

WTB4FT-21312120ZZZ

MINIATURE PHOTOELECTRIC SENSORS





Illustration may differ

Ordering information

Туре	Part no.
WTB4FT-21312120ZZZ	1119970

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





Detailed technical data

Features

Functional principle	Photoelectric proximity sensor
Functional principle detail	Background suppression, DoubleLine
Sensing range	
Sensing range min.	7 mm
Sensing range max.	120 mm
Adjustable switching threshold for background suppression	15 mm 120 mm
Reference object	Object with 90% remission factor (complies with standard white according to DIN 5033)
Minimum distance between set sensing range and background (black 6% / white 90%)	1 mm, at a distance of 50 mm
Recommended sensing range for the best per- formance	30 mm 80 mm
Emitted beam	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Line-shaped, two parallel line-shaped light spots
Light spot size (distance)	1.2 mm x 17 mm (50 mm)
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 $T_a = +25 ^{\circ}\text{C}$
Smallest detectable object (MDO) typ.	
	$1~\mathrm{mm}$ (At 50 mm distance (object with 90% remission (complies with standard white according to DIN 5033)))
Adjustment	
Teach-Turn adjustment	BluePilot: For setting the sensing range
Indication	
LED blue	BluePilot: sensing range indicator
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object present Static off: object not present
Special applications	Detecting flat objects, Detecting objects wrapped in film, Detecting perforated objects, Detecting uneven, shiny objects

Safety-related parameters

MTTF _D	661 years
DC _{avg}	0 %
T _M (mission time)	20 years (EN ISO 13849, rate of use: 60 %)

Electrical data

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	\leq 25 mA, without load. At U _B = 24 V
Protection class	III
Digital output	
Number	1
Туре	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
Response time	≤ 1,000 µs ²⁾
Repeatability (response time)	240 μs
Switching frequency	500 Hz ³⁾

 $^{^{1)}}$ Limit values. $^{2)}$ Signal transit time with resistive load in switching mode.

³⁾ With light/dark ratio 1:1.

⁴⁾ This switching output must not be connected to another output.

Pin/Wire assignment Function of pin 4/black (BK) Digital output, dark switching, object present → output Q LOW ⁴⁾

Mechanical data

Housing	Rectangular
Design detail	Flat
Dimensions (W x H x D)	16 mm x 40.1 mm x 12.1 mm
Connection	Connector M8, 3-pin
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Male connector	Plastic, VISTAL®
Weight	Approx. 30 g
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: ≤ 50,000 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

Classifications

ECLASS 5.0	27270904
ECLASS 5.1.4	27270904
ECLASS 6.0	27270904
ECLASS 6.2	27270904
ECLASS 7.0	27270904
ECLASS 8.0	27270904
ECLASS 8.1	27270904
ECLASS 9.0	27270904
ECLASS 10.0	27270904
ECLASS 11.0	27270904

¹⁾ Limit values.

 $^{^{2)}\,\}mathrm{Signal}$ transit time with resistive load in switching mode.

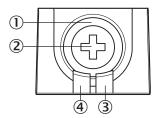
³⁾ With light/dark ratio 1:1.

 $^{^{\}rm 4)}$ This switching output must not be connected to another output.

ECLASS 12.0	27270903
ETIM 5.0	EC002719
ETIM 6.0	EC002719
ETIM 7.0	EC002719
ETIM 8.0	EC002719
UNSPSC 16.0901	39121528

Adjustments

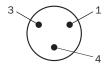
Display and adjustment elements



- ① LED blue
- ② Teach-Turn adjustment③ LED yellow
- 4 LED green

Connection type

Connector M8, 3-pin



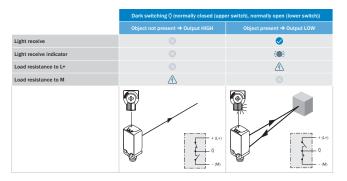
Connection diagram

Cd-514

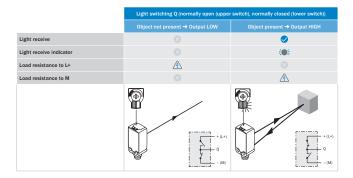


Truth table

Push-pull: PNP/NPN - dark switching Q

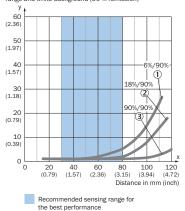


Push-pull: PNP/NPN - light switching Q

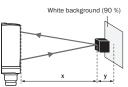


Characteristic curve

Minimum distance in mm (y) between the set sensing range and white background (90 % remission)



Example: Safe suppression of the background

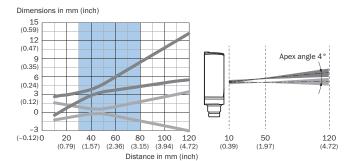


Black object (6 % remission) Set sensing range x = 80 mm Needed minimum distance to white background y = 5 mm

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- $\ensuremath{\mathfrak{G}}$ White object, 90% remission factor

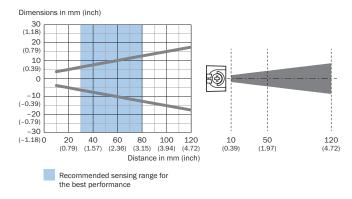
Light spot size

Vertical

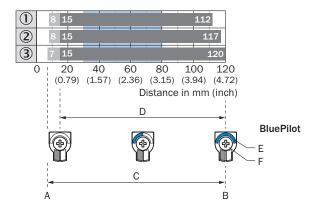


Recommended sensing range for the best performance

Horizontal

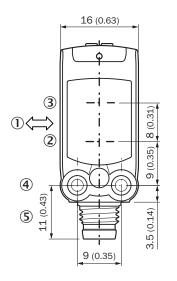


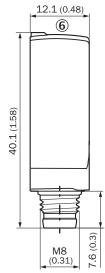
Sensing range diagram



- A = Sensing range min. in mm
- $\mathsf{B} = \mathsf{Sensing}$ range max. in mm
- C = Viewing range
- D = Adjustable switching threshold for background suppression
- E = Sensing range indicator
- F = Teach-Turn adjustment
- Recommended sensing range for the best performance
- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

Dimensional drawing (Dimensions in mm (inch))





- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- 3 Center of optical axis, receiver
- 4 M3 mounting hole
- ⑤ Connection
- ⑤ Display and adjustment elements

Recommended accessories

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

	Brief description	Туре	Part no.	
Mounting bra	Mounting brackets and plates			
	Mounting bracket for wall mounting, Stainless steel 1.4571, mounting hardware included	BEF-W4-A	2051628	
Others	Others			
	 Connection type head A: Female connector, M8, 3-pin, straight, A-coded Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 3-wire, PVC Description: Sensor/actuator cable, unshielded Application: Zones with chemicals 	YF8U13- 050VA1XLEAX	2095884	
	 Connection type head A: Male connector, M8, 3-pin, straight, A-coded Description: Unshielded Connection systems: Screw-type terminals Permitted cross-section: 0.14 mm² 0.5 mm² 	STE-0803-G	6037322	

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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