



WSE4SP-22161100A00

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WSE4SP-22161100A00	1140392

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 Ta = +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 $T_a = +25\text{ °C}$
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-223ZZ1A0ZZZ, 2137117 WE04SP-22161100A00, 2140373

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		$\leq 5\text{ V}_{pp}$
Usage category		DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption		$\leq 20\text{ mA}$, without load. At $U_B = 24\text{ V}$
Protection class		III
Digital output		
Number		2
Type		Push-pull: PNP/NPN
Switching mode		Dark switching
Signal voltage PNP HIGH/LOW		Approx. $U_B - 2.5\text{ V}$ / 0 V
Signal voltage NPN HIGH/LOW		Approx. U_B / $< 2.5\text{ V}$
Output current $I_{max.}$		$\leq 100\text{ mA}$

¹⁾ Limit values.

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

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	
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	Male connector M8, 4-pin		
Material	Housing	Plastic, VISTAL®	
	Front screen	Plastic, PMMA	
	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
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¹⁾ Use of Smart Task functions without IO-Link communication (SIO mode).

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).

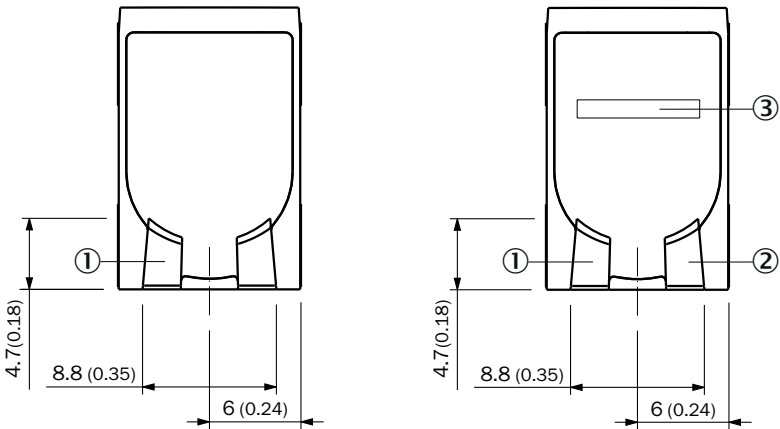
Diagnosis

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

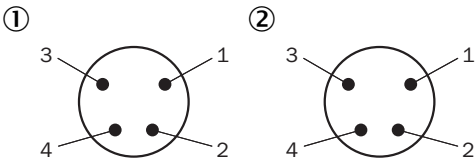
Classifications

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

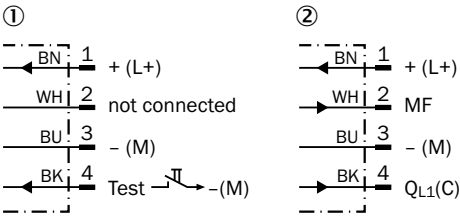
Adjustments



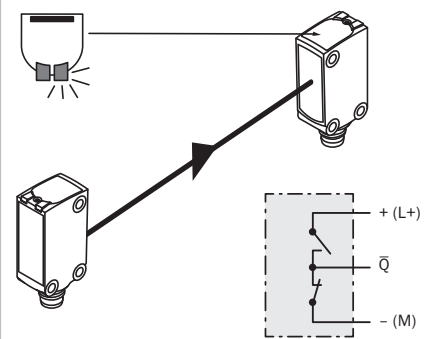
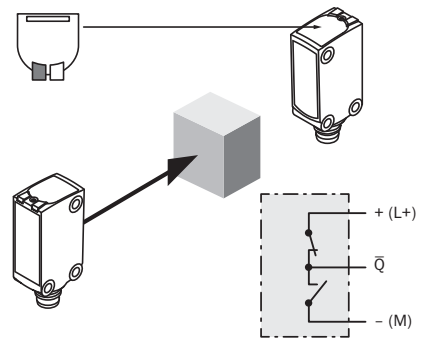
Connection type

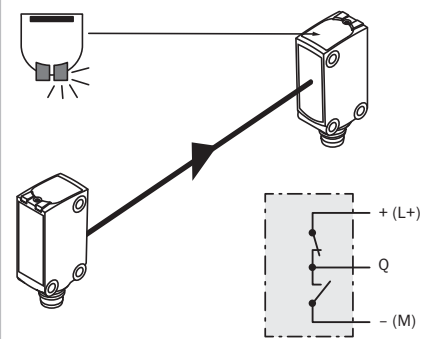
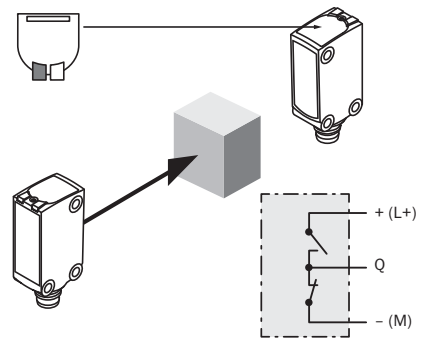


Connection diagram

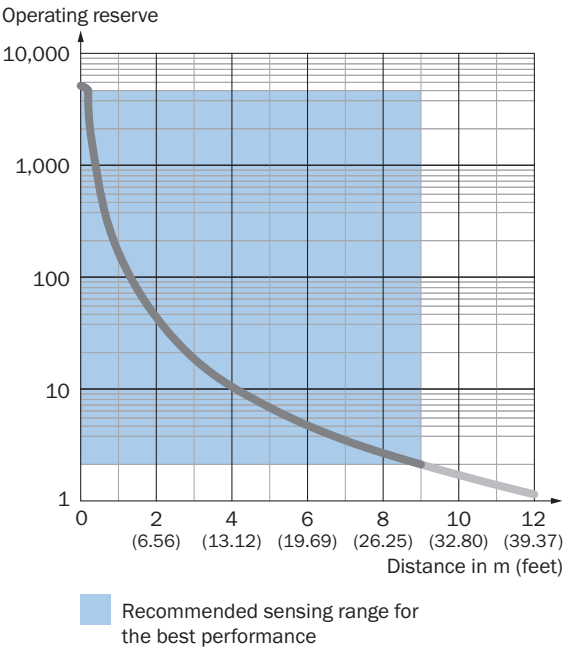


Truth table

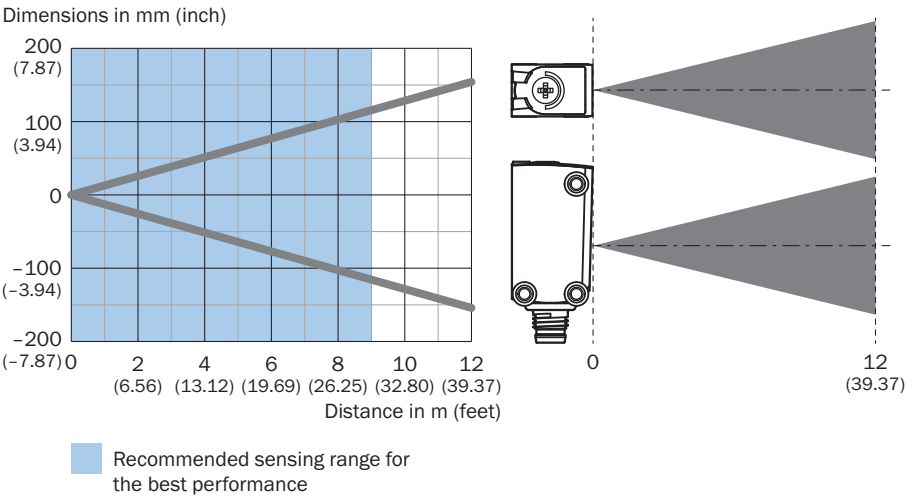
	Dark switching $\bar{Q}$ (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	⚡	✗
Load resistance to M	✗	⚡
		

	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	⚡	✗
		

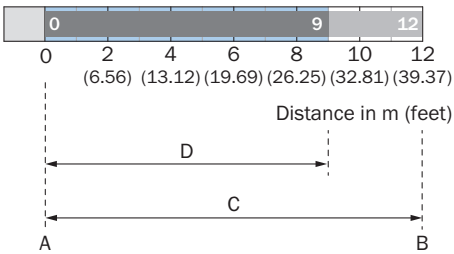
Characteristic curve



Light spot size

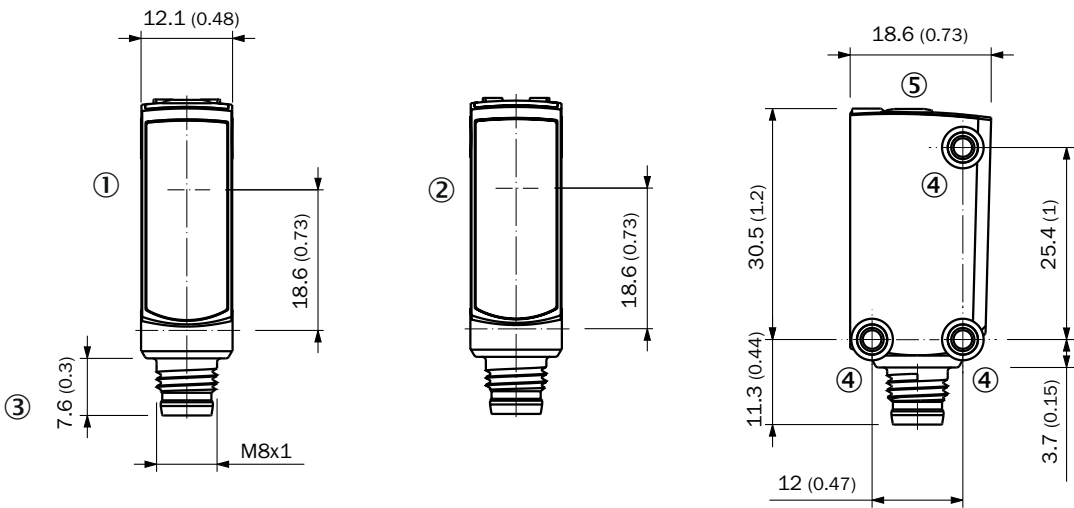


Sensing range diagram



Recommended sensing range for the best performance

Dimensional drawing (Dimensions in mm (inch))



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.”

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