI-120-402M, Part no. 6009862
  - PVC, 5 m: DEI-120-405M, Part no. 6009866
- **Angled**
  - PVC, 2 m: DEI-120-402M, Part no. 6009833
  - PVC, 5 m: DEI-120-405M, Part no. 6009867

**Connector M8, 4-pin**
- **Straight**
  - -: DEI-080-404-G, Part no. 6009974
- **Angled**
  - -: DEI-080-4-W, Part no. 6009975

**Connector M12, 4-pin**
- **Straight**
  - PBT: DEI-120-404-G, Part no. 6007302
- **Angled**
  - PBT: DEI-120-4-W, Part no. 6007303

---

**Dimensions**

- Mounting brackets/plates:
  - BEF-W4-A
  - BEF-W4-B

- Terminal and alignment brackets:
  - BEF-KHS-H01
  - BEF-KHS-K03

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  - Italien
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  - Mexiko
  - Nederland
  - Norge
  - Österreich
  - Polen
  - România
  - Russland
  - Schweiz
  - Singapur
  - Slowenien
  - Südafrika
  - Südkorea
  - Schweden
  - Taiwan
  - Türkiet
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