



DATA SHEET

# WSE4SP-32161100A00

W4  
Photoelectric sensors

## PHOTOELECTRIC SENSORS

## WSE4SP-32161100A00

## ORDERING INFORMATION

Type	part no.
WSE4SP-32161100A00	1140395

Further device versions and accessories at [www.sick.com/W4](http://www.sick.com/W4)



Illustration may differ



## DETAILED TECHNICAL DATA

## FEATURES

Functional principle	Through-beam photoelectric sensor	
Sensing range		
	Sensing range min.	0 m
	Sensing range max.	12 m
	Maximum distance range from receiver to sender (operating reserve 1)	0 m ... 12 m
	Recommended distance range from receiver to sender (operating reserve 2)	0 m ... 9 m
	Recommended sensing range for the best performance	0 m ... 9 m
Emitted beam		
	Light source	PinPoint LED
	Type of light	Visible red light
	Shape of light spot	Point-shaped
	Light spot size (distance)	60 mm (2 m)
	Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T <sub>0</sub> = +23 °C)
Key LED figures		
	Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
	LED risk group marking	Free group
	Wave length	635 nm
	Average service life	100,000 h at T <sub>a</sub> = +25 °C
Adjustment		
	IO-Link	For configuring the sensor parameters and Smart Task functions
Display		
	LED blue	BluePilot: Alignment aid
	LED green	Operating indicator Static on: power on

LED yellow	Flashing: IO-Link mode Status of received light beam Static on: object not present Static off: object present Flashing: Below the 1.5 function reserve
Special applications	Detection of poorly remitting and tilted objects
Part number of individual components	WSO4SP-323ZZ1A0ZZZ, 2139772 WEO4SP-32161100A00, 2140374

**SAFETY-RELATED PARAMETERS**

MTTF <sub>D</sub>	1,219 years
DC <sub>avg</sub>	0%

**COMMUNICATION INTERFACE**

IO-Link	✓, IO-Link V1.1
Data transmission rate	COM2 (38,4 kBaud)
Cycle time	2.3 ms
Process data length	16 Bit
Process data structure	Bit 0 = switching signal Q <sub>L1</sub> Bit 1 = switching signal Q <sub>L2</sub> Bit 2 ... 15 = empty
VendorID	26
DeviceID HEX	0x800351
DeviceID DEC	8389457
Compatible master port type	A
SIO mode support	Yes

**ELECTRONICS**

Supply voltage U <sub>B</sub>	10 V DC ... 30 V DC <sup>1)</sup>
Ripple	≤ 5 V <sub>pp</sub>
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	≤ 20 mA, without load. At U <sub>B</sub> = 24 V
Protection class	III
Digital output	Number 2 Type Push-pull: PNP/NPN Switching mode Dark switching Signal voltage PNP HIGH/LOW Approx. U <sub>B</sub> -2.5 V / 0 V Signal voltage NPN HIGH/LOW Approx. U <sub>B</sub> / < 2.5 V Output current I <sub>max</sub> ≤ 100 mA Circuit protection outputs Reverse polarity protected Overcurrent protected Short-circuit protected Response time ≤ 500 μs Repeatability (response time) 150 μs Switching frequency 1,000 Hz
Pin/Wire assignment, sender	

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

# PHOTOELECTRIC SENSORS - WSE4SP-32161100A00

Function of pin 4/black (BK)	Input, sender off, LOW active
Pin/Wire assignment, receiver	
Function of pin 4/black (BK)	Digital output, dark switching, object present → output $\bar{Q}_L$ HIGH <sup>2)</sup> IO-Link communication C
Function of pin 4/black (BK) – detail	The pin 4 function of the sensor can be configured, Additional possible settings via IO-Link
Function of pin 2/white (WH)	Digital output, light switching, object present → output $Q_L$ LOW
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be configured, Additional possible settings via IO-Link

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

## MECHANICS

Housing	Rectangular
Design detail	Slim
Dimensions (W x H x D)	12.1 mm x 41.9 mm x 18.6 mm
Connection	Cable with M8 male connector, 4-pin, 114 mm
Connection detail	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm <sup>2</sup>
Cable diameter	Ø 3.4 mm
Length of cable (L)	77 mm
Length of male connector	37 mm
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Male connector	Plastic, VISTAL®
Maximum tightening torque of the fixing screws	0.4 Nm

## AMBIENT DATA

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529)
Ambient operating temperature	-40 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +75 °C
Typ. Ambient light immunity	Artificial light: ≤ 15,000 lx Sunlight: ≤ 50,000 lx
Shock resistance	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
Vibration resistance	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
Air humidity	35 % ... 95 %, relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
Resistance to cleaning agent	ECOLAB
UL File No.	NRKH.E181493 & NRKH7.E181493

## SMART TASK

Smart Task name	Base logics
Logic function	Direct AND OR
Timer function	Deactivated Switch-on delay Off delay ON and OFF delay Impulse (one shot)
Inverter	Yes

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

Switching frequency	SIO Logic: 800 Hz <sup>1)</sup>	
Response time	SIO Logic: 600 μs <sup>1)</sup>	
Repeatability	SIO Logic: 200 μs <sup>1)</sup>	
Switching signal	Switching signal Q <sub>L1</sub>	Switching output
	Switching signal $\bar{Q}_{L1}$	Switching output

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

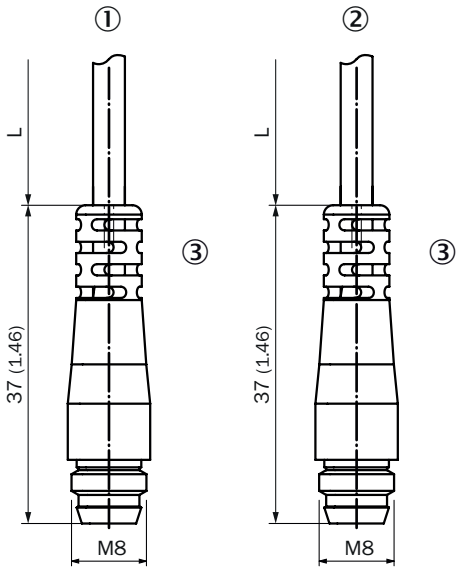
## DIAGNOSIS

Device temperature	Measuring range	Very cold, cold, moderate, warm, hot
Device status		Yes
Detailed device status		Yes
Operating hour counter		Yes
Operating hours counter with reset function		Yes
Quality of teach		Yes
Quality of run		Yes, Contamination display

## CERTIFICATES

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
cULus certificate	✓
Photobiological safety (IEC EN 62471)	✓

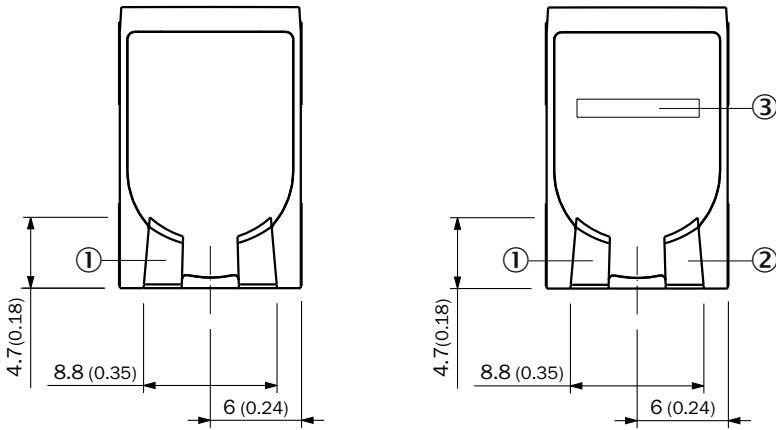
**DIMENSIONAL DRAWING, CONNECTION**



Dimensions in mm (inch)  
For length of cable (L), see technical data

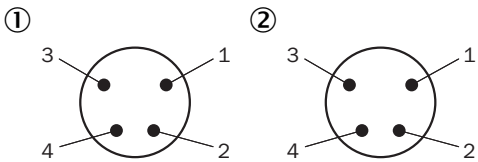
- ① sender
- ② receiver
- ③ cable with connector M8

**DISPLAY AND ADJUSTMENT ELEMENTS**



- ① LED green
- ② LED yellow
- ③ LED blue

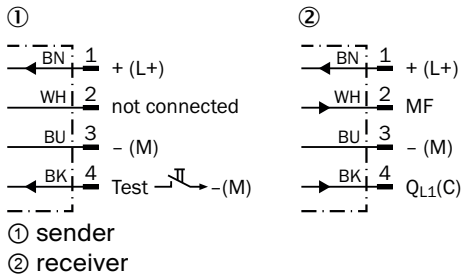
**PINOOTS**



male connector M8, 4-pin

- ① receiver
- ② sender

CONNECTION DIAGRAM CD-516



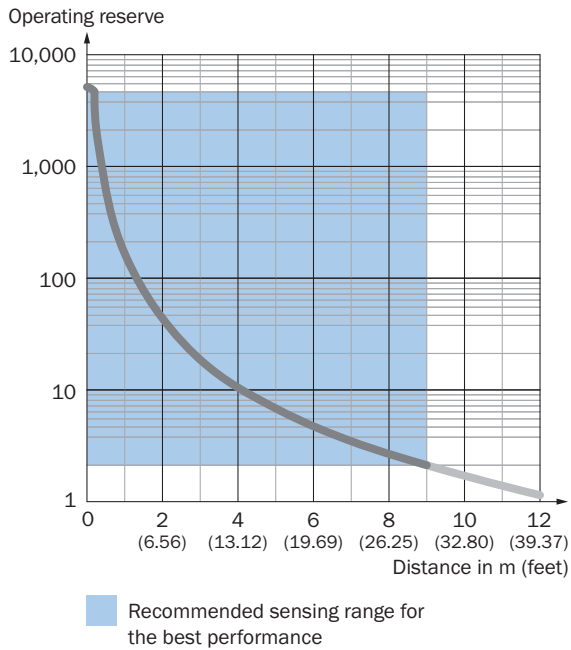
TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING  $\bar{Q}$

	Dark switching $\bar{Q}$ (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	⚡	✗
Load resistance to M	✗	⚡

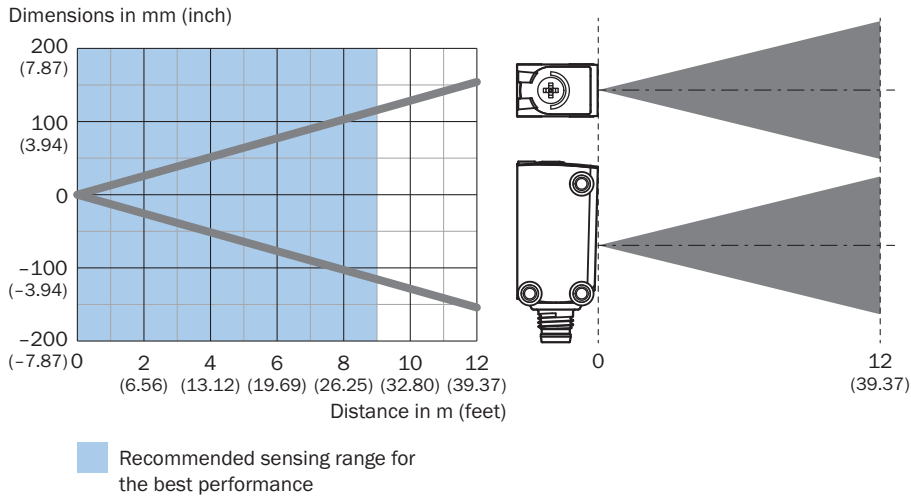
**TRUTH TABLE PUSH-PULL: PNP/NPN - LIGHT SWITCHING Q**

	Light switching Q (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	✗	⚡
Load resistance to M	⚡	✗

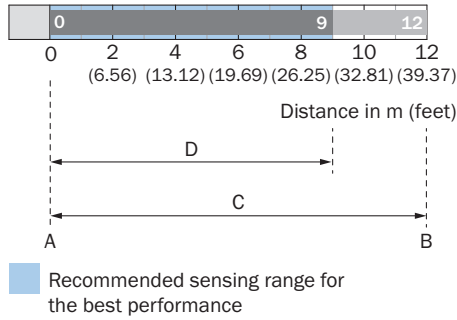
**CHARACTERISTIC CURVE**



**LIGHT SPOT SIZE**

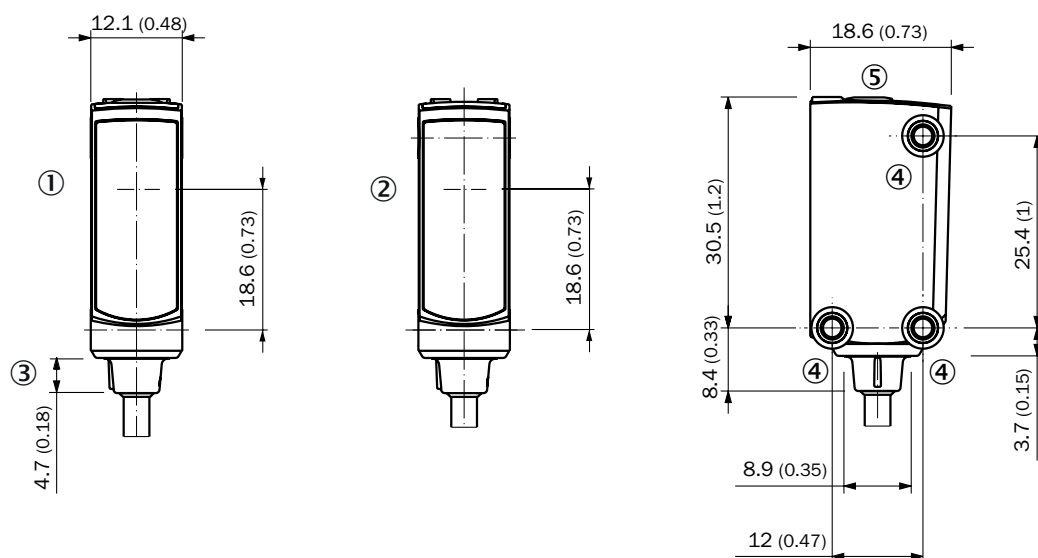


**SENSING RANGE DIAGRAM**



A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from receiver to sender
D	Recommended distance range from receiver to sender

**DIMENSIONAL DRAWING, SENSOR**



Dimensions in mm (inch)

- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Connection
- ④ M3 mounting hole
- ⑤ display and adjustment elements

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at [www.sick.com/1140395](http://www.sick.com/1140395)



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# SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

**SICK**  
Sensor Intelligence