



WSE4SP-32161100A00

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	Part no.
WSE4SP-32161100A00	1140395

Other models and accessories → www.sick.com/W4



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 _a = +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 _a = +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 Flashing: IO-Link mode
	LED yellow	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		WS04SP-323ZZ1A0ZZZ, 2139772 WE04SP-32161100A00, 2140374

Safety-related parameters

MTTF_D	1,219 years
DC_{avg}	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 _{L1} Bit 1 = switching signal Q _{L2} Bit 2 ... 15 = empty
VendorID	26
Compatible master port type	A
SIO mode support	Yes

Electronics

Supply voltage U_B	10 V DC ... 30 V DC ¹⁾
Ripple	≤ 5 V _{pp}
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 _B = 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 _B -2.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. U _B / < 2.5 V
Output current I _{max.}	≤ 100 mA
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Response time	≤ 500 µs
Repeatability (response time)	150 µs
Switching frequency	1,000 Hz
Pin/Wire assignment, sender	
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}_{L1} HIGH ²⁾ 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, dark switching, object present → output \bar{Q}_{L1} HIGH
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be configured, Additional possible settings via IO-Link

¹⁾ Limit values.

²⁾ 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 ²
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	
Switching frequency		SIO Logic: 800 Hz ¹⁾	
Response time		SIO Logic: 600 μs ¹⁾	
Repeatability		SIO Logic: 200 μs ¹⁾	
Switching signal			
	Switching signal Q _{L1}	Switching output	
	Switching signal \bar{Q}_{L1}	Switching output	

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

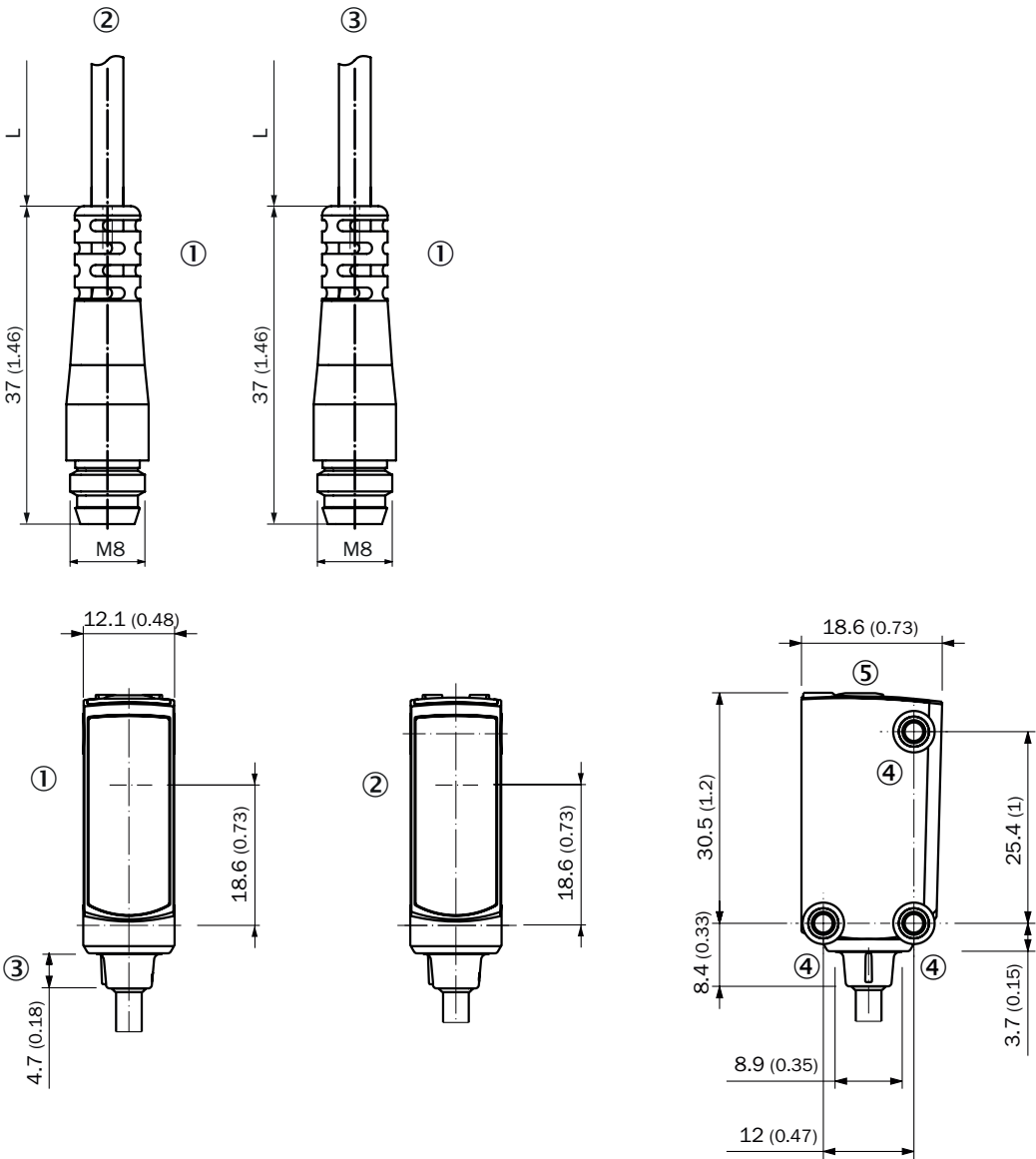
Diagnosis			
Device temperature			
	Measuring range	Very cold, cold, moderate, warm, hot	
Device status		Yes	
Detailed device status		Yes	
Operating hour counter		Yes	
Operating hours counter with reset function		Yes	
Quality of teach		Yes	
Quality of run		Yes, Contamination display	

Classifications			
ECLASS 5.0		27270901	
ECLASS 5.1.4		27270901	
ECLASS 6.0		27270901	
ECLASS 6.2		27270901	
ECLASS 7.0		27270901	
ECLASS 8.0		27270901	
ECLASS 8.1		27270901	
ECLASS 9.0		27270901	
ECLASS 10.0		27270901	
ECLASS 11.0		27270901	
ECLASS 12.0		27270901	
ETIM 5.0		EC002716	
ETIM 6.0		EC002716	
ETIM 7.0		EC002716	

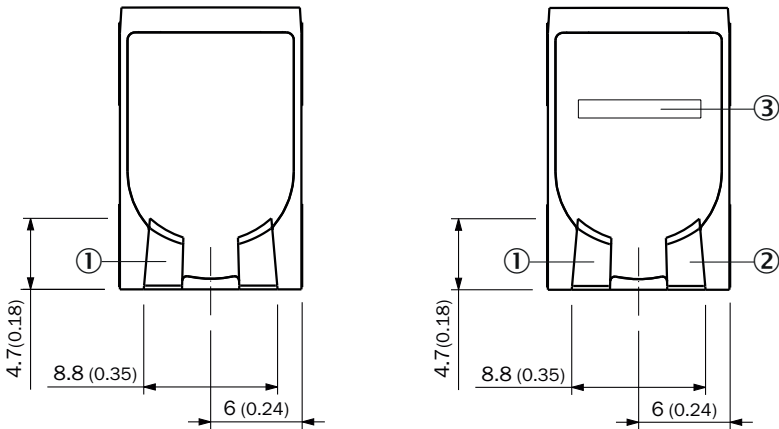
ETIM 8.0	EC002716
UNSPSC 16.0901	39121528

Maßzeichnung (Dimensions in mm (inch))

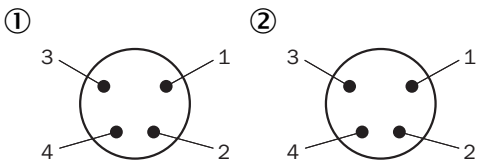
Dimensional drawing (Dimensions in mm (inch))



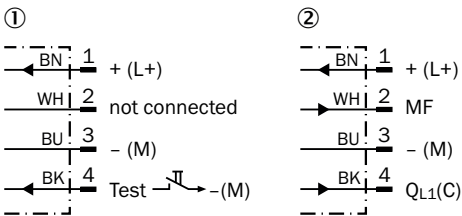
Adjustments



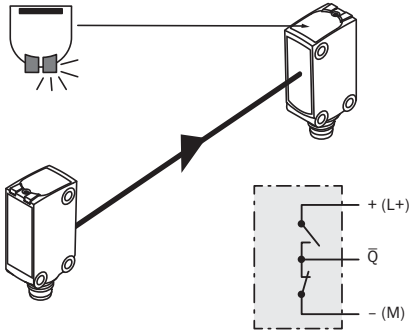
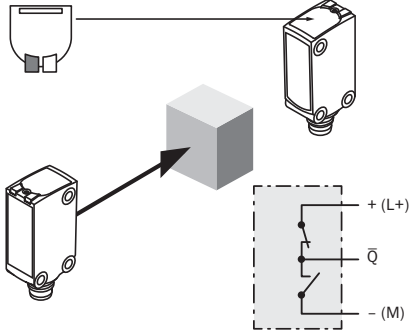
Connection type

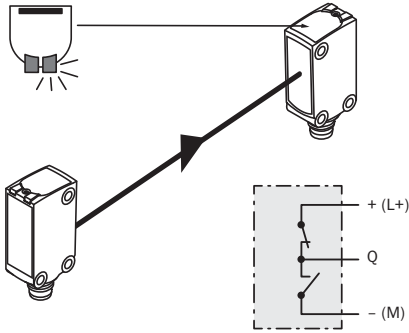
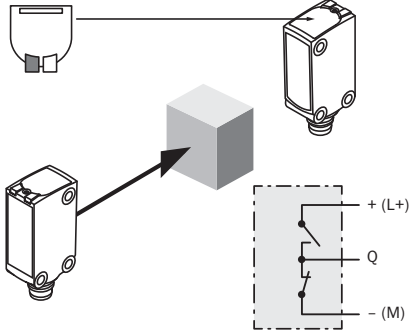


Connection diagram

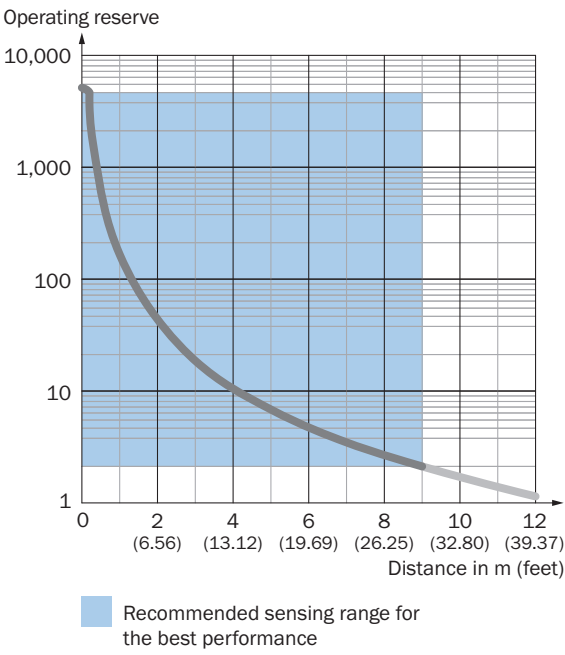


Truth table

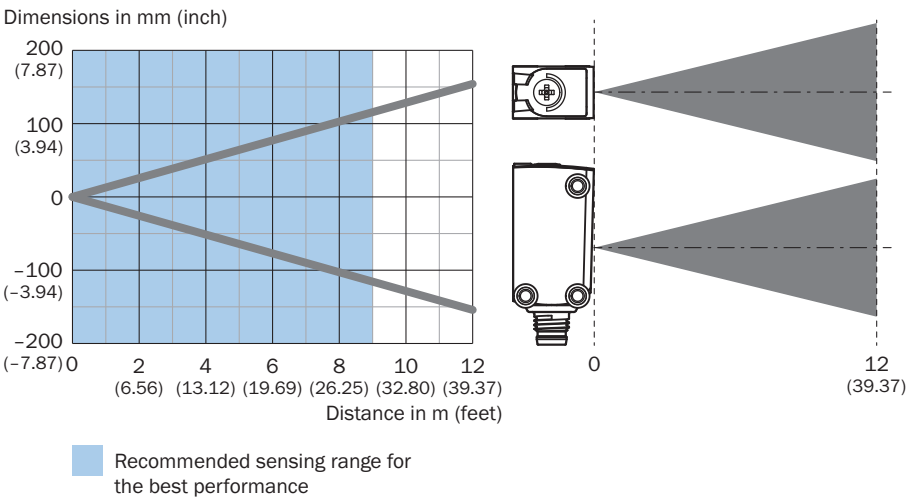
	Dark switching \bar{Q} (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	⚡	✗
Load resistance to M	✗	⚡
		

	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	⚡	✗
		

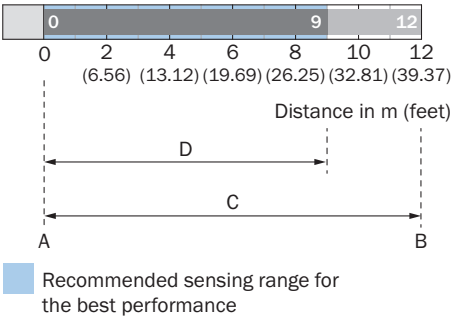
Characteristic curve



Light spot size



Sensing range diagram



SICK AT A GLANCE

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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.

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For us, that is “Sensor Intelligence.”

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