# WSE16I-24162100A00

## W16

**SMALL PHOTOELECTRIC SENSORS**

**SICK**
Sensor Intelligence.

Illustration may differ

## Ordering information

| Type | Part no. |
|---|---|
| WSE16I-24162100A00 | 1088326 |

Other models and accessories ➜ www.sick.com/W16

## Detailed technical data

### Features

| | |
|---|---|
| Sensor/ detection principle | Through-beam photoelectric sensor |
| Dimensions (W x H x D) | 20 mm x 55.7 mm x 42 mm |
| Housing design (light emission) | Rectangular |
| Sensing range max. | 0 m ... 45 m |
| Type of light | Infrared light |
| Light source | LED [1] |
| Light spot size (distance) | Ø 110 mm (8 m) |
| Wave length | 850 nm |
| Adjustment | BluePilot: With alignment aid<br>IO-Link |
| Pin 2 configuration | External input, Teach-in, switching signal |

[1] Average service life: 100,000 h at $T_U$ = +25 °C.

## Mechanics/electronics

| | |
|---|---|
| **Supply voltage** | 10 V DC … 30 V DC [1] |
| **Ripple** | ≤ 5 $V_{pp}$ |
| **Power consumption, sender** | ≤ 30 mA [2]<br>< 50 mA [3] |
| **Power consumption, receiver** | ≤ 30 mA [2]<br>< 50 mA [3] |
| **Switching output** | PUSH/PULL<br>PNP<br>NPN |
| **Output: $Q_{L1}$ / C** | Switching output or IO-Link mode |
| **Output function** | Factory setting: Pin 2 (MF): NPN normally closed (light switching), PNP normally open (dark switching), Pin 4 (QL1/C): NPN normally open (dark switching), PNP normally closed (light switching), IO-Link |
| **Switching mode** | Light/dark switching |
| **Signal voltage PNP HIGH/LOW** | Approx. $V_S$ – 2.5 V / 0 V |
| **Signal voltage NPN HIGH/LOW** | Approx. VS / < 2.5 V |
| **Output current $I_{max.}$** | ≤ 100 mA |
| **Response time** | ≤ 500 µs [4] |
| **Switching frequency** | 1,000 Hz [5] |
| **Connection type** | Male connector M12, 4-pin |
| **Circuit protection** | A [6]<br>B [7]<br>C [8]<br>D [9] |
| **Protection class** | III |
| **Weight** | 100 g |
| **IO-Link** | ✓ |
| **Housing material** | Plastic, VISTAL® |
| **Optics material** | Plastic, PMMA |
| **Enclosure rating** | IP66<br>IP67<br>IP69K |
| **Test input sender off** | Test at 0 V |
| **Ambient operating temperature** | –40 °C … +60 °C |
| **Ambient storage temperature** | –40 °C … +75 °C |
| **MTTFd: mean time to dangerous failure** | 539 years |

[1] Limit values.

[2] 16 V DC … 30 V DC, without load.

[3] 10 V DC … 16 V DC, without load.

[4] Signal transit time with resistive load in switching mode. Different values possible in COM2 mode.

[5] With light/dark ratio 1:1 in switching mode. Different values possible in IO-Link mode.

[6] A = $V_S$ connections reverse-polarity protected.

[7] B = inputs and output reverse-polarity protected.

[8] C = interference suppression.

[9] D = outputs overcurrent and short-circuit protected.

| UL File No. | NRKH.E181493 & NRKH7.E181493 |
|---|---|

[1] Limit values.

[2] 16 V DC ... 30 V DC, without load.

[3] 10 V DC ... 16 V DC, without load.

[4] Signal transit time with resistive load in switching mode. Different values possible in COM2 mode.

[5] With light/dark ratio 1:1 in switching mode. Different values possible in IO-Link mode.

[6] A = $V_S$ connections reverse-polarity protected.

[7] B = inputs and output reverse-polarity protected.

[8] C = interference suppression.

[9] D = outputs overcurrent and short-circuit protected.

## Classifications

| | |
|---|---|
| ECl@ss 5.0 | 27270904 |
| ECl@ss 5.1.4 | 27270904 |
| ECl@ss 6.0 | 27270904 |
| ECl@ss 6.2 | 27270904 |
| ECl@ss 7.0 | 27270904 |
| ECl@ss 8.0 | 27270904 |
| ECl@ss 8.1 | 27270904 |
| ECl@ss 9.0 | 27270904 |
| ETIM 5.0 | EC002719 |
| ETIM 6.0 | EC002719 |
| UNSPSC 16.0901 | 39121528 |

## Smart Task

| | |
|---|---|
| Smart Task name | Base logics |
| Logic function | Direct<br>AND<br>OR<br>Window<br>Hysteresis |
| Timer function | Deactivated<br>On delay<br>Off delay<br>ON and OFF delay<br>Impulse (one shot) |
| Inverter | Yes |
| Switching frequency | SIO Direct: 1000 Hz [1]<br>SIO Logic: 800 Hz [2]<br>IOL: 650 Hz [3] |
| Response time | SIO Direct: 500 µs [1]<br>SIO Logic: 600  µs [2]<br>IOL: 750 µs [3] |
| Repeatability | SIO Direct: 150 µs [1]<br>SIO Logic: 300 µs [2]<br>IOL: 400 µs [3] |

[1] SIO Direct: sensor operation in standard I/O mode without IO-Link communication and without using internal sensor logic or time parameters (set to "direct"/"deactivated").

[2] SIO Logic: Sensor operation in standard I/O mode without IO-Link communication. Sensor-internal logic or timing parameters plus Automation Functions used.

[3] IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

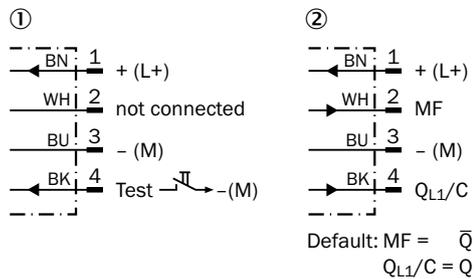| Switching signal $Q_{L1}$ | Switching output |
|---|---|
| Switching signal $Q_{L2}$ | Switching output |

[1] SIO Direct: sensor operation in standard I/O mode without IO-Link communication and without using internal sensor logic or time parameters (set to "direct"/"deactivated").

[2] SIO Logic: Sensor operation in standard I/O mode without IO-Link communication. Sensor-internal logic or timing parameters plus Automation Functions used.

[3] IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

## Communication interface

| Communication interface | IO-Link V1.1 |
|---|---|
| Communication Interface detail | COM2 (38,4 kBaud) |
| Cycle time | 2.3 ms |
| Process data length | 16 Bit |
| Process data structure | Bit 0 = switching signal $Q_{L1}$<br>Bit 1 = switching signal $Q_{L2}$<br>Bit 2 ... 15 = empty |
| VendorID | 26 |
| DeviceID HEX | 0x800174 |
| DeviceID DEZ | 8388980 |

## Connection diagram

Cd-392

① 

| BN | 1 | + (L+) |
| WH | 2 | not connected |
| BU | 3 | – (M) |
| BK | 4 | Test ⟶ –(M) |

② 

| BN | 1 | + (L+) |
| WH | 2 | MF |
| BU | 3 | – (M) |
| BK | 4 | $Q_{L1}$/C |

Default: MF = $\overline{Q}$
$Q_{L1}$/C = Q

① Sender
② Receiver

## Characteristic curve

WSE16P-xxxxx1xx, WSE16I-xxxxx1xx

Function reserve

**WSE16P-xxxxx1xx, WSE16I-xxxxx1xx**

Distance in m (feet)
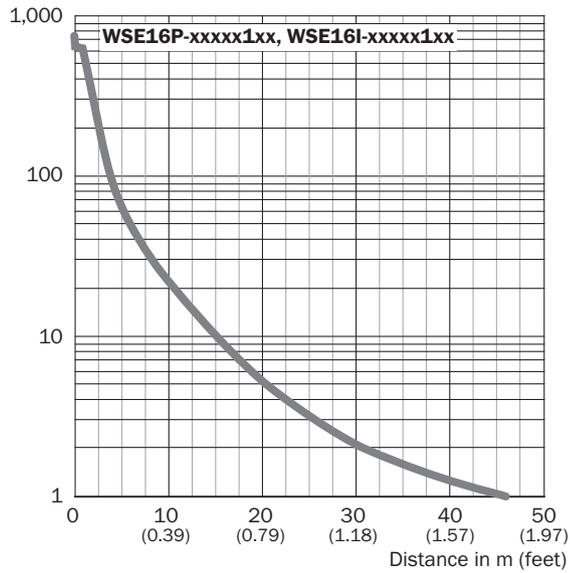
## Light spot size

Infrared light

Radius in mm (inch)

Distance in m (feet)
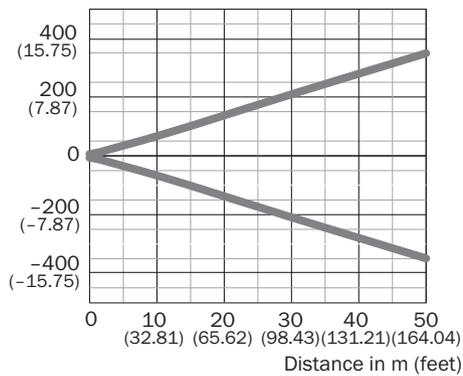
WSE16I-xxxxx1xx
## Sensing range diagram
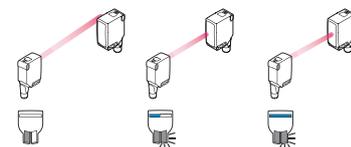
WSE16P-xxxxx1xx, WSE16I-xxxxx1xx

① 0 30 45

Distance in m (feet)
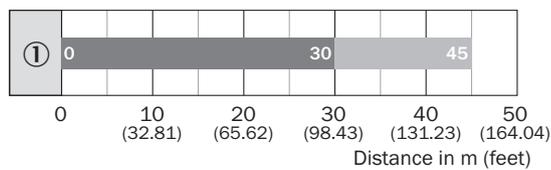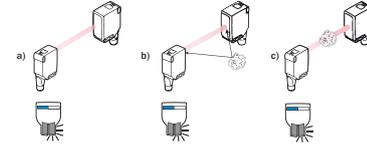
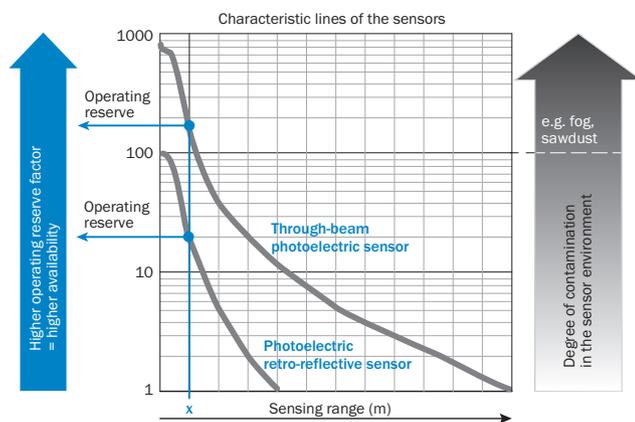█ Sensing range    ░ Sensing range typ. max.

## Functions

### Operation note

**BluePilot: Blue indicator LEDs with double benefits**

| | |
|---|---|
| Easy and quick sensor alignment with the help of the LED indicator<br><br>All blue LEDs illuminate<br>– optimum alignment<br>– highest possible operating reserve | **WSE through-beam photoelectric sensor alignment** |
| **Service note**<br>A reduction in sensor availability is displayed by a decrease of the blue LEDs.<br><br>Possible causes:<br>a) insufficient alignment<br>b) contamination of the optical surfaces<br>c) particles in the light beam | a) b) c) |

### Operation note



At a sensing range of „**x**" the photoelectric retro-reflective and through-beam photoelectric sensors have different operating reserves (see blue arrow). The higher the operating reserve factor, the better the sensor can compensate the contamination in the air or in the light beam and on the optical surfaces (front screen, reflector), i.e. the sensor has the maximum availablity, otherwise the sensor switches due to pollution although there is no object in the path of the light beam.

## Dimensional drawing (Dimensions in mm (inch))

WSE16, connector
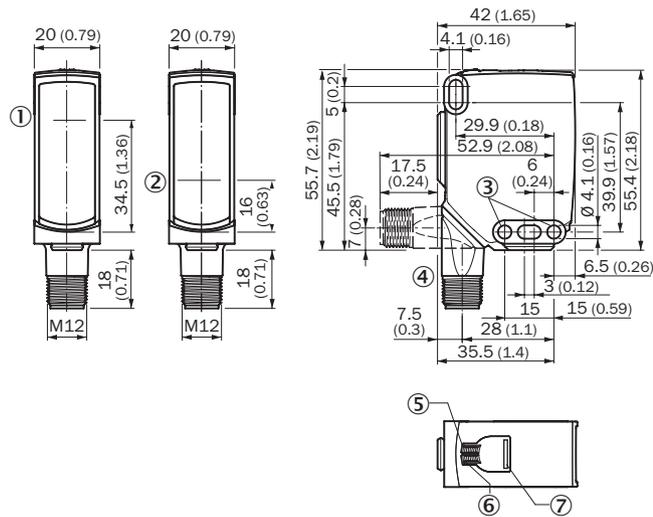
① Center of optical axis, sender
② Center of optical axis, receiver
③ Mounting hole, Ø 4.1 mm
④ Connection
⑤ LED indicator green: power
⑥ LED indicator yellow: Status of received light beam
⑦ BluePilot blue: Alignment aid

## Recommended accessories

Other models and accessories ➜ www.sick.com/W16

| Brief description | Type | Part no. |
|---|---|---|
| **Universal bar clamp systems** | | |
| Plate N02 for universal clamp bracket, Zinc plated steel (sheet), Zinc die cast (clamping bracket), Universal clamp (5322626), mounting hardware | BEF-KHS-N02 | 2051608 |
| Bar clamp for bar diameter of 12 mm (fixing the mounting rod), Aluminum, 2 screws M6 x 30, 2 spring discs | BEF-RMC-D12 | 5321878 |
| **Device protection (mechanical)** | | |
| Protective housing for universal clamp, Zinc plated steel (protective housing), Zinc die cast (clamping bracket), Universal clamp, mounting hardware | BEF-SG-W16 | 2096146 |
| **Mounting brackets and plates** | | |
| Mounting bracket with articulated arm, steel, zinc coated, mounting hardware included | BEF-WN-MULTI2 | 2093945 |

| | Brief description | Type | Part no. |
|---|---|---|---|
| **Adapters and distributors** | | | |
| | Y-Junction, 2 x female connector M12, 4-pin, straight, 0.11 m PVC-cable, 1 x male connector M12, 4-pin, straight, to connect SICK Sensors with SICK Smart Sensors | SYL-1204-G0M11-X1 | 6055011 |
| **Plug connectors and cables** | | | |
| | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m | YF2A14-020UB3XLEAX | 2095607 |
| | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PVC, unshielded, 2 m | YF2A14-020VB3XLEAX | 2096234 |
| | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m | YF2A14-050UB3XLEAX | 2095608 |
| | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PVC, unshielded, 5 m | YF2A14-050VB3XLEAX | 2096235 |
| | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PVC, unshielded, 2 m | YG2A14-020VB3XLEAX | 2095895 |
| | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PVC, unshielded, 5 m | YG2A14-050VB3XLEAX | 2095897 |
| | Head A: female connector, M12, 4-pin, straight<br>Head B: -<br>Cable: unshielded | DOS-1204-G | 6007302 |
| | | DOS-1204-GQU6 | 6042088 |
| | Head A: female connector, M12, 4-pin, angled<br>Head B: -<br>Cable: unshielded | DOS-1204-W | 6007303 |
| | Head A: male connector, M12, 4-pin, straight<br>Head B: -<br>Cable: unshielded | STE-1204-G | 6009932 |

# SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is "Sensor Intelligence."**

# WORLDWIDE PRESENCE:

Contacts and other locations –**www.sick.com**

SICK AG  |  Waldkirch  |  Germany  |  www.sick.com

**SICK**
Sensor Intelligence.