



WSE4SP-8416A100A00

W4

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
WSE4SP-8416A100A00	1140391

Other models and accessories → 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 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 Ta = +25 °C	
Adjustment		
IO-Link	For configuring the sensor parameters and Smart Task functions	
Display		
LED blue	BluePilot: Alignment aid	
LED green	Operating indicatorStatic on: power on/Off: IO-Link mode	
LED yellow	Status of received light beamStatic on: object not presentStatic off: object present/Off: Below the 1.5 function reserve	

Special features	Pin2 pre-setting (MF): not active
Special applications	Detection of poorly remitting and tilted objects
Part number of individual components	WS04SP-843ZZ1A0ZZ, 2139774 WE04SP-8416A100A00, 2140376

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
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
Response time	≤ 500 µs
Repeatability (response time)	150 µs
Switching frequency	1,000 Hz
Pin/Wire assignment, receiver	
Function of pin 4/black (BK)	2)

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 M12 male connector, 4-pin, 190 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)	142 mm
Length of male connector	48 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⁾

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

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

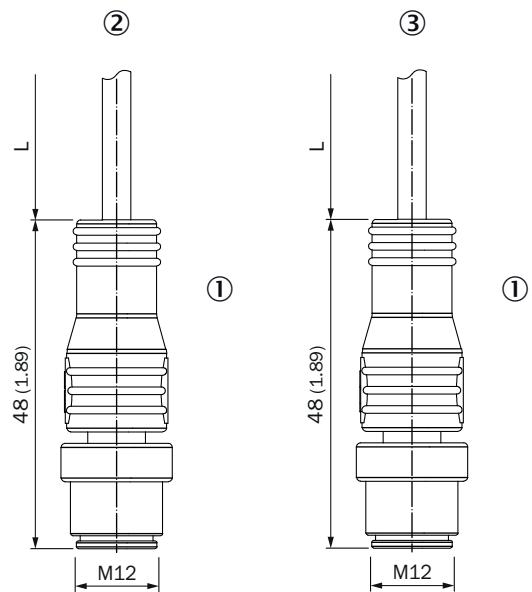
Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓

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

Dimensional drawing, connection



Dimensions in mm (inch)

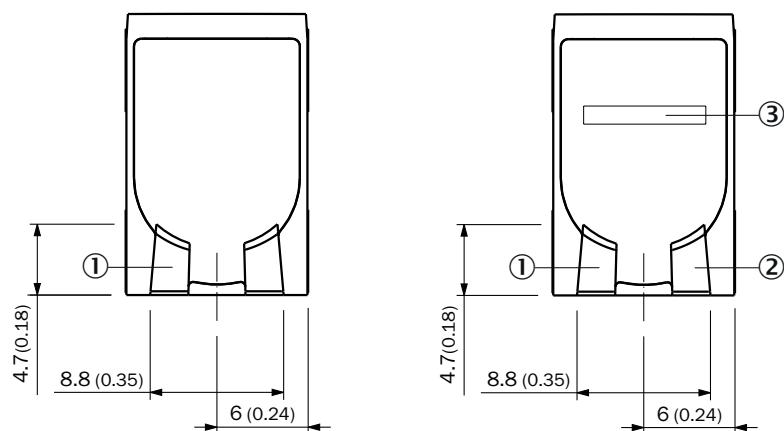
For length of cable (L), see technical data

① Cable with M12 male connector

② sender

③ receiver

display and adjustment elements

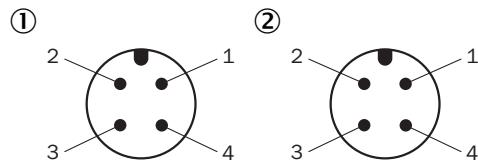


① LED green

② LED yellow

③ LED blue

pinouts

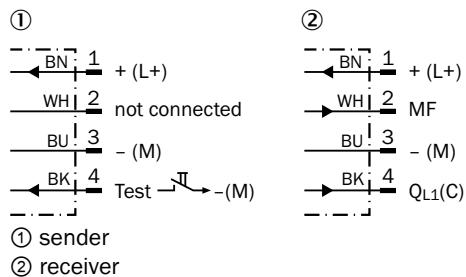


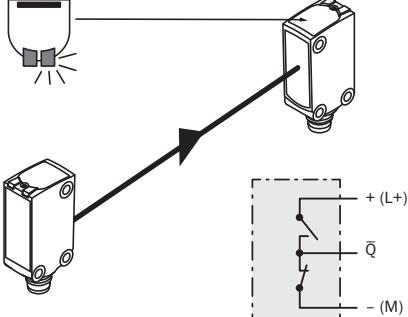
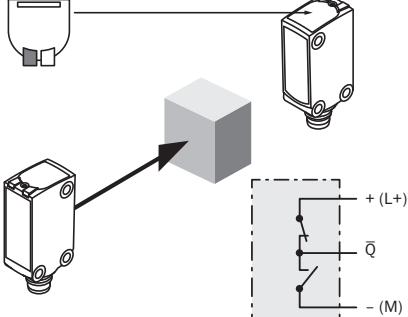
M12 male connector, 4-pin, A-coding

① receiver

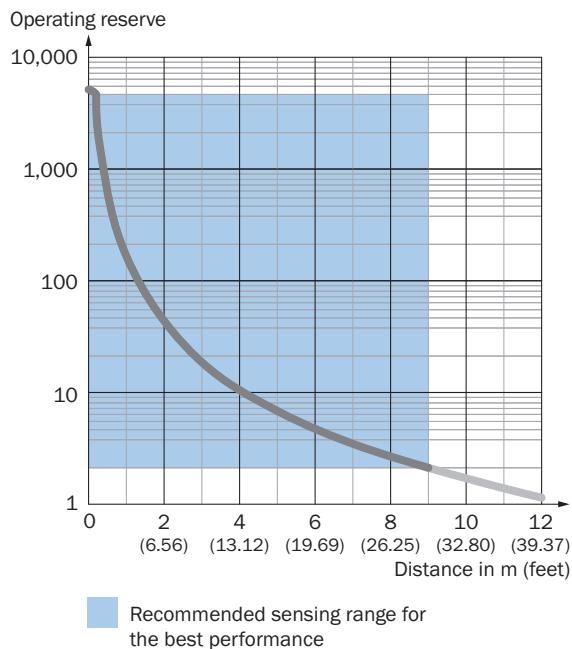
② sender

Connection diagram Cd-516

Truth table Push-pull: PNP/NPN – dark switching \bar{Q}

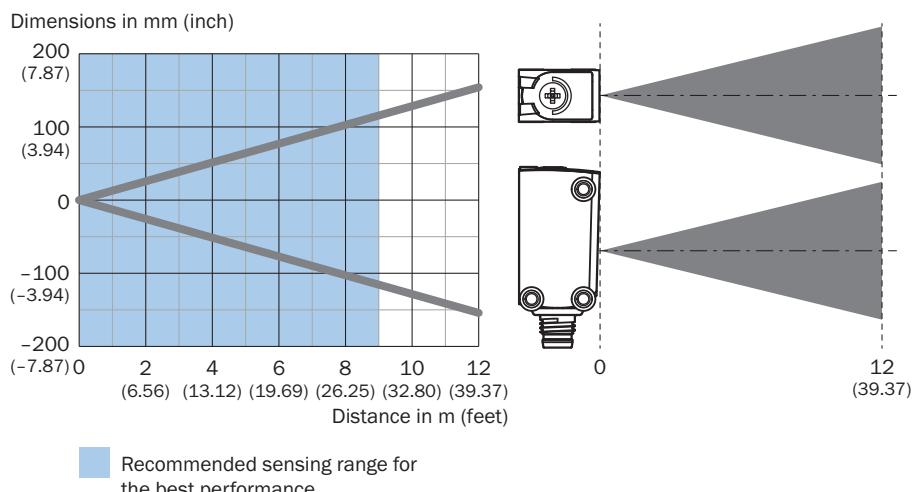
Dark switching \bar{Q} (normally open (upper switch), normally closed (lower switch))		
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	✗	✗
Load resistance to L+	✗	✗
Load resistance to M	✗	✗
		

Characteristic curve



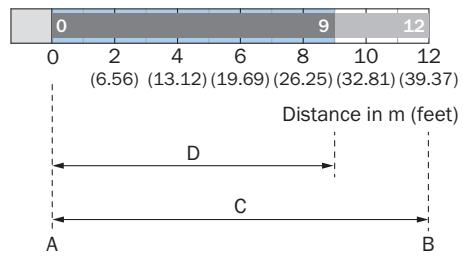
Recommended sensing range for the best performance

Light spot size



Recommended sensing range for the best performance

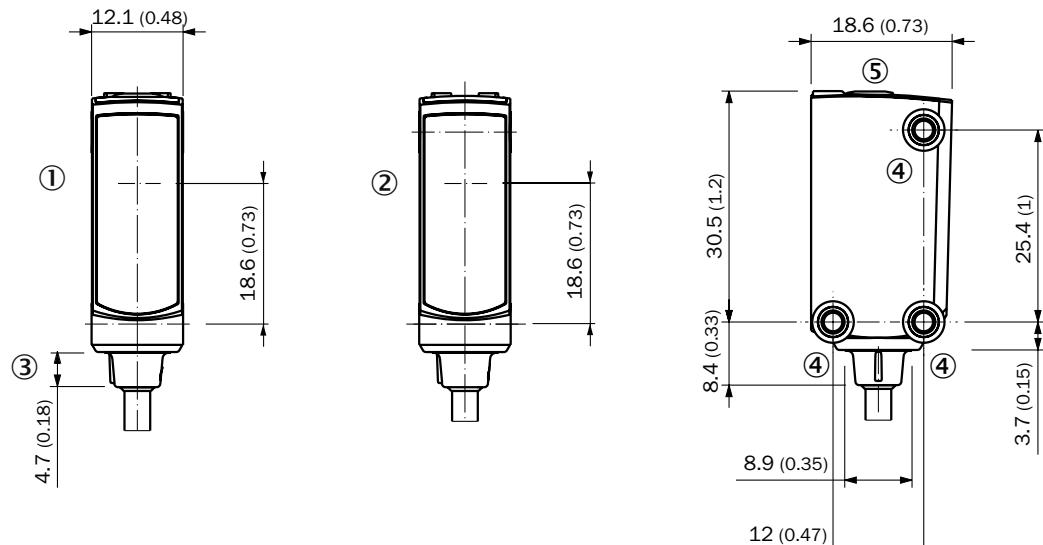
Sensing range diagram



Recommended sensing range for the best performance

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

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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