

# WTB16P-24161120A00

W16

**SMALL PHOTOELECTRIC SENSORS** 





## Ordering information

Туре	Part no.
WTB16P-24161120A00	1218626

Other models and accessories → www.sick.com/W16

Illustration may differ





#### Detailed technical data

#### **Features**

Device type	Photoelectric sensors
Functional principle	Photoelectric proximity sensor
Functional principle detail	Background suppression
Sensing range	
Sensing range min.	10 mm
Sensing range max.	1,000 mm
Adjustable switching threshold for background suppression	100 mm 1,000 mm
Reference object	Object with 90 $\%$ reflectance (referred to standard white, DIN 5033)
Minimum distance between set sensing range and background (black 6% / white 90%)	25 mm (at a distance of 400 mm)
Recommended sensing range for the best per- formance	100 mm 400 mm
Emitted beam	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	Ø 6 mm (500 mm)

Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.0° (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 <sub>a</sub> = +25 °C
Adjustment	
Teach-Turn adjustment	BluePilot: For setting the sensing range
IO-Link	For configuring the sensor parameters and Smart Task functions
Indication	
LED blue	BluePilot: sensing range indicator
LED green	Operating indicator Static on: power on Flashing: IO-Link mode
LED yellow	Status of received light beam Static on: object present Static off: object not present

# Safety-related parameters

MTTF <sub>D</sub>	629 years
DC <sub>avg</sub>	0 %
T <sub>M</sub> (mission time)	20 years (EN ISO 13849) Rate of use: 60 %

# Communication interface

IO-Link	<b>√</b> , 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
DeviceID HEX	0x80015C
DeviceID DEC	8388956
Compatible master port type	A
SIO mode support	Yes

#### Electrical data

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	$\leq$ 30 mA, without load. At U <sub>B</sub> = 24 V

<sup>1)</sup> Limit values

<sup>2)</sup> Signal transit time with resistive load in switching mode.

<sup>3)</sup> With light/dark ratio 1:1.

Protection class	III
Digital output	
Number	2 (Complementary)
Туре	Push-pull: PNP/NPN
Signal voltage PNP HIGH/LOW	Approx. U <sub>B</sub> -2.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. $U_B / < 2.5 V$
Output current I <sub>max.</sub>	≤ 100 mA
Circuit protection outputs	Reverse polarity protected Overcurrent and short-circuit protected
Response time	≤ 500 μs <sup>2)</sup>
Repeatability (response time)	150 μs
Switching frequency	1,000 Hz <sup>3)</sup>
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, light switching, object present $\rightarrow$ output Q <sub>L1</sub> HIGH; 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 $\rightarrow$ output $\bar{Q}_{L1}\text{LOW}$
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

## Mechanical data

Housing	Rectangular
Dimensions (W x H x D)	20 mm x 55.7 mm x 42 mm
Connection	Male connector M12, 4-pin
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Male connector	Plastic, VISTAL®
LABS-free	Yes (VDMA 24364-A1-L)
Weight	Approx. 50 g
Maximum tightening torque of the fixing screws	1.3 Nm

#### Ambient data

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529) IP69 (EN 60529) <sup>1)</sup>
Ambient operating temperature	-40 °C +60 °C
Ambient temperature, storage	-40 °C +75 °C
Shock resistance	$50$ g, $11$ ms (25 positive and 25 negative shocks per axis, for X, Y, Z axes, $150$ shocks in total (EN60068-2-27)) $50$ g, $6$ ms (5,000 positive and 5,000 negative shocks per axis, for X, Y, Z axes, $30,\!000$ shocks in total (EN60068-2-27))

 $<sup>^{1)}\,\</sup>mbox{Replaces IP69K}$  with ISO 20653: 2013-03.

<sup>2)</sup> Signal transit time with resistive load in switching mode.

<sup>3)</sup> With light/dark ratio 1:1.

Vibration resistance	10 Hz 2,000 Hz (Amplitude 0.5 mm / 10 g, 20 sweeps per axis, for X, Y, Z axes, 1 octave/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

<sup>&</sup>lt;sup>1)</sup> Replaces IP69K with ISO 20653: 2013-03.

## Smart Task

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Smart Task name	Base logics
Logic function	Direct AND OR Window Hysteresis
Timer function	Deactivated On delay Off delay ON and OFF delay Impulse (one shot)
Inverter	Yes
Switching frequency	SIO Logic: 800 Hz $^{1)}$ IOL: 650 Hz $^{2)}$
Response time	SIO Logic: 600 $\mu s^{1)}$ IOL: 750 $\mu s^{2)}$
Repeatability	SIO Logic: 300 $\mu$ s <sup>1)</sup> IOL: 400 $\mu$ s <sup>2)</sup>
Switching signal	
Switching signal $Q_{L1}$	Switching output
Switching signal $\bar{Q}_{L1}$	Switching output

 $<sup>^{1)}</sup>$  Use of Smart Task functions without IO-Link communication (SIO mode).  $^{2)}$  Use of Smart Task functions with IO-Link communication function.

# Diagnosis

Device status	Yes
Quality of teach	Yes

## Classifications

ECI@ss 5.0	27270904
ECI@ss 5.1.4	27270904
ECI@ss 6.0	27270904
ECI@ss 6.2	27270904
ECI@ss 7.0	27270904
ECI@ss 8.0	27270904
ECI@ss 8.1	27270904
ECI@ss 9.0	27270904
ECI@ss 10.0	27270904
ECI@ss 11.0	27270904

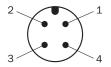
# WTB16P-24161120A00 | W16

SMALL PHOTOELECTRIC SENSORS

ECI@ss 12.0	27270903
ETIM 5.0	EC002719
ETIM 6.0	EC002719
ETIM 7.0	EC002719
ETIM 8.0	EC002719
UNSPSC 16.0901	39121528

## Connection type

M12 male connector, 4-pin



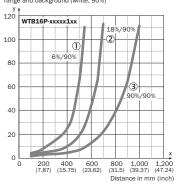
## Connection diagram

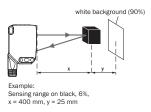
Cd-390

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#### Characteristic curve

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

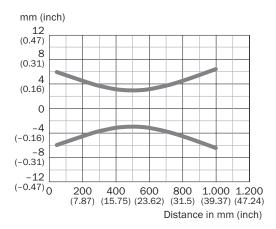




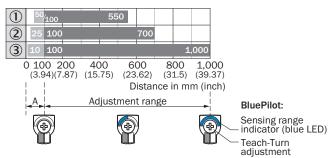
- ① Sensing range on black, 6% remission
- 3 Sensing range on white, 90% remission

## Light spot size

#### WTB16P-xxxxx1xx, WTB16P-xxxxxAxx



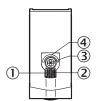
#### Sensing range diagram



- A = Detection distance (depending on object remission)
- ① Sensing range on black, 6% remission
- ② Sensing range on gray, 18 % remission
- 3 Sensing range on white, 90% remission

#### Adjustments

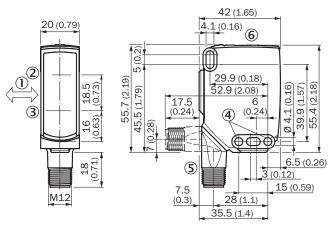
Display and adjustment elements



- ① LED indicator green
- ② LED indicator yellow
- 3 Teach-Turn adjustment
- 4 LED blue

#### Dimensional drawing (Dimensions in mm (inch))

WTB16, WTF16, WTL16, connector



- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- 3 Center of optical axis, receiver
- 4 Mounting hole, Ø 4.1 mm
- ⑤ Connection
- ⑤ Display and adjustment elements

#### Recommended accessories

Other models and accessories → www.sick.com/W16

	Brief description	Туре	Part no.	
Universal bar	clamp systems			
	Plate NO2 for universal clamp bracket, Zinc plated steel (sheet), Zinc die cast (clamping bracket), Universal clamp (5322626), mounting hardware	BEF-KHS-N02	2051608	
Distributors				
Sec.	Head A: male connector, M12, 4-pin, A-coded Head B: female connector, M12, 4-pin, A-coded Cable: Sensor/actuator cable, PVC, 0.11 m T-coupler 2 x M12 female + M12 male straight with cable	SYL-1204-G0M11-X1	6055011	
Mounting brad	ckets and plates			
y T	Adapter for mounting W16 sensors in existing W14-2/W18-3 installations or L25 sensors in existing L28 installations, plastic, fastening screws included $$	BEF-AP-W16	2095677	
Plug connectors and cables				
<b>P</b>	Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 5 m	YF2A14- 050VB3XLEAX	2096235	
	Head A: male connector, M12, 4-pin, straight Cable: unshielded	STE-1204-G	6009932	

#### Recommended services

Additional services → www.sick.com/W16

	Туре	Part no.
Function Block Factory		
• <b>Description:</b> The Function Block Factory supports common programmable logic controllers (PLCs) from various manufacturers, such as Siemens, Beckhoff, Rockwell Automation and B&R. More information on the FBF can be found <a href="https://fbf.cloud.sick.com" target="_blank"> here</a> .	Function Block Factory	On request

# 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."

# **WORLDWIDE PRESENCE:**

Contacts and other locations -www.sick.com

