OPERATING INSTRUCTIONS

WTB16 Bluetooth®

SICK
Sensor Intelligence.

OPERATING INSTRUCTIONS

WTB16 Bluetooth®

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Sensor Intelligence.

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Described product

WTB16 - Bluetooth®

Manufacturer

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Germany

Legal information

Original document

This document is an original document of SICK AG.

Contents

1 Safety information

1.1 General safety notes

- Read the operating instructions before commissioning.
-  Connection, mounting, and configuration may only be performed by trained specialists.
-  Not a safety component in accordance with the EU Machinery Directive.
-  When commissioning, protect the device from moisture and contamination.
- These operating instructions contain information required during the life cycle of the sensor.

1.2 Notes on UL approval

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

2 Intended use

The WTB16 Bluetooth is an opto-electronic photoelectric proximity sensor (referred to as “sensor” in the following) for the optical, non-contact detection of objects, animals, and persons. If the product is used for any other purpose or modified in any way, any warranty claim against SICK AG shall become void.

3 Operating and status indicators

Photoelectric proximity sensor with background suppression.

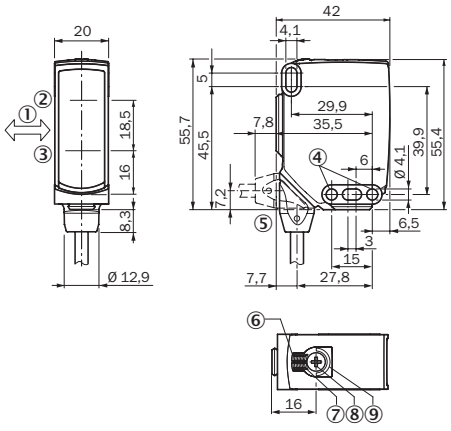


Figure 1: Dimensional drawing 1, cable

① Preferred direction of the target object

② Center of optical axis, sender

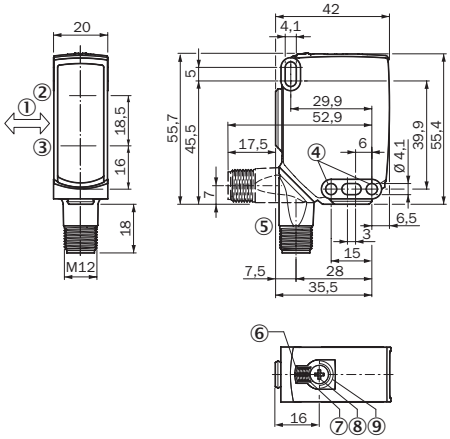


Figure 2: Dimensional drawing 2, male connector

③ Center of optical axis, receiver
④ Fixing hole, Ø4.1 mm
⑤ Connection
⑥ LED indicator green: Supply voltage active
⑦ LED indicator yellow: Status of received light beam
⑧ Press-turn element: Adjusting the sensing range
⑨ BluePilot blue: Sensing range display

4 Mounting

Mount the sensor using a suitable mounting bracket (see the SICK range of accessories).

Note the sensor's maximum permissible tightening torque of < 1,3 Nm.

Vorzugsrichtung des Objektes zum Sensor beachten, see figure 1, figure 2.

5 Electrical installation

The sensors must be connected in a voltage-free state (U_V = 0 V). The following information must be observed, depending on the connection type:

– Male connector connection: Note pin assignment.
– Cable: wire color

Only apply voltage/switch on the voltage supply (U_V > 0 V) once all electrical connections have been established.

Explanations of the connection diagram (table 1, table 2).

MF (pin 2 configuration) = external input, teach-in, switching signal

Q_{L1}/C = switching output, IO-Link communication

Table 1: DC

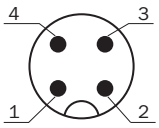
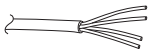
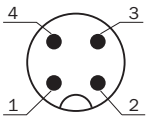
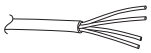
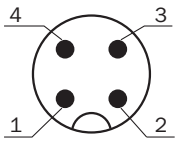
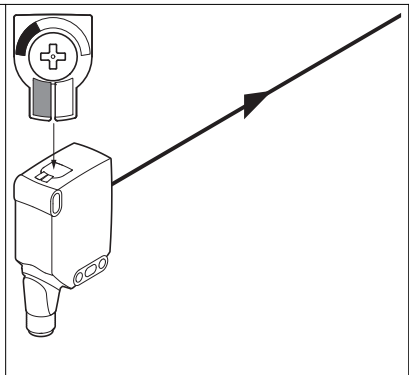
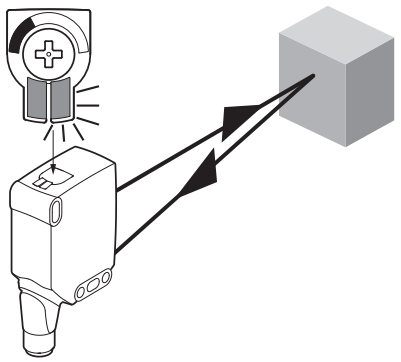
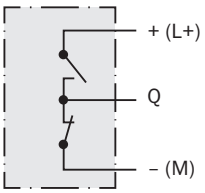
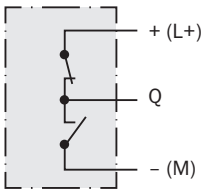
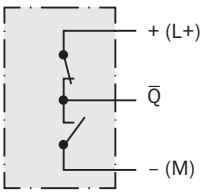
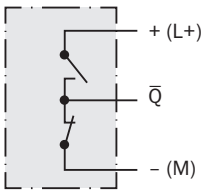
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Default: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
Default: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn 2 = wht 3 = blu 4 = blk  0.14 mm² AWG26		1 = brn 2 = wht 3 = blu 4 = blk  0.14 mm² AWG26	

Table 2: Push / pull

		
Q Push-pull (≤ 100 mA)		
$\overline{Q}$ Push-pull (≤ 100 mA)		

6 Commissioning

Bluetooth® is switched on for initial commissioning. You can get SOPASair in the Google PlayStore (Android) and in the App Store (iOS).
Operating system requirements: Android version 6.0, most current version of iOS.

1 **Alignment**

WTB16P Bluetooth®: Align sensor on object. Select the position so that the red emitted light beam hits the center of the object. You must ensure that the optical opening (front screen) of the sensor is completely clear [see figure 3, see figure 4].

WTB16I Bluetooth®: Align sensor on object. Select the position so that the infrared light (not visible) hits the center of the object. The correct alignment can only be detected via the LED indicators. see figure 3, figure 4 , see table 1, see table 2. You must ensure that the optical opening (front screen) of the sensor is completely clear.

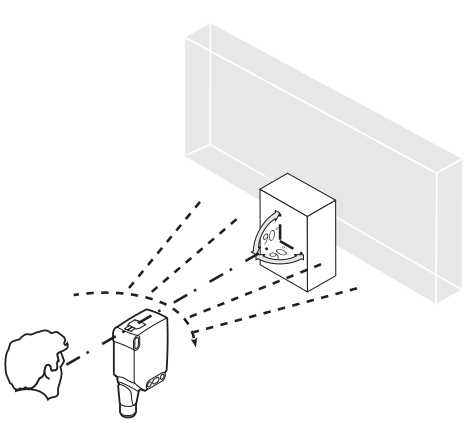


Figure 3: Alignment 1

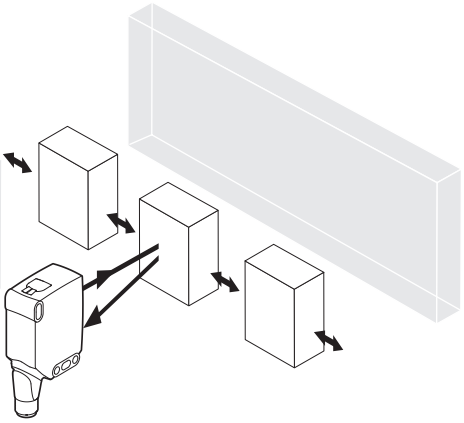


Figure 4: Alignment 2

2 **Sensing range**

Check the application conditions: Adjust the sensing range and distance to the object or background and the remission capability of the object according to the corresponding diagram [see figure 5 and 7] (x = sensing range, y = minimum distance between set sensing range and background (white, 90%)) Remission: 6% = black ①, 18% = gray ②, 90% = white ③ (referring to standard white as per DIN 5033). We recommend making the adjustments using an object with a low remission.

The minimum distance (= y) for background suppression can be determined from diagram [figure 5 ①] as follows:

Example: x = 400 mm, y = 25 mm. That is, the background (white, 90%) is suppressed at a distance of > 25 mm from the sensor.

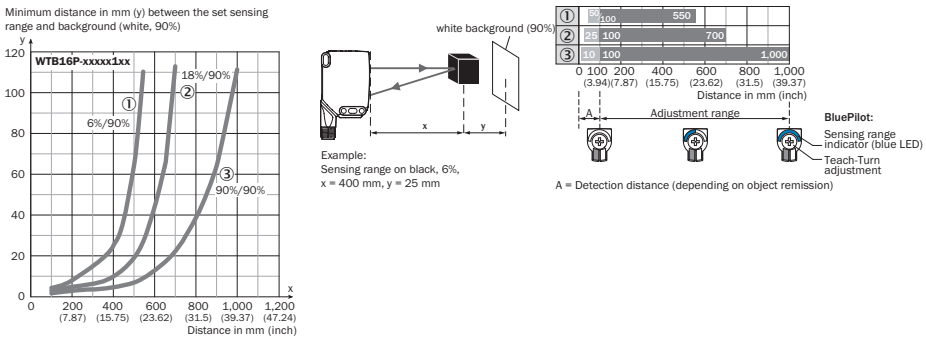


Figure 5: Characteristic line 1, WTB16P Bluetooth-xxxxx1xx, red light

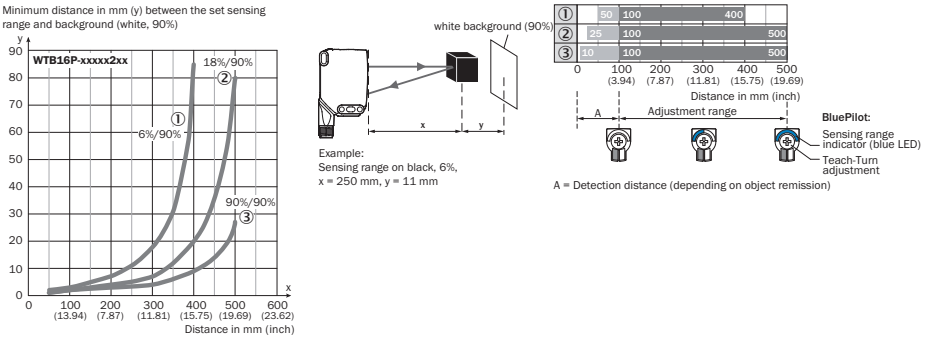


Figure 6: Characteristic line 2, WTB16P Bluetooth-xxxxx2xx, red light

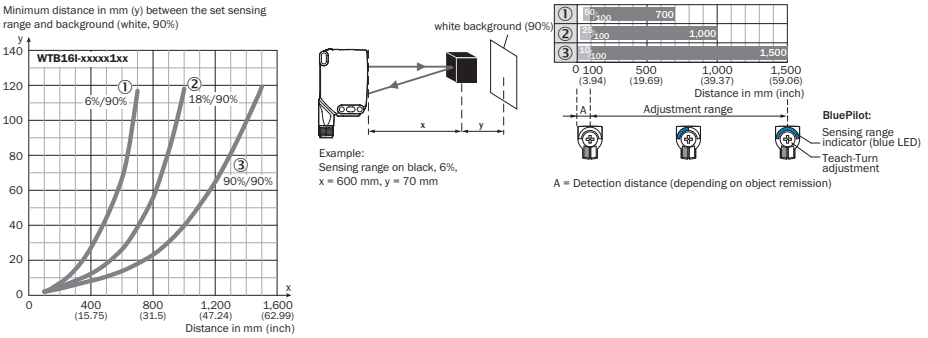


Figure 7: Characteristic line 3, WTB16I Bluetooth-xxxxx1xx, infrared light

Sensing range setting

WTB16x-xxxxxx2xAxx with press-turn element:
The sensing range is adjusted by pressing the teach-in button (approx. 1-3 sec.).
Depending on the requirements, the potentiometer can be used for fine-tuning (without pressing the teach-in button).
Clockwise rotation: sensing range increased.
Counterclockwise rotation: sensing range reduced.
The sensing range can also be adjusted using just the potentiometer. We recommend placing the object within the sensing range, see figure 8 for an example. Once the sensing range has been adjusted, the object is removed from the path of the beam, which causes the background to be suppressed and the switching output to change (see table 1, table 2).

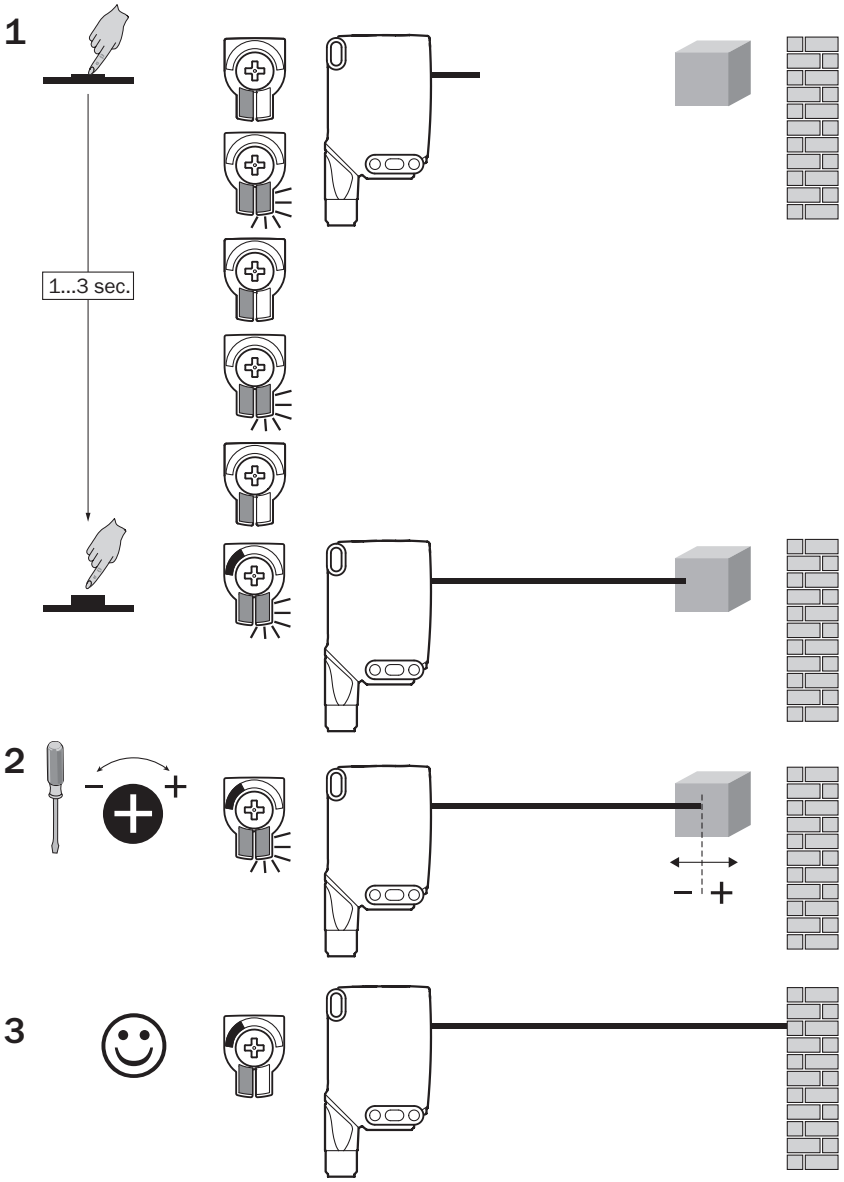


Figure 8: WTB16x-xxxxxx2xAxx, adjusting the sensing range with press-turn element

WTB16x-xxxxxx1xAxx with potentiometer:
The sensing range is adjusted with the potentiometer.
Clockwise rotation: sensing range increased.
Counterclockwise rotation: sensing range reduced.
We recommend placing the object within the sensing range, see figure 9 for an example. Once the sensing range has been adjusted, the object is removed from the path of the beam, which causes the background to be suppressed and the switching output to change (see table 1, table 2).

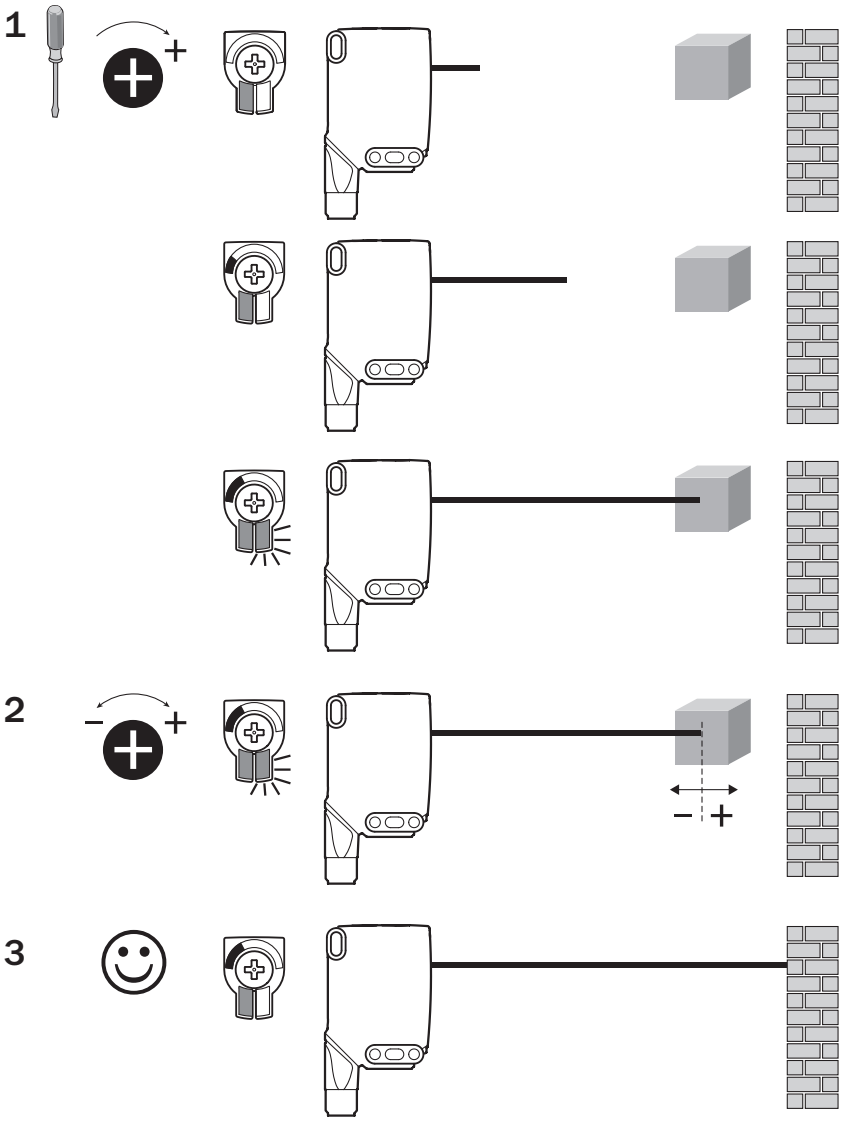


Figure 9: WTB16x-xxxxxx1xAxx, adjusting the sensing range with potentiometer

WTB16x-xxxxxx3xAxx with teach-in button:
The sensing range is adjusted by pressing the teach-in button (approx. 1-3 sec.). We recommend placing the object within the sensing range, see figure 10 for an example. Once the sensing range has been adjusted, the object is removed from the path of the beam, which causes the background to be suppressed and the switching output to change (see table 1, table 2).

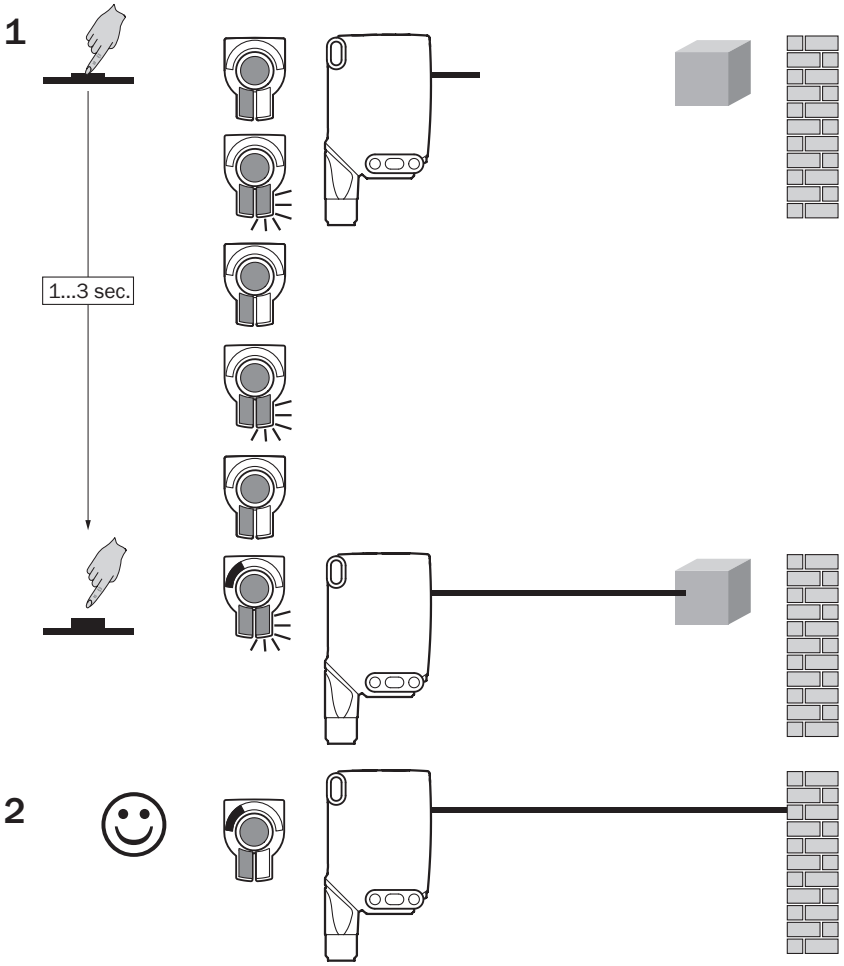


Figure 10: WTB16x-xxxxxx3xAxx, adjusting the sensing range with teach-in button

Process data structure (Version 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Process data	2 bytes					4 bytes
	Byte 0: bits 15... 8 Byte 1: bits 7... 0					Byte 0: bits 31... 24 Byte 1: bits 13... 16 Byte 2: bits 15... 8 Byte 3: bits 7... 0
Bit 0 / Data type	Q_{L1} / Boolean					
Bit 1 / Data type	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Bit... / Description / Data type	2 ...15 / [empty]	2 ...15 / [time measurement value] / UInt 14	2 ... 15 / [counter value] / UInt 14	2 ... 15 / [length / speed measurement] / SInt14	2 / Qint. 1 / Boolean	2 ... 7 / [empty]
Bit... / Description / Data type					3 ... 15 / [time measurement value] / UInt13	8 ... 31 / [carrier load] / UInt 24

7 Troubleshooting

The Troubleshooting table indicates measures to be taken if the sensor stops working.

LED indicator/fault pattern	Cause	Measures
Green LED flashes	IO-Link communication	None
Switching outputs do not behave in accordance with table 2	1. IO-Link communication 2. Change of the configuration 3. Short-circuit	1. None 2. Adjustment of the configuration 3. Check electrical connections
Yellow LED lights up, no object in the path of the beam	The sensing range distance is too large	Reduce the sensing range
Object is in the path of the beam, yellow LED does not light up	Distance between the sensor and the object is too long or sensing range is set too short	Increase the sensing range
The sensor is not displayed in SOPASair	1. Connection to another hand-held exists. 2.The hand-held is outside of the transmission range of the sensor. 3. Bluetooth LE in the sensor is deactivated. 4. Bluetooth LE in the hand-held is deactivated.	1. No connection or deactivation of the existing connection. 2. Thorough check of installation situation (e.g. shielding by metal). 3. Activation of Bluetooth LE via SiLink2 master or IO-Link 4. Activation of Bluetooth LE 5. No or change to MAC address filter.

LED indicator/fault pattern	Cause	Measures
	5. MAC address filter activated, hand-held not authorized.	
No connection can be made to the sensor	1. The Android or iOS version does not comply with requirements. 2. SOPASair version does not contain the required driver.	1. Check the operating system. 2. Uninstall SOPASair, install the most current app version.

8 Disassembly and disposal

The sensor must be disposed of according to the applicable country-specific regulations. Efforts should be made during the disposal process to recycle the constituent materials (particularly precious metals).

NOTE

Disposal of batteries, electric and electronic devices

- According to international directives, batteries, accumulators and electrical or electronic devices must not be disposed of in general waste.
- The owner is obliged by law to return this devices at the end of their life to the respective public collection points.
- 

  This symbol on the product, its package or in this document, indicates that a product is subject to these regulations.

9 Maintenance

SICK sensors are maintenance-free.

We recommend doing the following regularly:

- Clean the external lens surfaces
- Check the screw connections and plug-in connections

No modifications may be made to devices.

Subject to change without notice. Specified product properties and technical data are not written guarantees.

10 Approvals

10.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries** Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO),

Country	Comments
	Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

11 Technical data

11.1 Technical data

	WTB16P Bluetooth	WTB16I Bluetooth
Sensing range max.	10 mm ... 1.000 mm (type)[1]	10 mm ... 1.500 mm[1]
Light spot diameter/distance	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (type)	Ø 12 mm (800 mm)
Supply voltage V_S	DC 10 ... 30 V	DC 10 ... 30 V
Current consumption	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Output current $I_{max.}$	≤ 100 mA	≤ 100 mA
Max. response time	500 µs[4]	500 µs[4]
Switching frequency	1000 Hz[5]	1000 Hz[5]
Enclosure rating	IP66, IP67	IP66, IP67
Protection class	III	III
Circuit protection	A, B, C, D[6]	A, B, C, D[6]
Ambient operating temperature	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Object with 90 % remission (based on standard white DIN 5033)
2 16 VDC to 30 VDC, without load
3 10 VDC to 16 VDC, without load
4 Signal transit time with resistive load in switching mode. Deviating values possible in COM2 mode.
5 With a light/dark ratio of 1:1 in switching mode. Deviating values possible in IO-Link mode.
6 A = U_V-connections reverse polarity protected
B = inputs and output reverse-polarity protected
C = Interference suppression
D = outputs overcurrent and short-circuit protected

11.2 Bluetooth technical data®

Features	Values
Bluetooth® sensing range	100 m on sight
Radio type	BLE
Radio class	2
Bluetooth® module manufacturer	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
RF band	2,402 - 2,480 MHz
Output power	2 dBM
Declaration ID	D033906
Qualified design ID	89630
Specification name	4.1
Member company	SICK AG

BETRIEBSANLEITUNG

WTB16 Bluetooth®

SICK
Sensor Intelligence.

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Beschriebenes Produkt

WTB16 - Bluetooth®

Hersteller

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Deutschland

Rechtliche Hinweise

Originaldokument

Dieses Dokument ist ein Originaldokument der SICK AG.

Inhalt

12 Zu Ihrer Sicherheit

12.1 Allgemeine Sicherheitshinweise

- Lesen Sie vor der Inbetriebnahme des Geräts die Betriebsanleitung.
- Der Anschluss, die Montage und die Konfiguration des Geräts dürfen nur von geschultem Fachpersonal vorgenommen werden.
- Bei diesem Gerät handelt es sich um kein sicherheitsgerichtetes Bauteil im Sinne der EU-Maschinenrichtlinie.
- Bei der Inbetriebnahme ist das Gerät ausreichend vor Feuchtigkeit und Verschmutzung zu schützen.
- Die vorliegende Betriebsanleitung enthält Informationen, die während des Lebenszyklus der Lichtschranke benötigt werden.

12.2 Hinweise zur UL Zulassung

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

13 Bestimmungsgemäße Verwendung

Die WTB16 Bluetooth ist ein optoelektronischer Reflexions-Lichttaster (im Folgenden Sensor genannt) und wird zum optischen, berührungslosen Erfassen von Sachen, Tieren und Personen eingesetzt. Bei jeder anderen Verwendung und bei Veränderungen am Produkt verfällt jeglicher Gewährleistungsanspruch gegenüber der SICK AG.

14 Bedien- und Anzeigeelemente

Reflexionslichttaster mit Hintergrundausblendung.

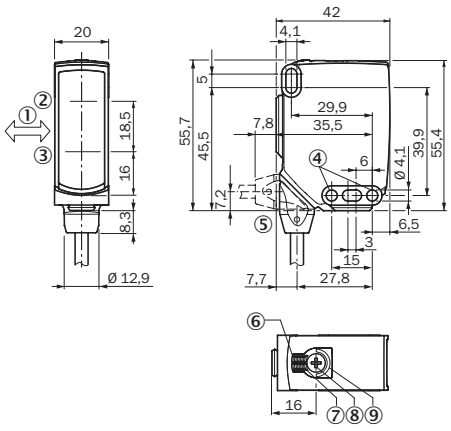

Abbildung 11: Maßzeichnung 1, Leitung

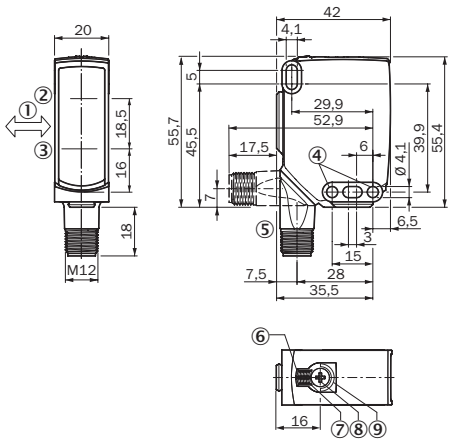

Abbildung 12: Maßzeichnung 2, Stecker

① Vorzugsrichtung des Tastgutes

② Mitte Optikachse Sender
③ Mitte Optikachse Empfänger
④ Befestigungsbohrung, Ø4,1 mm
⑤ Anschluss
⑥ Anzeige-LED grün: Betriebsspannung aktiv
⑦ Anzeige-LED gelb: Status Lichtempfang
⑧ Drück-Dreh-Element: Einstellung des Schaltabstands
⑨ BluePilot blau: Schaltabstandsanzeige

15 Montage

Den Sensor an einen geeigneten Befestigungswinkel montieren (siehe SICK-Zubehör-Programm).

Maximal zulässiges Anzugsdrehmoment des Sensors von < 1,3 Nm beachten.

Vorzugsrichtung des Objektes zum Sensor beachten, siehe Abbildung 11, Abbildung 12.

16 Elektrische Installation

Anschluss der Sensoren muss spannungsfrei (U_V = 0 V) erfolgen. Je nach Anschlussart sind die folgenden Informationen zu beachten:

- Steckeranschluss: Pinbelegung beachten.
- Leitung: Adernfarbe

Erst nach Anschluss aller elektrischen Verbindungen die Spannungsversorgung (U_V > 0 V) anlegen bzw. einschalten.

Erläuterungen zum Anschlussschema (Tabelle 3, Tabelle 4).

MF (Pin-2-Konfiguration) = Externer Eingang, Teach-in, Schaltsignal

Q_{L1}/C = Schaltausgang, IO-Link Kommunikation

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Subject to change without notice

Tabelle 3: DC

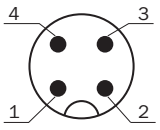
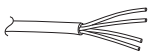
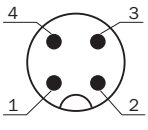
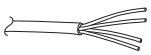
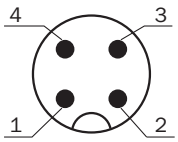
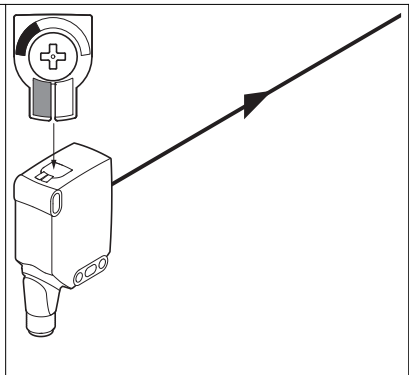
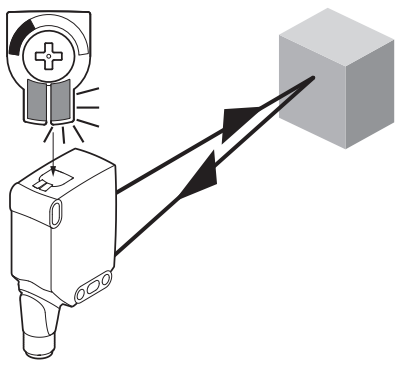
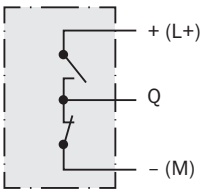
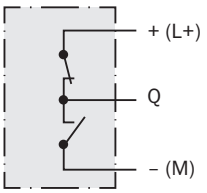
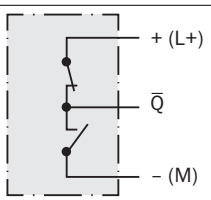
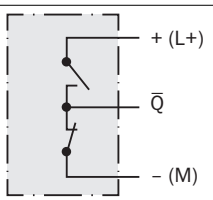
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Default: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
Default: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn 2 = wht 3 = blu 4 = blk  0.14 mm² AWG26		1 = brn 2 = wht 3 = blu 4 = blk  0.14 mm² AWG26	

Tabelle 4: Push / Pull

		
Q push-pull (≤ 100 mA)		
$\overline{Q}$ push-pull (≤ 100 mA)		

17 Inbetriebnahme

Bluetooth® ist bei der Ersteinbetriebnahme eingeschaltet. SOPASair erhalten Sie im Google PlayStore (Android) und im App Store (iOS).
Anforderungen an das Betriebssystem: Android-Version 6.0, iOS aktuellste Version.

1 **Ausrichtung**

WTB16P Bluetooth®: Sensor auf Objekt ausrichten. Positionierung so wählen, dass der rote Sendelichtstrahl in der Mitte des Objekts auftrifft. Es ist darauf zu achten, dass die optische Öffnung (Frontscheibe) des Sensors vollständig frei ist [siehe Abbildung 13, Abbildung 14].

WTB16I Bluetooth®: Sensor auf Objekt ausrichten. Positionierung so wählen, dass das Infrarotlicht (nicht sichtbar) in der Mitte des Objekts auftrifft. Die korrekte Ausrichtung kann nur über die Anzeige-LEDs erkannt werden. siehe Abbildung 13, Abbildung 14, Tabelle 3, Tabelle 4. Es ist darauf zu achten, dass die optische Öffnung (Frontscheibe) des Sensors vollständig frei ist.

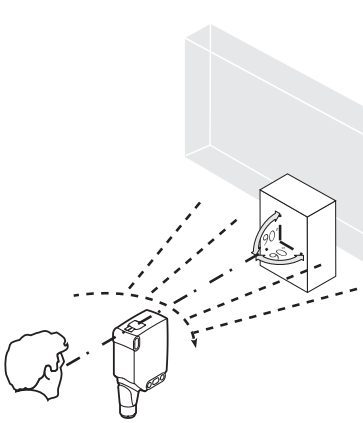


Abbildung 13: Ausrichtung 1

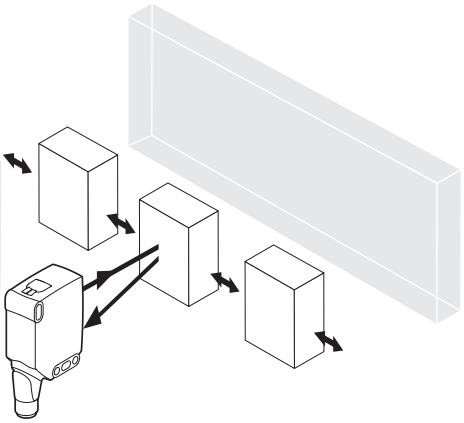


Abbildung 14: Ausrichtung 2

2 **Schaltabstand**

Einsatzbedingungen prüfen: Schaltabstand und Distanz zum Objekt bzw. Hintergrund sowie Remissionsvermögen des Objektes mit dem zugehörigen Diagramm [siehe Abbildung 5 und 7] abgleichen (x = Schaltabstand, y = Mindestabstand zwischen eingestelltem Schaltabstand und Hintergrund (weiß, 90%)) Remission: 6 % = schwarz ①, 18 % = grau ②, 90 % = weiß ③ (bezogen auf Standardweiß nach DIN 5033). Wir empfehlen, die Einstellung mit einem Objekt von niedriger Remission vorzunehmen.

Die minimale Distanz (= y) für die Hintergrundausblendung kann aus dem Diagramm [Abbildung 15 ①] wie folgt ermittelt werden:

Beispiel: x = 400 mm, y = 25 mm. D. h. der Hintergrund (weiß, 90%) wird ab einer Distanz von > 25 mm vom Sensor ausgeblendet.

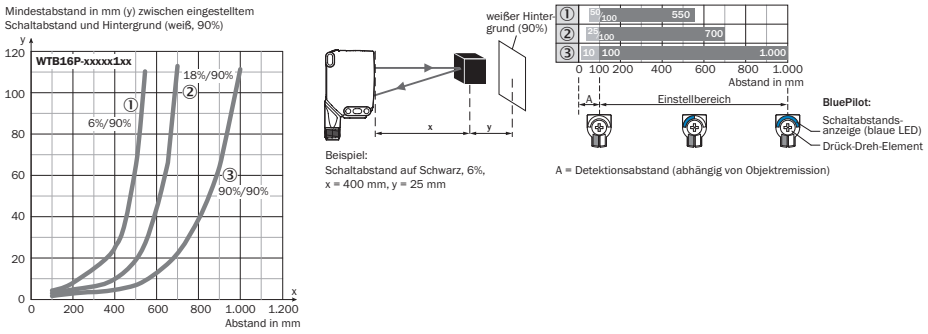


Abbildung 15: Kennlinie 1, WTB16P Bluetooth-xxxxx1xx, Rotlicht

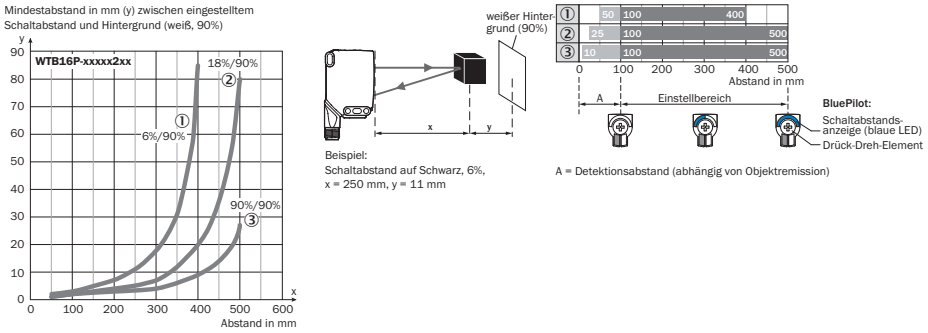


Abbildung 16: Kennlinie 2, WTB16P Bluetooth-xxxxx2xx, Rotlicht

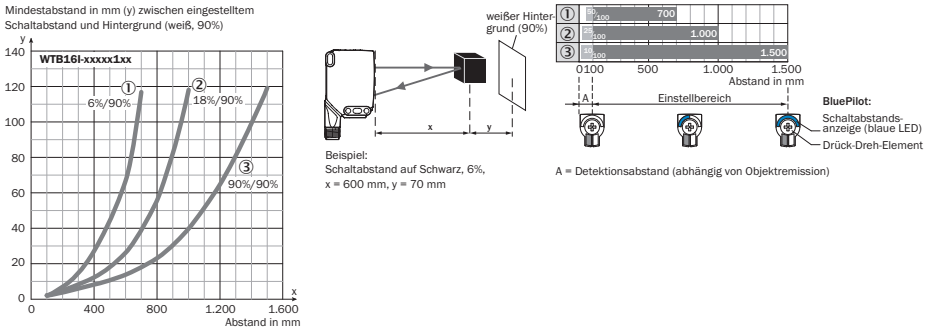


Abbildung 17: Kennlinie 3, WTB16I Bluetooth-xxxxx1xx, Infrarotlicht

Einstellung Schaltabstand

WTB16x-xxxxxx2xAxx mit Drück-Dreh-Element:
Durch Drücken der Teach-in-Taste (ca. 1- 3 sec.) wird der Schaltabstand eingestellt. Je nach Anforderungen kann mit dem Potentiometer (ohne Drücken der Teach-in-Taste) eine Feineinstellung vorgenommen werden.
Drehung nach rechts: Erhöhung des Schaltabstandes.
Drehung nach links: Verringerung des Schaltabstandes.
Der Schaltabstand kann auch alleinig mit dem Potentiometer eingestellt werden. Wir empfehlen, den Schaltabstand in das Objekt zu legen, z.B. siehe Abbildung 8. Nachdem der Schaltabstand eingestellt worden ist, das Objekt aus dem Strahlengang entfernen, der Hintergrund wird dabei ausgeblendet und der Schaltausgang ändert sich (siehe Tabelle 3, Tabelle 4).

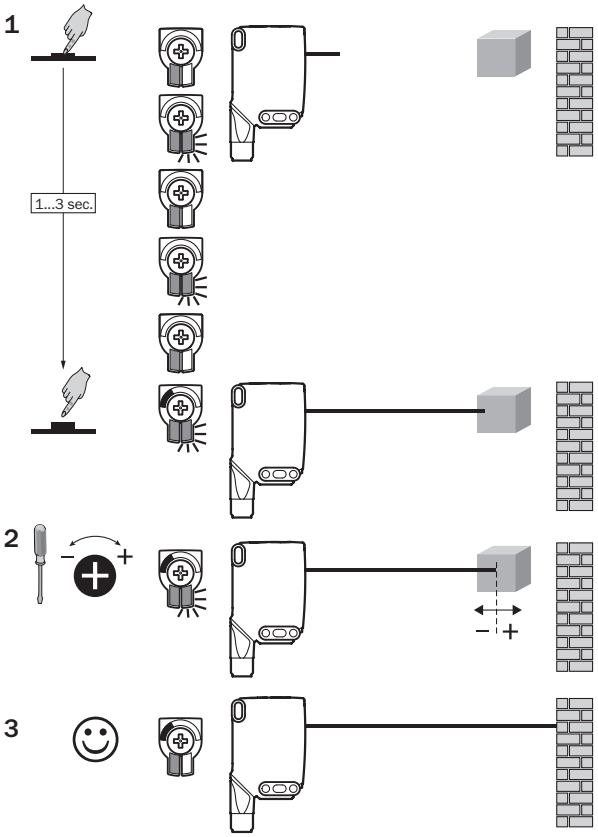


Abbildung 18: WTB16x-xxxxxx2xAxx, Einstellung des Schaltabstandes mit Drück-Dreh-Element

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WTB16x-xxxxxx1xAxx mit Potentiometer:
Mit dem Potentiometer wird der Schaltabstand eingestellt.
Drehung nach rechts: Erhöhung des Schaltabstandes.
Drehung nach links: Verringerung des Schaltabstandes.
Wir empfehlen, den Schaltabstand in das Objekt zu legen, z.B. siehe Abbildung 9. Nachdem der Schaltabstand eingestellt worden ist, das Objekt aus dem Strahlengang entfernen, der Hintergrund wird dabei ausgeblendet und der Schaltausgang ändert sich (siehe Tabelle 3, Tabelle 4).

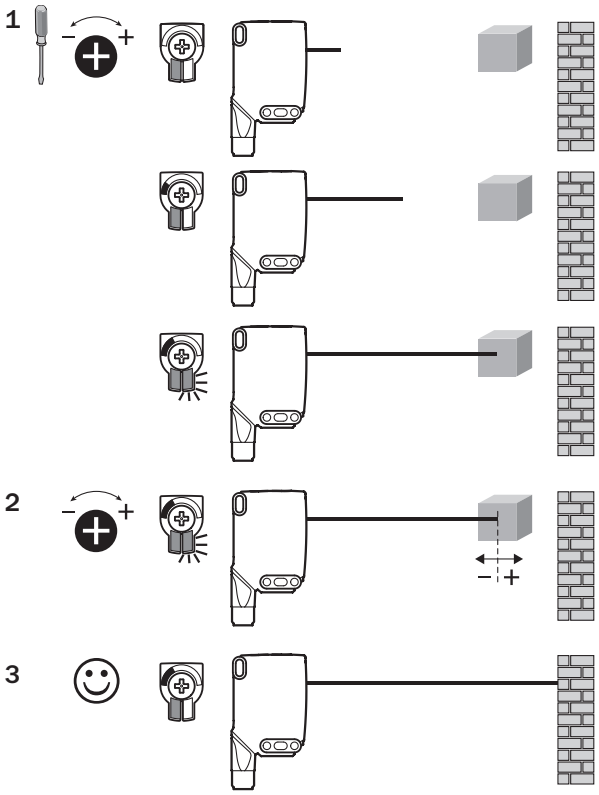

Abbildung 19: WTB16x-xxxxxx1xAxx, Einstellung des Schaltabstandes mit Potentiometer

WTB16x-xxxxxx3xAxx mit Teach-in-Taste:
Durch Drücken der Teach-in-Taste (ca. 1- 3 sec.) wird der Schaltabstand eingestellt. Wir empfehlen, den Schaltabstand in das Objekt zu legen, z.B. siehe Abbildung 10. Nachdem der Schaltabstand eingestellt worden ist, das Objekt aus dem Strahlengang entfernen, der Hintergrund wird dabei ausgeblendet und der Schaltausgang ändert sich (siehe Tabelle 3, Tabelle 4).

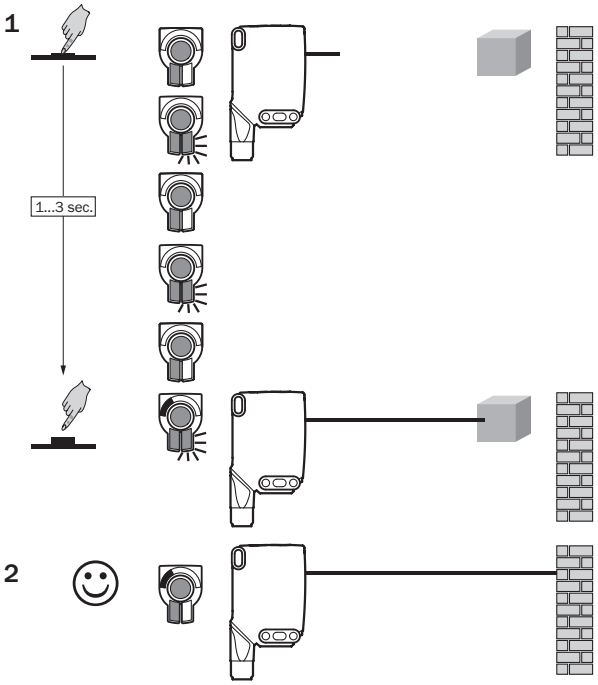

Abbildung 20: WTB16x-xxxxxx3xAxx, Einstellung des Schaltabstandes mit Teach-in-Taste

Process data structure (Version 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Process data	2 Byte					4 Byte
	Byte 0 : Bit 15... 8 Byte 1: Bit 7... 0					Byte 0 : Bit 31... 24 Byte 1: Bit 13... 16 Byte 2: Bit 15... 8 Byte 3: Bit 7... 0
Bit 0/ Data type	Q_{L1} / Boolean					
Bit 1/ Data type	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Bit... / Description / Data type	2...15 / [empty]	2...15 / [Time measurement value] / UInt 14	2 ... 15 / [Counter value] / UInt 14	2 ... 15 / [Length / speed measurement] / SInt14	2 / Qint. 1 / Boolean	2...7 / [empty]
Bit... / Description / Data type					3 ... 15 / [Time measurement value] / UInt13	8 ... 31 / [Carrier load] / UInt 24

18 Störungsbehebung

Tabelle Störungsbehebung zeigt, welche Maßnahmen durchzuführen sind, wenn die Funktion des Sensors nicht mehr gegeben ist.

Anzeige-LED / Fehlerbild	Ursache	Maßnahme
grüne LED blinkt	IO-Link Kommunikation	keine
Schaltausgänge verhalten sich nicht gemäß Tabelle 4	1. IO-Link Kommunikation 2. Änderung der Konfiguration 3. Kurzschluss	1. keine 2. Anpassung der Konfiguration 3. Elektrische Anschlüsse prüfen
gelbe LED leuchtet, kein Objekt im Strahlengang	Schaltabstand ist auf zu großen Abstand eingestellt	Schaltabstand verringern
Objekt ist im Strahlengang, gelbe LED leuchtet nicht	Abstand zwischen Sensor und Objekt ist zu groß oder Schaltabstand ist zu gering eingestellt	Schaltabstand vergrößern
In SOPASair wird der Sensor nicht angezeigt	1. Verbindung zu einem anderen Handheld besteht. 2.Das Handheld befindet sich außerhalb des Sendebereichs des Sensors. 3. Bluetooth LE im Sensor ist deaktiviert. 4. Bluetooth LE im Handheld ist deaktiviert.	1. keine bzw. Deaktivierung der bestehenden Verbindung. 2. Prüfung der Einbausituation (z.B. Abschirmung durch Metall). 3. Aktivierung von Bluetooth LE per SiLink2 Master oder IO-Link 4. Aktivierung von Bluetooth LE

Anzeige-LED / Fehlerbild	Ursache	Maßnahme
	5. MAC-Adressfilter aktiviert, Handheld nicht autorisiert.	5. keine bzw. Änderung des MAC-Adress-Filters.
Es kann keine Verbindung zum Sensor aufgebaut werden	1. Die Android bzw. iOS-Version entspricht nicht den Anforderungen. 2. SOPASair Version enthält nicht den erforderlichen Treiber.	1. Prüfen Sie das Betriebssystem. 2. Deinstallieren Sie SOPASair, Installieren Sie die aktuellste App-Version.

19 Demontage und Entsorgung

Die Lichtschranke muss entsprechend den geltenden länderspezifischen Vorschriften entsorgt werden. Bei der Entsorgung sollte eine werkstoffliche Verwertung (insbesondere der Edelmetalle) angestrebt werden.

HINWEIS

Entsorgung von Batterien, Elektro- und Elektronikgeräten

- Gemäß den internationalen Vorschriften dürfen Batterien, Akkus sowie Elektro- und Elektronikgeräte nicht mit dem Hausmüll entsorgt werden.
- Der Besitzer ist gesetzlich verpflichtet, diese Geräte am Ende ihrer Lebensdauer bei den entsprechenden öffentlichen Sammelstellen abzugeben.
- 

  Dieses Symbol auf dem Produkt, dessen Verpackung oder im vorliegenden Dokument gibt an, dass ein Produkt den genannten Vorschriften unterliegt.

20 Wartung

SICK-Sensoren sind wartungsfrei.

Wir empfehlen, in regelmäßigen Abständen

- die optischen Grenzflächen zu reinigen
- Verschraubungen und Steckverbindungen zu überprüfen

Veränderungen an Geräten dürfen nicht vorgenommen werden.

Irrtümer und Änderungen vorbehalten. Angegebene Produkteigenschaften und technische Daten stellen keine Garantieerklärung dar.

21 Zulassungen

21.1 Bluetooth® Zulassungen

Land	Kommentare
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europa + EFTA	**EU Länder** Belgium (BE), Bulgaria (BG), Denm ark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania

Land	Kommentare
	(RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), Unit ed Kingdom (GB), Republic of Cyprus (CY). **EFTA Länder** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

22 Technische Daten

22.1 Technische Daten

	WTB16P Bluetooth	WTB16I Bluetooth
Schaltabstand max.	10 mm ... 1.000 mm (Typ)[1]	10 mm ... 1.500 mm[1]
Lichtfleckdurchmesser/Entfernung	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (Typ)	Ø 12 mm (800 mm)
Versorgungsspannung U_V	DC 10 ... 30 V	DC 10 ... 30 V
Stromaufnahme	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Ausgangsstrom $I_{max.}$	≤ 100 mA	≤ 100 mA
Ansprechzeit max.	500 µs[4]	500 µs[4]
Schaltfrequenz	1000 Hz[5]	1000 Hz[5]
Schutzart	IP66, IP67	IP66, IP67
Schutzklasse	III	III
Schutzschaltungen	A, B, C, D[6]	A, B, C, D[6]
Betriebsumgebungstemperatur	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Tastgut mit 90 % Remission (bezogen auf Standard-Weiß DIN 5033)
2 16VDC...30VDC, ohne Last
3 10VDC...16VDC, ohne Last
4 Signallaufzeit bei ohmscher Last im Schaltmodus. Abweichende Werte im COM2-Modus möglich.
5 Bei Hell-Dunkel-Verhältnis 1:1 im Schaltmodus. Abweichende Werte im IO-Link-Modus möglich.
6 A = U_V-Anschlüsse verpolsicher
B = Ein- und Ausgänge verpolsicher
C = Störimpulsunterdrückung
D = Ausgänge überstrom- und kurzschlussfest

22.2 Technische Daten Bluetooth®

Merkmale	Werte
Bluetooth® Reichweite	100 m auf Sicht
Funkart	BLE
Funkklasse	2
Hersteller Bluetooth® Modul	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
RF Band	2402 - 2480 MHz
Ausgangs-Leistung	2 dBM
Declaration ID	D033906
Qualified Design ID	89630
Specification Name	4.1
Mitglieds Unternehmen	SICK AG

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NOTICE D'INSTRUCTION

WTB16 Bluetooth®

SICK
Sensor Intelligence.

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Produit décrit

WTB16 - Bluetooth®

Fabricant

SICK AG
Erwin-Sick-Straße 1
79183 Waldkirch
Allemagne

Remarques juridiques

Document original

Ce document est un document original de SICK AG.

Contenu

23 Pour votre sécurité

23.1 Consignes générales de sécurité

- Lire la notice d'instruction avant la mise en service.
-  Le raccordement, le montage et la configuration ne doivent être réalisés que par un personnel qualifié.
-  N'est pas un composant de sécurité selon la Directive machines de l'UE.
-  Lors de la mise en service, protéger l'appareil contre l'humidité et la contamination.
- Cette notice d'instruction contient des informations nécessaires durant le cycle de vie du capteur.

23.2 Remarques sur l'homologation UL

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

24 Utilisation conforme

WTB16 Bluetooth est un détecteur à réflexion directe optoélectronique (appelé capteur dans ce document) qui permet la détection optique sans contact d'objets, d'animaux et de personnes. Toute autre utilisation ou modification du produit annule la garantie de SICK AG.

25 Éléments de commande et d'affichage

Détecteur à réflexion directe avec élimination d'arrière-plan

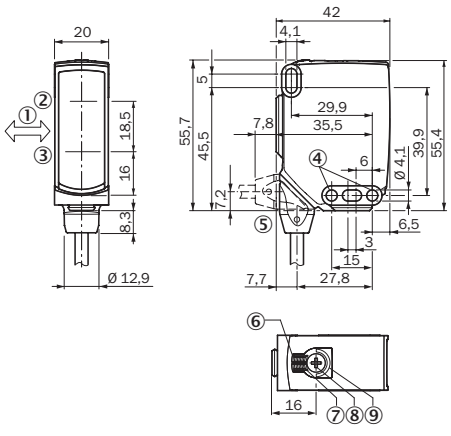


Illustration 21: Plan coté 1, câble

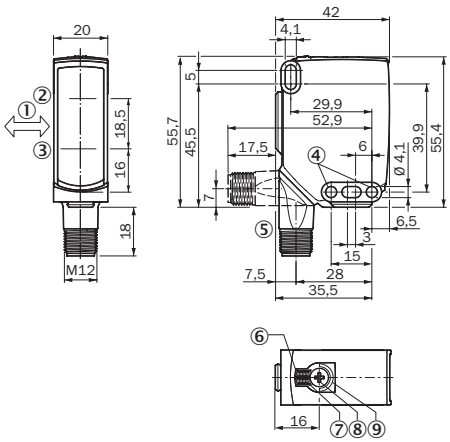


Illustration 22: Plan coté 2, connecteur mâle

① Sens recommandé de l'objet à détecter

② Centre de l'axe optique émetteur

③ Centre de l’axe optique récepteur
④ Trou de fixation, ØØ 4,1 mm
⑤ Raccordement
⑥ LED d’état verte : tension d’alimentation active
⑦ LED d’état jaune : état réception de lumière
⑧ Bouton poussoir rotatif : réglage de la distance de commutation
⑨ BluePilot bleu : indication de la distance de commutation

26 Montage

Montez le capteur sur une équerre de fixation adaptée (voir la gamme d’accessoires SICK).

Respecter le couple de serrage maximum autorisé du capteur de < 1,3 Nm.

Vorzugsrichtung des Objektes zum Sensor beachten, voir illustration 21, illustration 22.

27 Installation électrique

Le raccordement des capteurs doit s’effectuer hors tension (U_V = 0 V). Selon le mode de raccordement, respecter les informations suivantes :

– Raccordement du connecteur : respecter l’affectation des broches.
– Câble : couleur des fils

Après avoir terminé tous les raccordements électriques, appliquer ou activer l’alimentation électrique (U_V > 0 V).

Explications du schéma de raccordement (tableau 5, tableau 6).

MF (configuration broche 2) = entrée externe, apprentissage, signal de commutation

Q_{L1}/C = sortie de commutation, communication IO-Link

Tableau 5: CC

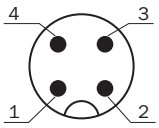
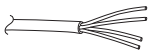
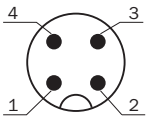
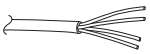
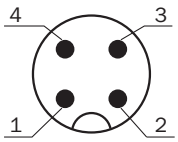
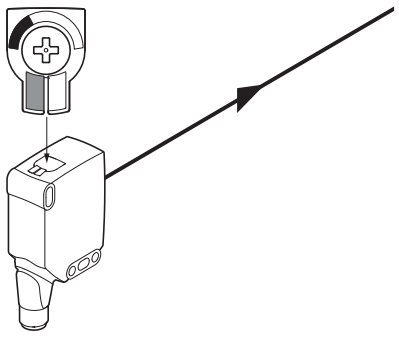
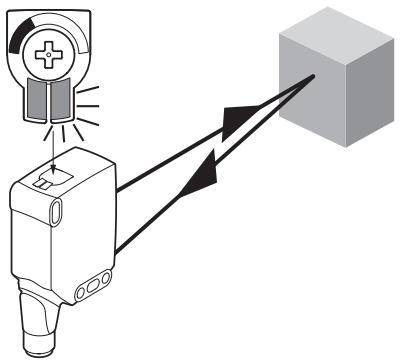
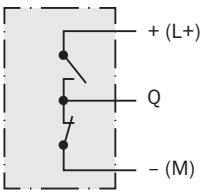
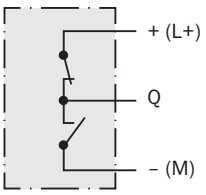
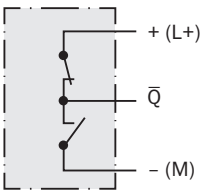
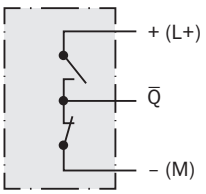
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Par défaut : MF	$\overline{Q}$	$\overline{Q}$	Sortie Q	Sortie Q	www.sick.com 8022709
Par défaut : Q_{L1}/C	Sortie Q	Sortie Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn (marron) 2 = wht (blanc) 3 = blu (bleu) 4 = blk (noir)  0,14 mm² AWG26		1 = brn (marron) 2 = wht (blanc) 3 = blu (bleu) 4 = blk (noir)  0,14 mm² AWG26	

Tableau 6: Push/Pull

		
Sortie Q Push-pull (≤ 100 mA)		
$\overline{Q}$ Push-pull (≤ 100 mA)		

28 Mise en service

Bluetooth® est activé lors de la première mise en service. SOPASair est disponible sur Google PlayStore (Android) et l'App Store (iOS).

Système d'exploitation requis : version Android 6.0, dernière version iOS.

1 **Alignement**

WTB16P Bluetooth®: aligner le capteur sur l'objet. Choisir la position de sorte que le faisceau lumineux émis rouge touche l'objet en plein centre. S'assurer que l'ouverture optique (vitre frontale) du capteur est parfaitement dégagée [illustration 23, illustration 24].

WTB16I Bluetooth®: aligner le capteur sur l'objet. Choisir la position de sorte que le faisceau infrarouge (invisible) touche l'objet en plein centre. Seules les LED permettent de savoir si l'alignement est correct. voir illustration 23, illustration 24, voir tableau 5, tableau 6. S'assurer que l'ouverture optique (vitre frontale) du capteur est parfaitement dégagée.

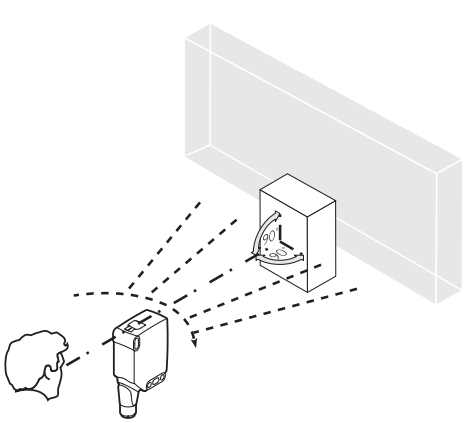


Illustration 23: Alignement 1

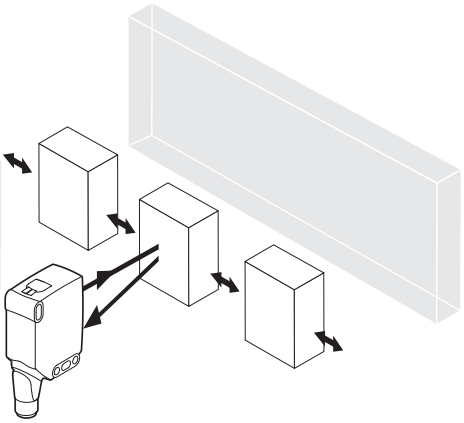


Illustration 24: Alignement 2

2 **Distance de commutation**

Vérifier les conditions d'utilisation : comparer la distance de commutation et la distance par rapport à l'objet ou à l'arrière-plan et les caractéristiques de rémission de l'objet avec le diagramme correspondant [voir illustrations 5 et 7] (x = distance de commutation, y = distance minimale entre l'objet et l'arrière-plan (blanc, 90 %)) Rémission : 6 % = noir ①, 18 % = gris②, 90 % = blanc ③ (par rapport au blanc standard selon DIN 5033). Nous recommandons de procéder au réglage avec un objet peu réfléchissant.

La distance minimale (=y) pour l'élimination d'arrière-plan peut être calculée à partir du diagramme [illustration 25 ①] comme suit :

Exemple : x = 400 mm, y = 25 mm. C'est à dire que l'arrière-plan (blanc, 90 %) est masqué à partir d'une distance du capteur > 25 mm.

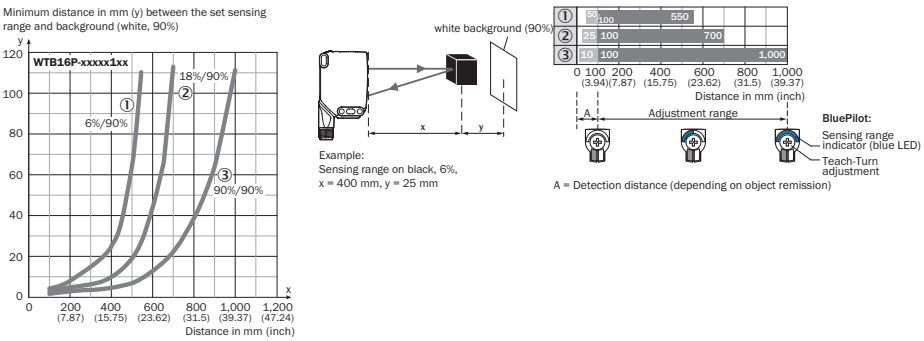


Illustration 25: Caractéristique 1, WTB16P Bluetooth-xxxxx1xx, lumière rouge

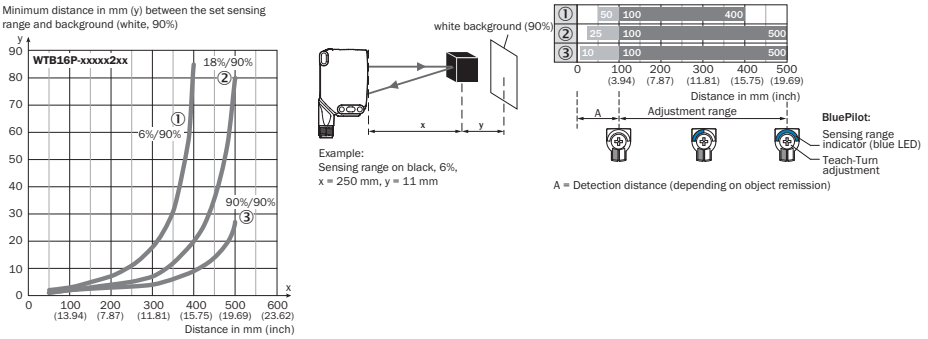


Illustration 26: Caractéristique 2, WTB16P Bluetooth-xxxxx2xx, lumière roue

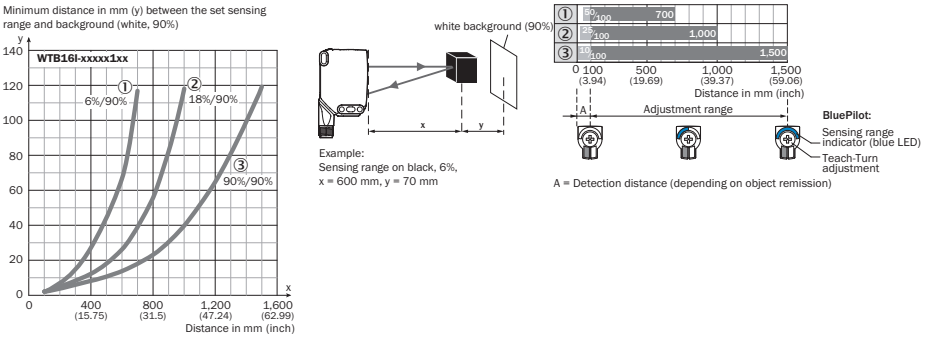


Illustration 27: Caractéristique 3, WTB16I Bluetooth-xxxxx1xx, lumière infra rouge

Réglage distance de commutation

WTB16x-xxxxxx2xAxx, avec bouton poussoir rotatif :
Appuyer sur le bouton d'apprentissage (pendant environ 1 à 3 secondes) pour régler la distance de commutation. Selon les exigences, il est possible de procéder à un réglage fin avec le potentiomètre (sans appuyer sur le bouton d'apprentissage).
Rotation vers la droite : augmentation de la distance de commutation.
Rotation vers la gauche : réduction de la distance de commutation.
La distance de commutation peut aussi être sélectionnée uniquement au moyen du potentiomètre. Nous recommandons de placer la distance de commutation dans l'objet, par ex. voir l'illustration 8. Après le réglage de la distance de commutation, extraire l'objet de la trajectoire du faisceau, ce qui élimine l'arrière-plan et modifie la sortie de commutation (tableau 5, tableau 6).

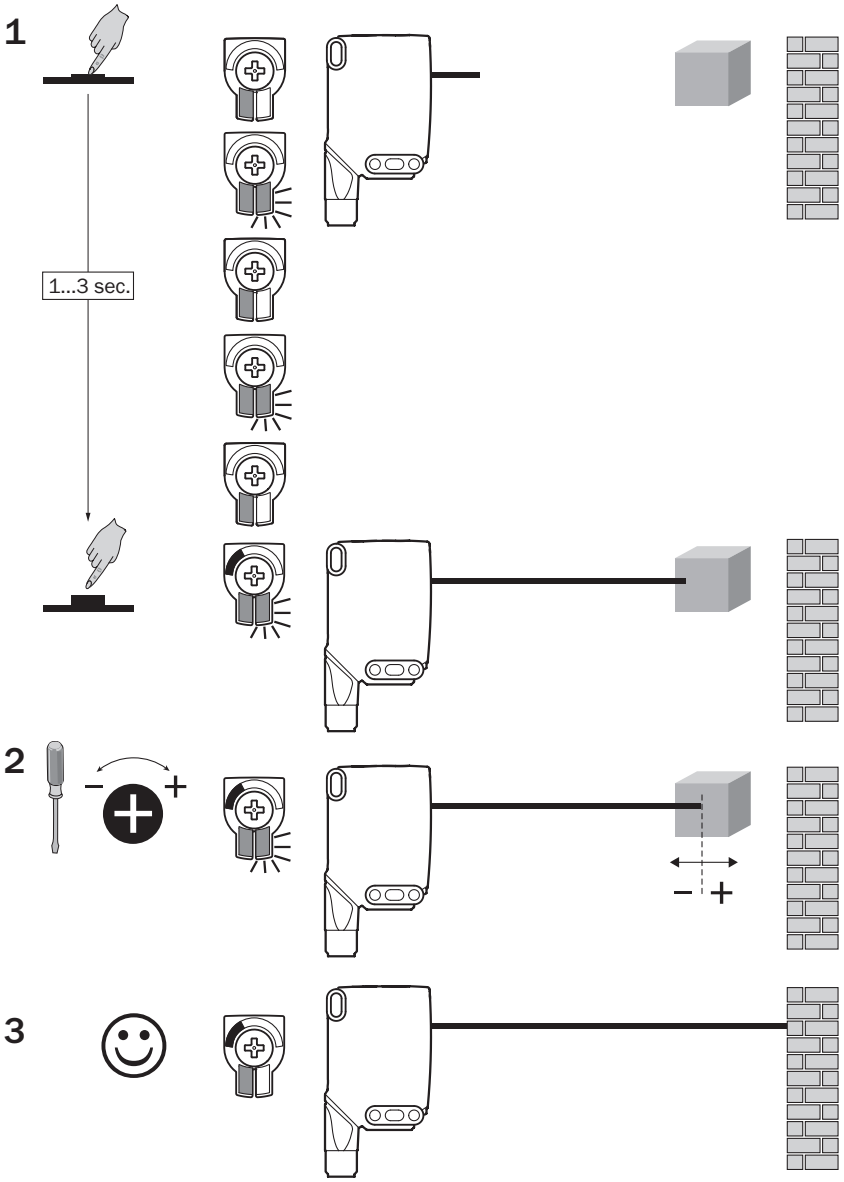


Illustration 28: WTB16x-xxxxxx2xAxx, réglage de la distance de commutation avec le bouton poussoir rotatif

WTB16x-xxxxxx1xAxx avec potentiomètre :
Le potentiomètre permet de régler la distance de commutation.
Rotation vers la droite : augmentation de la distance de commutation.
Rotation vers la gauche : réduction de la distance de commutation.
Nous recommandons de placer la distance de commutation dans l'objet, par ex. voir l'illustration 9. Après le réglage de la distance de commutation, extraire l'objet de la trajectoire du faisceau, ce qui élimine l'arrière-plan et modifie la sortie de commutation (tableau 5, tableau 6).

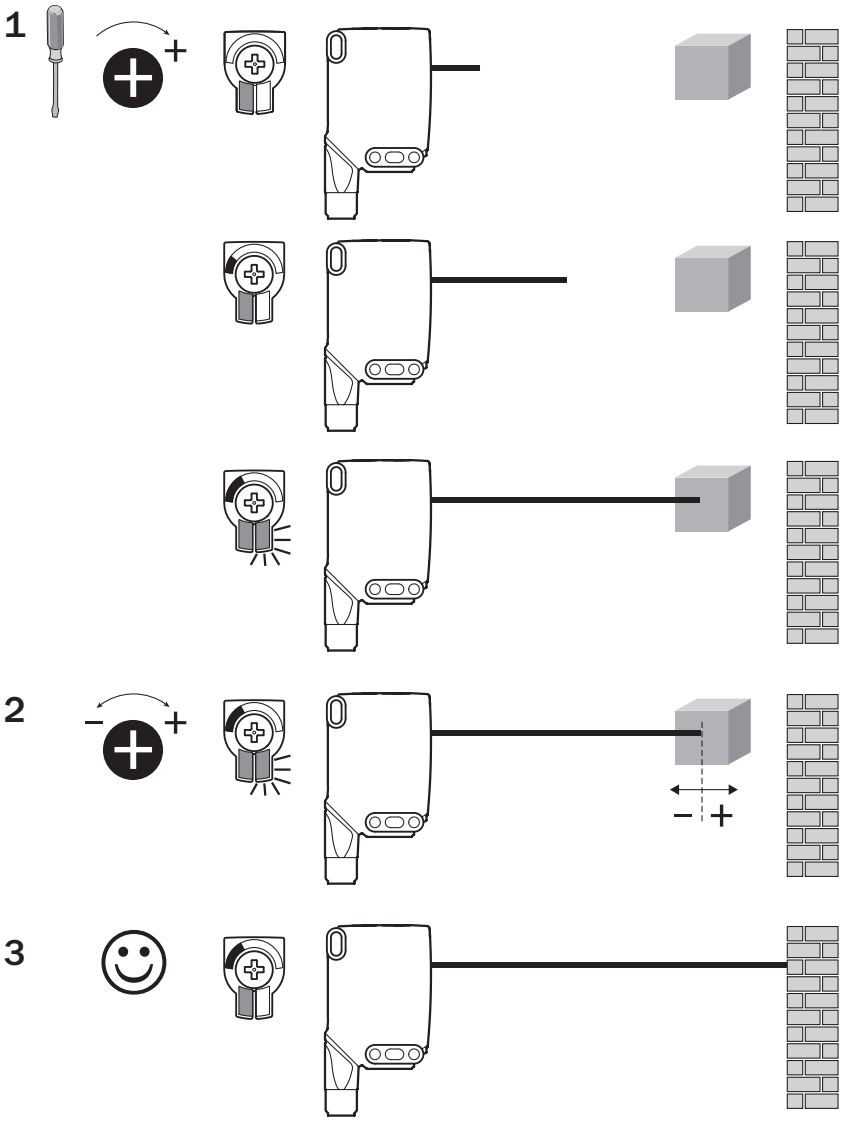


Illustration 29: WTB16x-xxxxxx1xAxx, réglage de la distance de détection avec le potentiomètre

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WTB16x, xxxxxx3xAxx, avec bouton d'apprentissage :
Appuyer sur le bouton d'apprentissage (pendant environ 1 à 3 secondes) pour régler la distance de commutation. Nous recommandons de placer la distance de commutation dans l'objet, par ex. voir l'illustration 10. Après le réglage de la distance de commutation, extraire l'objet de la trajectoire du faisceau, ce qui élimine l'arrière-plan et modifie la sortie de commutation (tableau 5, tableau 6).

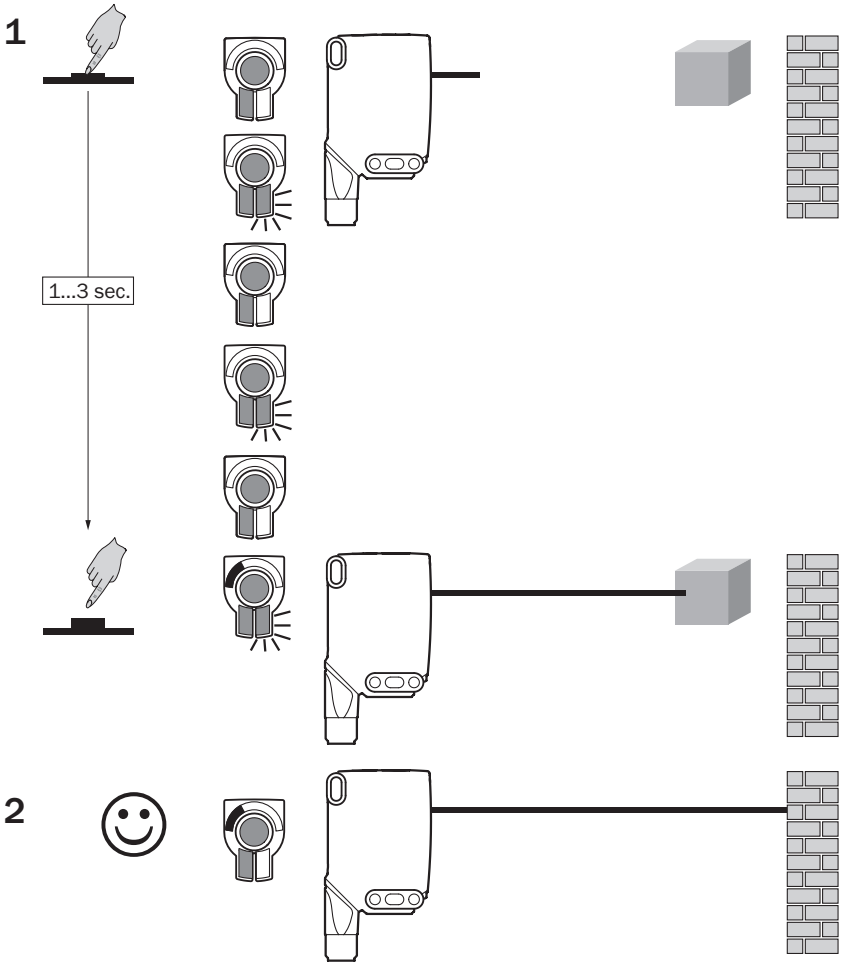

Illustration 30: WTB16x-xxxxxx3xAxx, réglage de la distance de commutation avec le bouton d'apprentissage

Structure des données de processus (version 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Données de processus	2 octets					4 octets
	Octet 0 : bit 15 ... 8 Octet 1 : bit 7 ... 0					Octet 0 : bit 31 ... 24 Octet 1 : bit 13 ... 16 Octet 2 : bit 15 ... 8 Octet 3 : bit 7 ... 0
Bit 0 / type de données	Q_{L1} / booléen					
Bit 1 / type de données	Q_{L2} / booléen			Qint.1 / booléen	Q_{L2} / booléen	Qint.1 / booléen
Bit... / description / type de données	2 ... 15 / [vide]	2 ... 15 / [valeur de mesure du temps] / UInt 14	2 ... 15 / [contre-valeur] / UInt 14	2 ... 15 / [longueur / mesure de la vitesse] / SInt14	2 / Qint. 1 / booléen	2 ... 7 / [vide]
Bit... / description / type de données					3 ... 15 / [valeur de mesure du temps] / UInt13	8 ... 31 / [charge support] / UInt 24

29 Élimination des défauts

Le tableau Élimination des défauts présente les mesures à appliquer si le capteur ne fonctionne plus.

LED d'état / image du défaut	Cause	Mesure
La LED verte clignote	Communication IO-Link	Aucune
Les sorties de commutation ne se comportent pas selon tableau 6	1. Communication IO-Link 2. Modification de la configuration 3. Court-circuit	1. Aucune 2. Adaptation de la configuration 3. Vérifier les raccordements électriques
La LED jaune s'allume, pas d'objet dans la trajectoire du faisceau	La distance de commutation est réglée sur une distance trop grande	Réduire la portée
L'objet est dans la trajectoire du faisceau, la LED jaune ne s'allume pas	La distance entre le capteur et l'objet est trop grande ou la portée est trop faible	Augmenter la portée
Le capteur n'apparaît pas dans SOPASair.	1. Connexion existante avec un autre appareil portatif. 2.L'appareil portatif se trouve en dehors de la zone d'émission du capteur. 3. Bluetooth LE désactivé dans le capteur.	1. Aucune connexion ou connexion existante désactivée. 2. Contrôle de la figure de montage (p. ex. blindage par du métal).

LED d'état / image du défaut	Cause	Mesure
	4. Bluetooth LE désactivé dans l'appareil portatif. 5. Filtre d'adresse MAC activé, appareil portatif non autorisé.	3. Activation de Bluetooth LE par SiLink2 Master ou IO-Link 4. Activation de Bluetooth LE 5. aucun filtre d'adresse MAC ou filtre d'adresse MAC modifié.
Impossible d'établir une connexion avec le capteur	1. La version Android / iOS ne satisfait pas aux exigences. 2. La version de SOPASair ne renferme pas le pilote nécessaire.	1. Contrôlez le système d'exploitation. 2. Désinstallez SOPASair et installez la dernière version de l'appli.

30 Démontage et mise au rebut

Le capteur doit être mis au rebut selon les régulations spécifiques au pays respectif. Dans la limite du possible, les matériaux du capteur doivent être recyclés (notamment les métaux précieux).

REMARQUE

Mise au rebut des batteries, des appareils électriques et électroniques

- Selon les directives internationales, les batteries, accumulateurs et appareils électriques et électroniques ne doivent pas être mis au rebut avec les ordures ménagères.
- Le propriétaire est obligé par la loi de retourner ces appareils à la fin de leur cycle de vie au point de collecte respectif.
-  Ce symbole sur le produit, son emballage ou dans ce document indique qu'un produit est soumis à ces régulations.

31 Maintenance

Les capteurs SICK ne nécessitent aucune maintenance.

Nous vous recommandons de procéder régulièrement

- au nettoyage des surfaces optiques
- au contrôle des vissages et des connexions enfichables

Ne procéder à aucune modification sur les appareils.

Sujet à modification sans préavis. Les caractéristiques du produit et techniques fournies ne sont pas une déclaration de garantie.

32 Homologations

32.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries**

Country	Comments
	Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

33 Caractéristiques techniques

33.1 Caractéristiques techniques

	WTB16P Bluetooth	WTB16I Bluetooth
Portée max.	10 mm ... 1.000 mm (type)[1]	10 mm ... 1.500 mm[1]
Diamètre spot / distance	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (type)	Ø 12 mm (800 mm)
Tension d'alimentation U_V	DC 10 ... 30 V	DC 10 ... 30 V
Consommation électrique	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Courant de sortie $I_{max.}$	≤ 100 mA	≤ 100 mA
Temps de réponse max.	500 µs[4]	500 µs[4]
Fréquence de commutation	1000 Hz[5]	1000 Hz[5]
Indice de protection	IP66, IP67	IP66, IP67
Classe de protection	III	III
Protections électriques	A, B, C, D[6]	A, B, C, D[6]
Température de service	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Objet avec 90 % de réémission (par rapport au blanc standard selon DIN 5033)
2 16 V CC ... 30 V CC, sans charge
3 10 V CC ... 16 V CC, sans charge
4 Durée du signal sur charge ohmique en mode commutation. Valeurs différentes possibles en mode COM2.
5 Pour un rapport clair/sombre de 1:1 en mode de commutation. Valeurs différentes possibles en mode IO-Link.
6 A = raccordements U_V protégés contre les inversions de polarité
B = entrées et sorties protégées contre les inversions de polarité
C = Suppression des impulsions parasites
D = sorties protégées contre les courts-circuits et les surcharges

33.2 Caractéristiques techniques Bluetooth®

Caractéristiques	Valeurs
Portée Bluetooth®	100 m à vue
Type de radio	BLE
Classe de radio	2
Fabricant module Bluetooth®	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
Bande RF	2402 à 2480 MHz
Puissance de sortie	2 dBM
Declaration ID	D033906
Qualified Design ID	89630
Nom spécification	4.1
Entreprise membre	SICK AG

MANUAL DE INSTRUÇÕES

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

Produto descrito

WTB16 - Bluetooth®

Fabricante

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Alemanha

Notas legais

Documento original

Este é um documento original da SICK AG.

Índice

34 Para a sua segurança

34.1 Instruções gerais de segurança

- Leia o manual de instruções antes de colocar em operação.
-  Conexão, montagem e configuração só podem ser realizadas por especialistas treinados.
-  Não é um componente de segurança em conformidade com a Diretriz de Máquinas da UE.
-  Ao colocar em operação, proteja o dispositivo de umidade e contaminação.
- Esse manual de instruções contém informações necessárias durante o ciclo de vida do sensor.

34.2 Indicações sobre a homologação UL

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

35 Especificações de uso

O WTB16 Bluetooth é um sensor fotoelétrico de proximidade utilizado para a detecção óptica, sem contato, de objetos, animais e pessoas. Qualquer utilização diferente ou alterações do produto ocasionam a perda da garantia da SICK AG.

36 Elementos de comando e indicação

Sensor fotoelétrico de reflexão com supressão do fundo

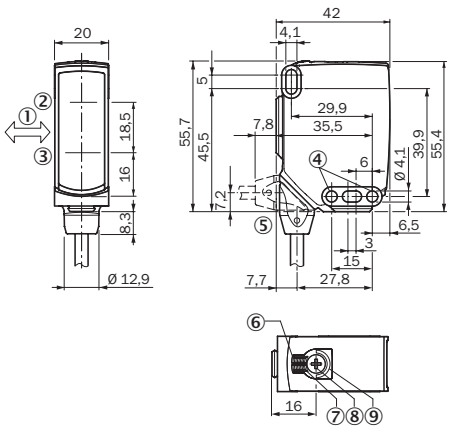

Figura 31: Desenho dimensional 1, cabo

① Direção preferencial do material a ser detectado

② Centro do eixo do sistema óptico, emissor

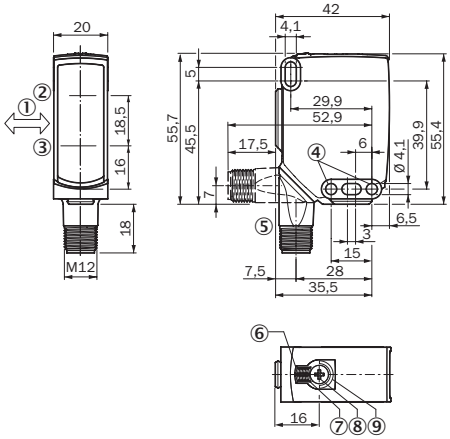

Figura 32: Desenho dimensional 2, conector macho

③ Centro do eixo do sistema óptico receptor
④ Furo de fixação, Ø4,1 mm
⑤ Conexão
⑥ LED indicador verde: tensão de alimentação ativa
⑦ Indicador LED amarelo: status recepção luminosa
⑧ Elemento de pressão e giro: configuração da distância de comutação
⑨ BluePilot azul: indicação da distância de comutação

37 Montagem

Montar o sensor e o refletor em uma cantoneira de fixação adequada (ver a linha de acessórios SICK).

Observar o torque de aperto máximo permitido de < 1,3 Nm para o sensor.

Vorzugsrichtung des Objektes zum Sensor beachten, ver figura 31, figura 32.

38 Instalação elétrica

A conexão dos sensores deve ser realizada em estado desenergizado (U_V = 0 V). Conforme o tipo de conexão, devem ser observadas as seguintes informações:

– Conector: observar a disposição dos pinos.
– Cabo: Cor dos fios

Instalar ou ligar a alimentação de tensão (U_V > 0 V) somente após a conexão de todas as conexões elétricas.

Explicações relativas ao esquema de conexões (tabela 7, tabela 8).

MF (configuração do pino 2) = entrada externa, Teach-in, sinal de comutação

Q_{L1}/C = saída de comutação, comunicação IO-Link

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Tabela 7: CC

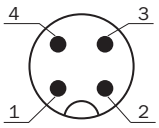
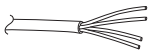
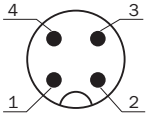
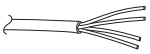
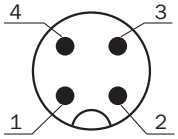
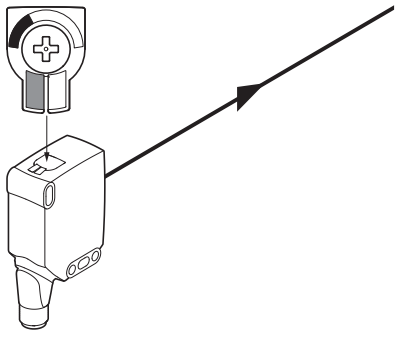
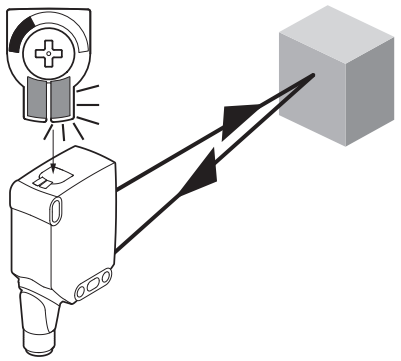
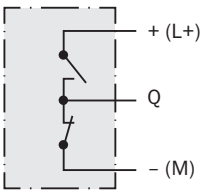
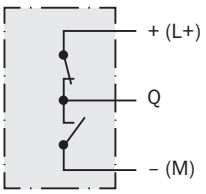
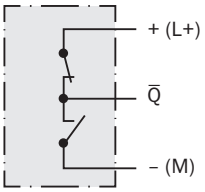
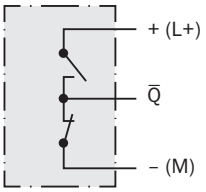
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Default: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
Default: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn (marrom) 2 = wht (branco) 3 = blu (azul) 4 = blk (preto)  0,14 mm² AWG26		1 = brn (marrom) 2 = wht (branco) 3 = blu (azul) 4 = blk (preto)  0,14 mm² AWG26	

Tabela 8: Push / Pull

		
Q push-pull (≤ 100 mA)		
$\overline{Q}$ push-pull (≤ 100 mA)		

39 Colocação em operação

O Bluetooth® é ligado na primeira colocação em operação. Você pode obter SOPASair na Google PlayStore (Android) e na App Store (iOS).
Requisitos para o sistema operativo: Android-Version 6.0, iOS versão mais atual.

1 **Alinhamento**

WTB16P Bluetooth® : alinhar o sensor ao objeto. Selecionar o posicionamento de forma que o feixe da luz de emissão vermelha incida sobre o centro do objeto. Certificar-se de que a abertura óptica (vidro frontal) do sensor esteja completamente livre [ver figura 33, figura 34].

WTB16I Bluetooth®: alinhar o sensor ao objeto. Selecionar o posicionamento de forma que a luz infravermelha (invisível) incida sobre o centro do objeto. O alinhamento correto só pode ser verificado através dos indicadores LED. ver figura 33, figura 34, ver tabela 7, tabela 8. Certificar-se de que a abertura óptica (vidro frontal) do sensor esteja completamente livre.

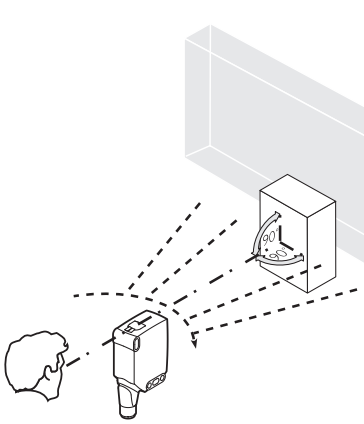


Figura 33: Alinhamento 1

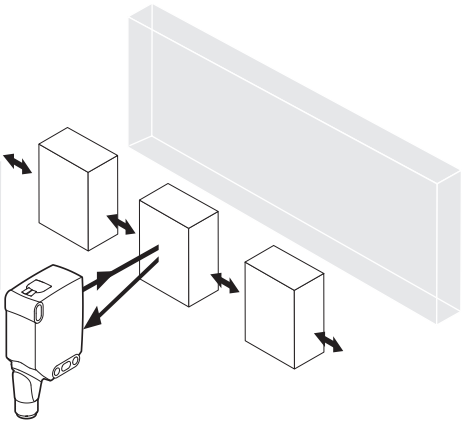


Figura 34: Alinhamento 2

2 **Distância de comutação**

Verificar as condições de uso: equiparar a distância de comutação e distância até o objeto ou plano de fundo, bem como a refletividade do objeto, com o respectivo diagrama [ver a figura 5 e 7] (x = distância de comutação, y = distância mínima entre a distância de comutação ajustada e o plano de fundo (branco, 90%)) luminescência: 6% = preto ①, 18% = cinza ②, 90% = branco ③ (com base no padrão branco da norma DIN 5033). Recomendamos efetuar o ajuste com um objeto de baixa luminescência.

A distância mínima (= y) para a supressão do fundo pode ser determinada com base no diagrama [figura 35 ①] como a seguir:

Exemplo: x = 400 mm, y = 25 mm. Isto significa, que o sensor suprime o plano de fundo (branco, 90%) a partir de uma distância > 25 mm.

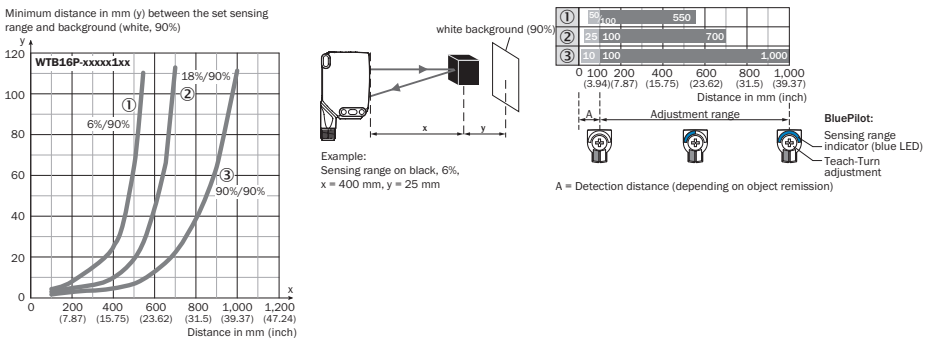


Figura 35: Curva característica 1, WTB16P Bluetooth--xxxxx1xx, luz vermelha

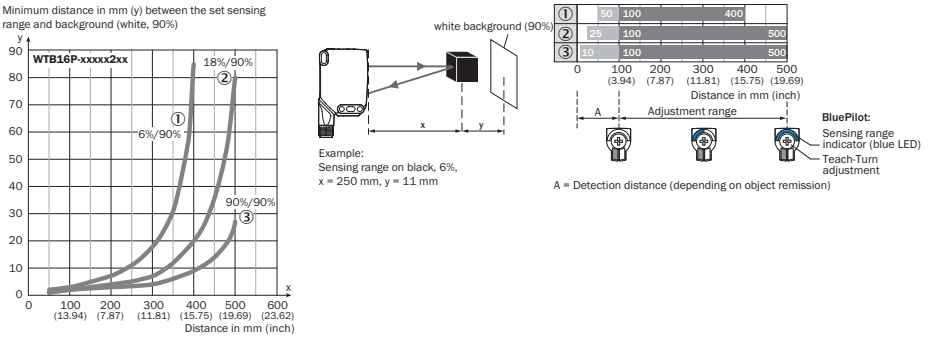


Figura 36: Curva característica 2, WTB16P Bluetooth- -xxxxx2xx, luz vermelha

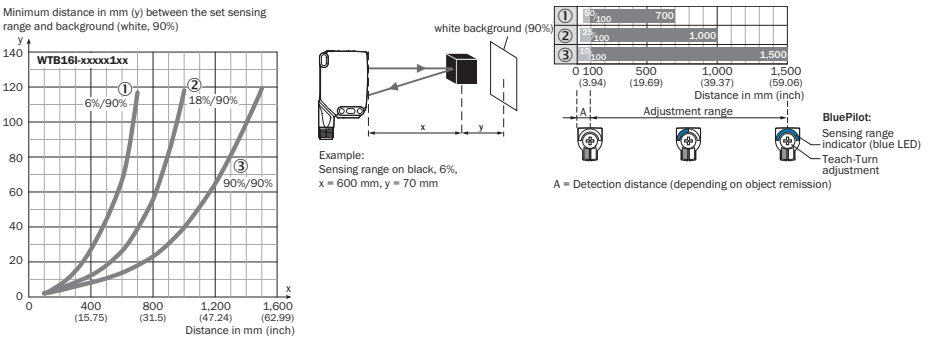


Figura 37: Curva característica 3, WTB16I Bluetooth- -xxxxx1xx, luz vermelha

Ajuste da distância de comutação

WTB16x-xxxxxx2xAxx com elemento de pressão e giro:
O ajuste da distância de comutação é efetuado com a pressão da tecla Teach-in (aprox. 1-3 seg.). Dependendo dos requisitos, é possível fazer um ajuste fino com o potenciômetro (sem apertar a tecla teach-in).
Giro para direita: aumento da distância de comutação.
Giro para esquerda: redução da distância de comutação.
A distância de comutação também pode ser ajustada somente com o potenciômetro.
Recomendamos posicionar a distância de comutação no objeto, por ex., ver a figura 8.
Após o ajuste da distância de comutação, remover o objeto do caminho óptico; o fundo é suprimido e a saída de comutação se altera (tabela 7, ver tabela 8, página 51).

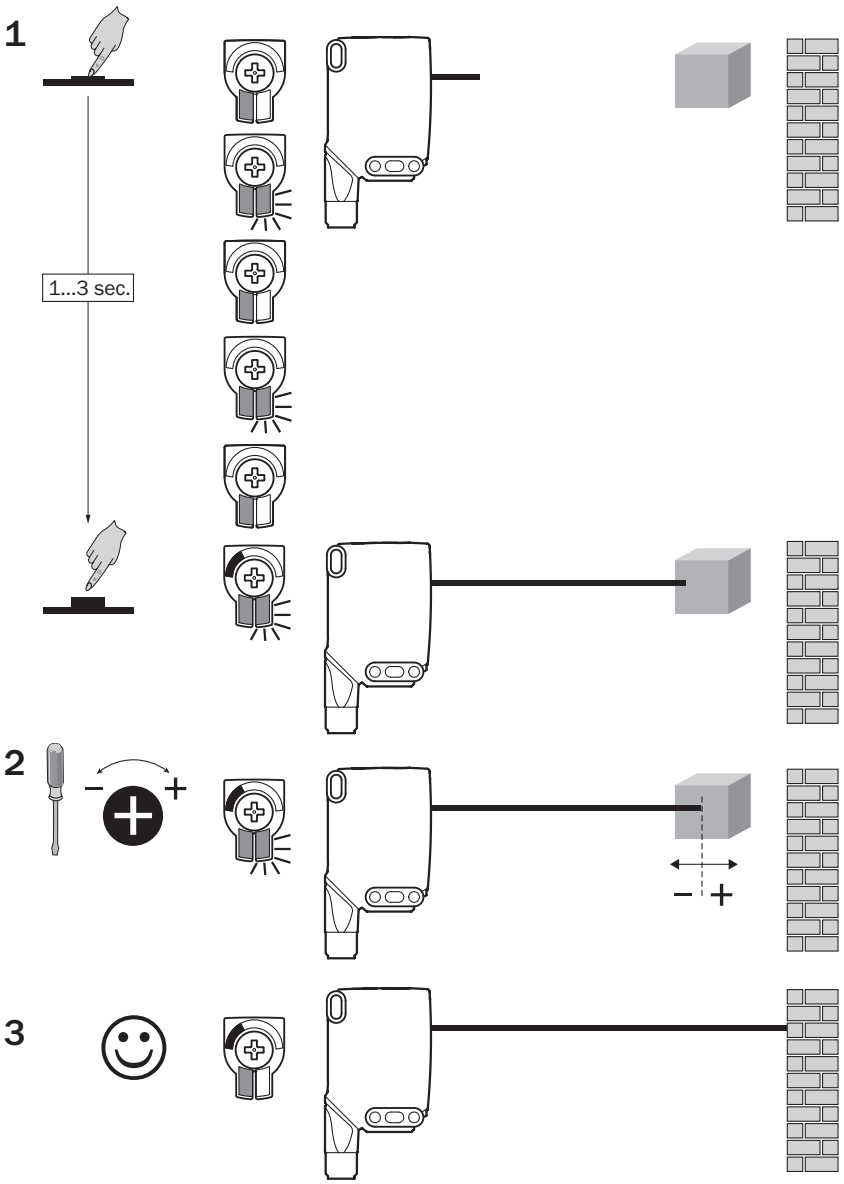


Figura 38: WTB16x-xxxxxx2xAxx, ajuste da distância de comutação com elemento de pressão e giro

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WTB16x-xxxxxx1xAxx com potenciômetro:
O potenciômetro permite o ajuste da distância de comutação.
Giro para direita: aumento da distância de comutação.
Giro para esquerda: redução da distância de comutação.
Recomendamos posicionar a distância de comutação no objeto, por ex., ver a figura 9.
Após o ajuste da distância de comutação, remover o objeto do caminho óptico; o fundo é suprimido e a saída de comutação se altera (tabela 7, ver tabela 8, página 51).

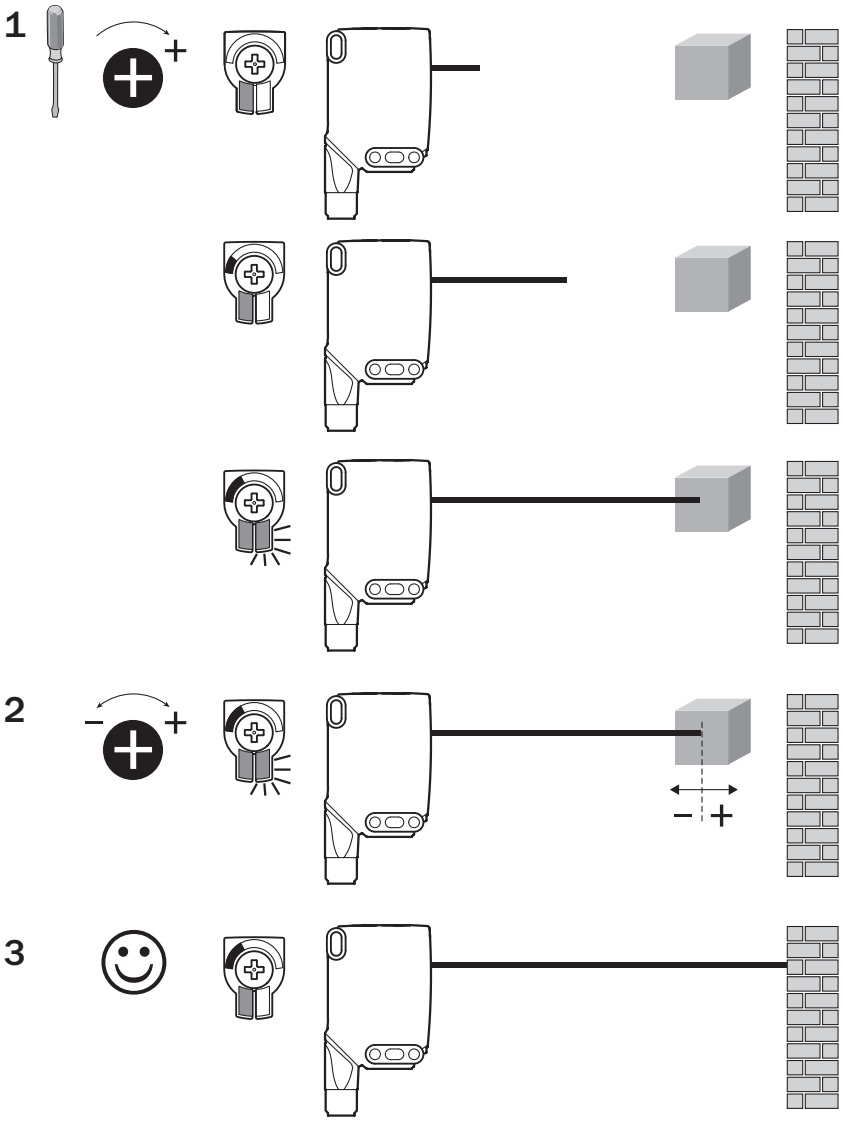

Figura 39: WTB16x-xxxxxx1xAxx, ajuste da distância de comutação com potenciômetro

WTB16x-xxxxxx3xAxx com tecla teach-in:
O ajuste da distância de comutação é efetuado com a pressão da tecla Teach-in (aprox. 1-3 seg.). Recomendamos posicionar a distância de comutação no objeto, por ex., ver a figura 10. Após o ajuste da distância de comutação, remover o objeto do caminho óptico; o fundo é suprimido e a saída de comutação se altera (tabela 7, ver tabela 8, página 51).

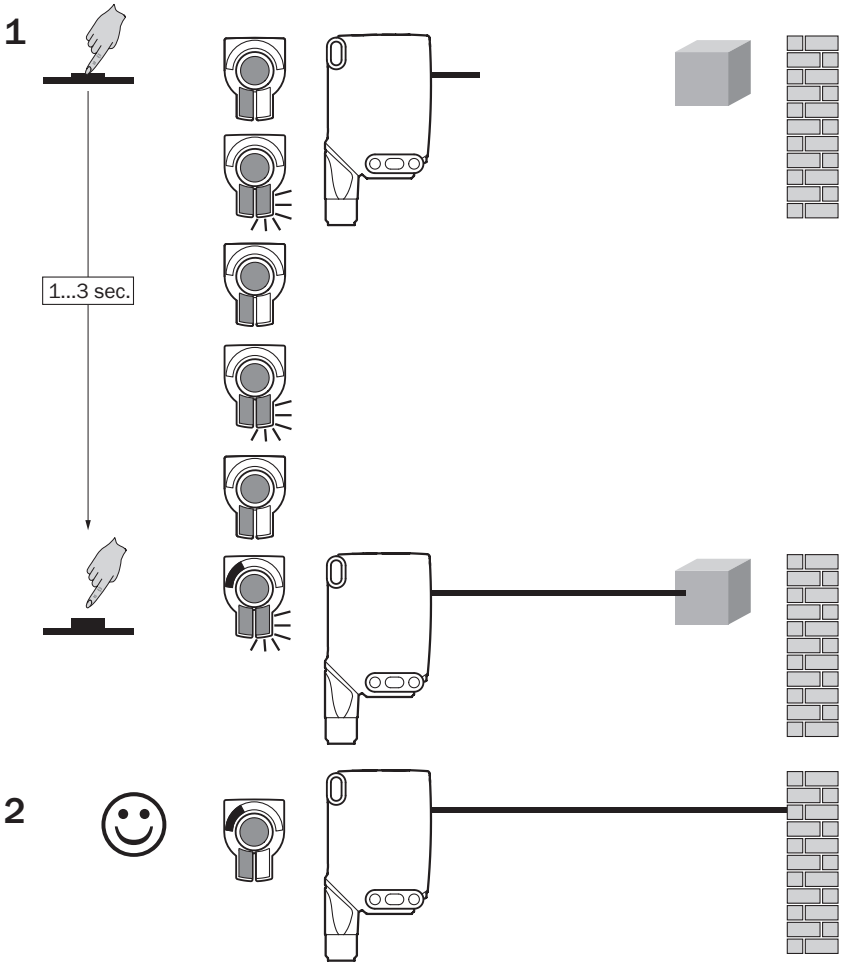

Figura 40: WTB16x-xxxxxx3xAxx, ajuste da distância de comutação com tecla teach-in

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Process data structure (Version 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Process data	2 Byte					4 Byte
	Byte 0 : Bit 15... 8 Byte 1: Bit 7... 0					Byte 0 : Bit 31... 24 Byte 1: Bit 13... 16 Byte 2: Bit 15... 8 Byte 3: Bit 7... 0
Bit 0/ Data type	Q_{L1} / Boolean					
Bit 1/ Data type	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Bit... / Description / Data type	2...15 / [empty]	2...15 / [Time measurement value] / UInt 14	2 ... 15 / [Counter value] / UInt 14	2 ... 15 / [Length / speed measurement] / SInt14	2 / Qint. 1 / Boolean	2...7 / [empty]
Bit... / Description / Data type					3 ... 15 / [Time measurement value] / UInt13	8 ... 31 / [Carrier load] / UInt 24

40 Eliminação de falhas

A tabela Eliminação de falhas mostra as medidas a serem executadas, quando o sensor não estiver funcionando.

Indicador LED / padrão de erro	Causa	Medida
LED verde intermitente	Comunicação IO-Link	Nenhuma
As saídas de comutação não se comportam de acordo com a tabela 8	1. Comunicação IO-Link 2. Alteração da configuração 3. Curto-circuito	1. Nenhuma 2. Adaptação da configuração 3. Verificar as conexões elétricas
LED amarelo aceso, nenhum objeto no caminho óptico	A distância de comutação é ajustada com uma distância grande demais	Reduzir a distância de comutação
Objeto está no caminho óptico, LED amarelo apagado	Distância entre sensor e objeto é grande demais ou distância de comutação foi ajustada para um valor baixo demais	Aumentar a distância de comutação
No SOPASair, o sensor não é mostrado	1. Há uma conexão com um outro dispositivo portátil. 2.O dispositivo portátil se encontra fora da área de transmissão do sensor. 3. Bluetooth LE no sensor está desativado.	1. ausência ou desativação da conexão existente. 2. Verificação da situação de montagem (p.ex. blindagem por metal). 3. Ativação do Bluetooth LE por SiLink2 Master ou IO-Link 4. Ativação do Bluetooth LE

Indicador LED / padrão de erro	Causa	Medida
	4. Bluetooth LE no dispositivo portátil está desativado. 5. Filtro de endereço MAC ativado, dispositivo portátil não autorizado.	5. ausência ou modificação do filtro MAC-Adress.
Não é possível estabelecer uma conexão com o sensor	1. A versão Android ou iOS não corresponde aos requisitos. 2. A versão SOPASair não contém o driver necessário.	1. Verifique o sistema operativo. 2. Desinstale Sie SOPASair, instale a atual versão App.

41 Desmontagem e descarte

O sensor deve ser descartado de acordo com os regulamentos específicos por país aplicáveis. Deve-se realizar um esforço durante o processo de descarte para reciclar os materiais constituintes (particularmente metais preciosos).

NOTA

Descarte de pilhas e dispositivos elétricos e eletrônicos

- De acordo com diretrizes internacionais, pilhas, acumuladores e dispositivos elétricos ou eletrônicos não devem ser descartados junto do lixo comum.
- O proprietário é obrigado por lei a retornar esses dispositivos ao fim de sua vida útil para os pontos de coleta públicos respectivos.
-  Este símbolo sobre o produto, seu pacote o neste documento, indica que um produto está sujeito a esses regulamentos.

42 Manutenção

Os sensores SICK não requerem manutenção.

Recomendamos que se efetue em intervalos regulares

- uma limpeza das superfícies ópticas
- uma verificação das conexões roscadas e dos conectores

Não são permitidas modificações no aparelho.

Sujeito a alterações sem aviso prévio. As propriedades do produto e os dados técnicos especificados não constituem nenhum certificado de garantia.

43 Homologações

43.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries** Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Nether-

Country	Comments
	lands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence--exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

44 Dados técnicos

44.1 Dados técnicos

	WTB16P Bluetooth	WTB16I Bluetooth
Distância de comutação máx.	10 mm ... 1.000 mm (tipo)[1]	10 mm ... 1.500 mm[1]
Diâmetro do ponto de luz/distância	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (tipo)	Ø 12 mm (800 mm)
Tensão de alimentação U_V	DC 10 ... 30 V	DC 10 ... 30 V
Consumo de corrente	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Corrente de saída $I_{max.}$	≤ 100 mA	≤ 100 mA
Tempo máx. de resposta	500 µs[4]	500 µs[4]
Frequência de comutação	1000 Hz[5]	1000 Hz[5]
Tipo de proteção	IP66, IP67	IP66, IP67
Classe de proteção	III	III
Circuitos de proteção	A, B, C, D[6]	A, B, C, D[6]
Temperatura ambiente de funcionamento	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Objeto a ser detectado com 90% de luminância (com base no padrão branco DIN 5033)
2 16VCC...30VCC, sem carga
3 10VCC...16VCC, sem carga
4 Tempo de duração do sinal em carga ôhmica no modo de comutação. Valores diferentes possíveis no modo COM2.
5 Na proporção claro-escuro 1:1 no modo de comutação. Valores diferentes possíveis no modo IO-Link.
6 A = conexões protegidas contra inversão de pólos U_V
B = Entradas e saídas protegidas contra polaridade inversa
C = Supressão de impulsos parasitas
D = Saídas protegidas contra sobrecorrente e curto-circuito

44.2 Dados técnicos do Bluetooth®

Características	Valores
Bluetooth® alcance	100 m na vista
Tipo de transmissão	BLE
Classe de transmissão	2
Fabricante módulo Bluetooth®	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
Banda RF	2402 - 2480 MHz
Potência de saída	2 dBM
Declaration ID	D033906
Qualified Design ID	89630
Specification Name	4.1
Empresa associada	SICK AG

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ISTRUZIONI PER L'USO

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

Descrizione prodotto

WTB16 - Bluetooth®

Produttore

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Germania

Note legali

Questo manuale è protetto dai diritti d'autore. I diritti che ne conseguono rimangono alla ditta SICK. Il manuale o parti di esso possono essere fotocopiati esclusivamente entro i limiti previsti dalle disposizioni di legge in materia di diritti d'autore. Non è consentito modificare, abbreviare o tradurre il presente manuale senza previa autorizzazione scritta della ditta SICK AG.

I marchi riportati nel presente manuale sono di proprietà del rispettivo proprietario.

Documento originale

Questo documento è un originale della ditta SICK AG.

Indice

45 Norme di sicurezza

45.1 Avvertenze di sicurezza generali

- Prima di eseguire la messa in servizio, leggere le istruzioni per l'uso.
-  Il collegamento, il montaggio e la configurazione devono essere eseguiti esclusivamente da personale tecnico qualificato.
-  Non è un componente di sicurezza ai sensi della Direttiva Macchine UE.
-  Durante la messa in servizio, proteggere il dispositivo dall'umidità e da possibili contaminazioni.
- Le presenti Istruzioni per l'uso contengono informazioni necessarie durante il ciclo di vita del sensore.

45.2 Indicazioni sull'omologazione UL

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

46 Uso conforme alle disposizioni

WTB16 Bluetooth è un sensore fotoelettrico energetico (di seguito detto sensore) utilizzato per il rilevamento ottico senza contatto di oggetti, animali e persone. Se viene utilizzato diversamente e in caso di modifiche del prodotto, decade qualsiasi diritto alla garanzia nei confronti di SICK.

47 Elementi di comando e di visualizzazione

Sensore fotoelettrico energetico con soppressione di sfondo.

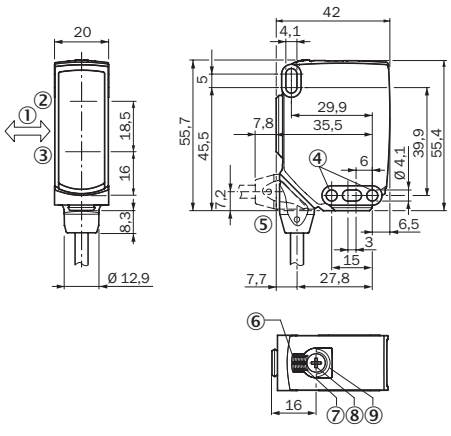


Figura 41: Disegno quotato 1, cavo

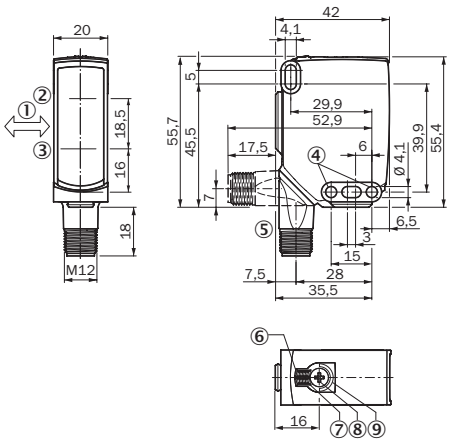


Figura 42: Disegno quotato 2, connettore maschio

① Direzione preferenziale dell'oggetto

② Centro asse ottico trasmettitore

③ Centro asse ottico ricevitore
④ Foro di fissaggio, Ø4,1 mm
⑤ Collegamento
⑥ Indicatore LED verde: tensione di alimentazione attiva
⑦ Indicatore LED giallo: stato ricezione luce
⑧ Elemento a pressione-rotazione: impostazione della distanza di lavoro
⑨ BluePilot blu: visualizzazione distanza di lavoro

48 Montaggio

Montare il sensore su una staffa di fissaggio adatta (vedi il programma per accessori SICK).

Rispettare la coppia di serraggio massima consentita del sensore di < 1,3 Nm.

Vorzugsrichtung des Objektes zum Sensor beachten, v. figura 41, figura 42.

49 Installazione elettrica

Il collegamento dei sensori deve avvenire in assenza di tensione (U_V = 0 V). In base al tipo di collegamento si devono rispettare le seguenti informazioni:

– Collegamento a spina: osservare la configurazione dei pin.
– Cavo: colore filo

Solamente in seguito alla conclusione di tutti i collegamenti elettrici, ripristinare o accendere l'alimentazione elettrica (U_V > 0 V).

Spiegazioni dello schema di collegamento (tabella 9, tabella 10).

MF (configurazione pin 2) = ingresso esterno, teach-in, segnale di commutazione

Q_{L1}/C = uscita di commutazione, comunicazione IO-Link

Tabella 9: DC

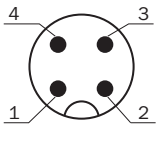
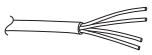
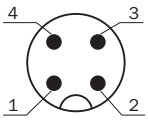
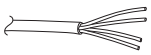
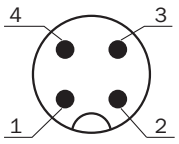
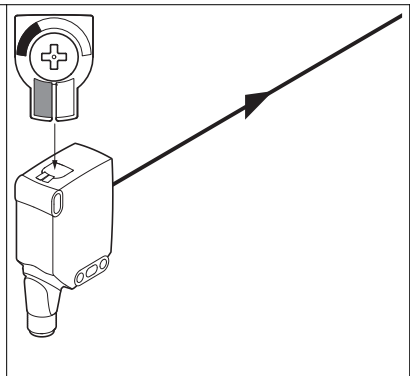
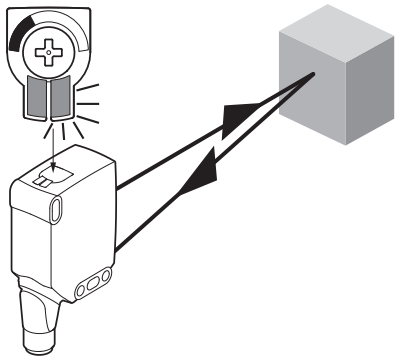
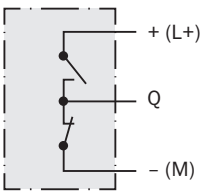
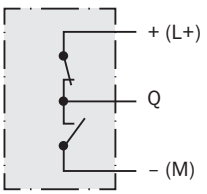
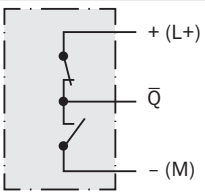
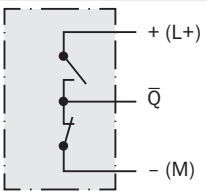
WTB16	-24161xxxA00 -34161xxxA00	-1x161x- xxA00	-24162x- xxA00 -34162x- xxA00	-1x162x- xxA00	-2416xxxxA01- A99 -3416xxxxA01- A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Default: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
Default: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn 2 = wht 3 = blu 4 = blk  0,14 mm² AWG26		1 = brn 2 = wht 3 = blu 4 = blk  0,14 mm² AWG26	

Tabella 10: Push/Pull

		
Q push-pull (≤ 100 mA)		
$\overline{Q}$ push-pull (≤ 100 mA)		

50 Messa in servizio

Bluetooth® è acceso alla prima messa in servizio. SOPASair è disponibile in Google PlayStore (Android) e in App Store (iOS).
Requisiti del sistema operativo: versione Android 6.0, versione iOS più recente.

1 **Orientamento**

WTB16P Bluetooth® : orientare il sensore sul rispettivo oggetto. Scegliere la posizione in modo tale che il raggio di luce rosso emesso colpisca il centro dell'oggetto. Accertarsi che l'apertura ottica del sensore (frontalino) sia completamente libera [v. figura 43, figura 44].
WTB16I Bluetooth®: orientare il sensore sul rispettivo oggetto. Scegliere la posizione in modo tale che la luce infrarossa (non visibile) colpisca il centro dell'oggetto. L'orientamento corretto può essere rilevato solo tramite l'indicatore LED. v. figura 43,figura 44, v. tabella 9, tabella 10. Si deve fare attenzione che l'apertura ottica del sensore (frontalino) sia completamente libera.

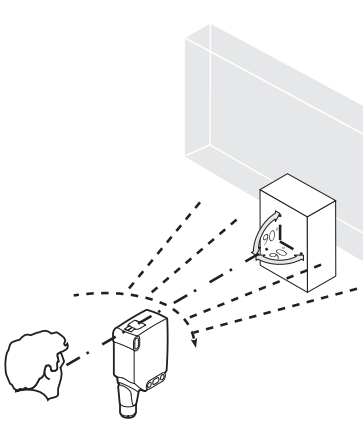


Figura 43: Orientamento 1

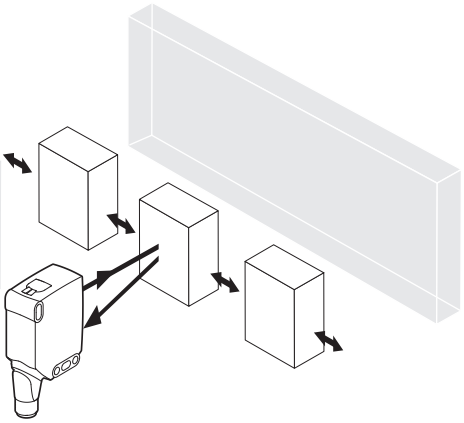


Figura 44: Orientamento 2

2 **Distanza di lavoro**

Controllare le condizioni d'impiego: bilanciare distanza di lavoro e distanza dall'oggetto ossia dallo sfondo e coefficiente di riflessione dell'oggetto con il diagramma corrispondente [vedere immagini 5 e 7] (x= distanza di lavoro, y = distanza minima tra distanza di lavoro impostata e sfondo (bianco, 90%)), coefficiente di riflessione 6% = nero ①, 18% = grigio ②, 90% = bianco ③ (con riferimento al bianco standard secondo DIN 5033). Si consiglia di effettuare l'impostazione con un oggetto con basso coefficiente di riflessione.
La distanza minima (= y) per la soppressione dello sfondo può venire rilevata dal diagramma [figura 45 ①] come segue:
Esempio: x = 400 mm, y = 25 mm. Questo significa che lo sfondo (bianco 90%) viene soppresso a partire da una distanza > 25 mm dal sensore.

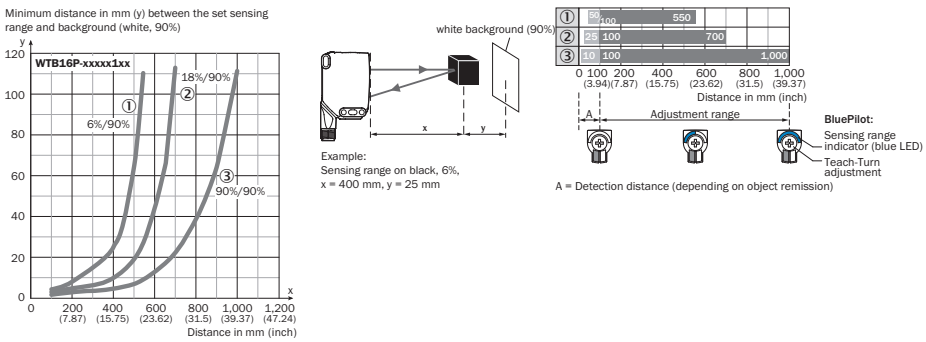


Figura 45: Linea caratteristica 1, WTB16P Bluetooth-xxxxx1xx, luce rossa

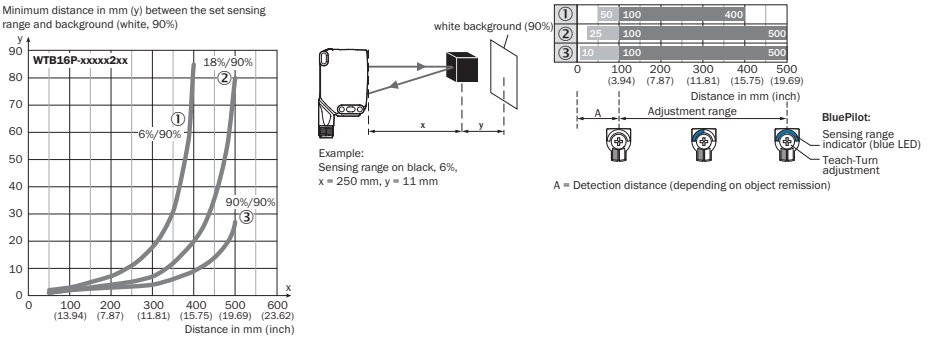


Figura 46: Linea caratteristica 2, WTB16P Bluetooth-xxxxx2xx, luce rossa

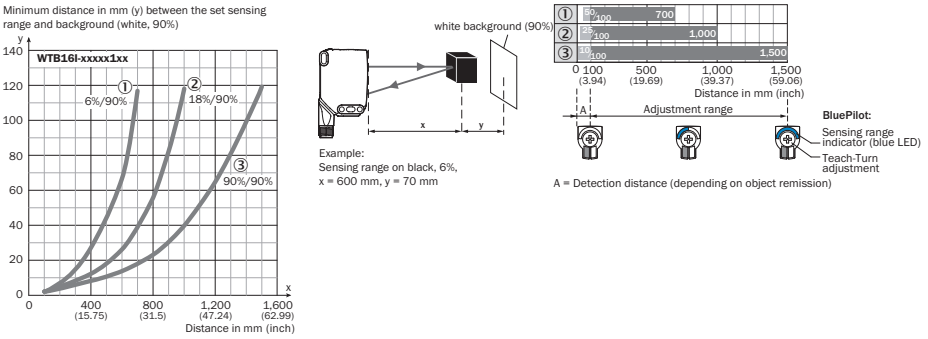


Figura 47: Linea caratteristica 3, WTB16I Bluetooth-xxxxx1xx, luce infrarossa

Regolazione distanza di lavoro

WTB16x-xxxxxx2xAxx con elemento a pressione-rotazione:
Premendo il pulsante teach-in (circa 1-3 sec.) viene impostata la distanza di lavoro. A seconda delle esigenze, con il potenziometro (senza premere il pulsante teach-in) è possibile eseguire un'impostazione di precisione.
Rotazione verso destra: aumento della distanza di lavoro.
Rotazione verso sinistra: riduzione della distanza di lavoro.
La distanza di lavoro può anche essere impostata unicamente con il potenziometro. Si consiglia di inserire nell'oggetto la distanza di lavoro, ad es. vedere l'immagine 8. Dopo aver impostato la distanza di lavoro, allontanare l'oggetto dalla traiettoria del raggio; lo sfondo viene quindi soppresso e l'uscita di commutazione cambia (tabella 9, tabella 10).

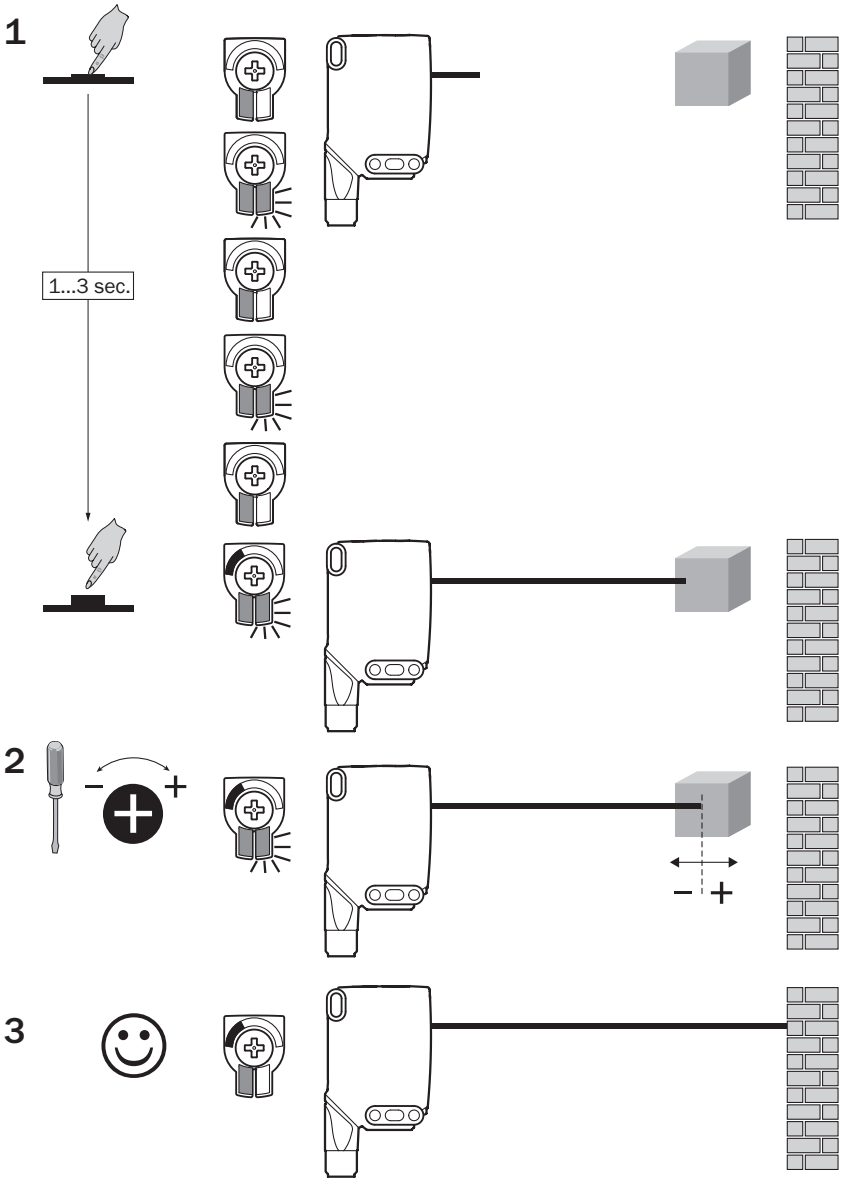


Figura 48: WTB16x-xxxxxx2xAxx, impostazione della distanza di lavoro con l'elemento a pressione-rotazione

WTB16x-xxxxxx1xAxx con potenziometro:
Con il potenziometro viene impostata la distanza di lavoro.
Rotazione verso destra: aumento della distanza di lavoro.
Rotazione verso sinistra: riduzione della distanza di lavoro.
Si consiglia di inserire nell'oggetto la distanza di lavoro, ad es. vedere l'immagine 9.
Dopo aver impostato la distanza di lavoro, allontanare l'oggetto dalla traiettoria del raggio; lo sfondo viene quindi soppresso e l'uscita di commutazione cambia (tabella 9, tabella 10).

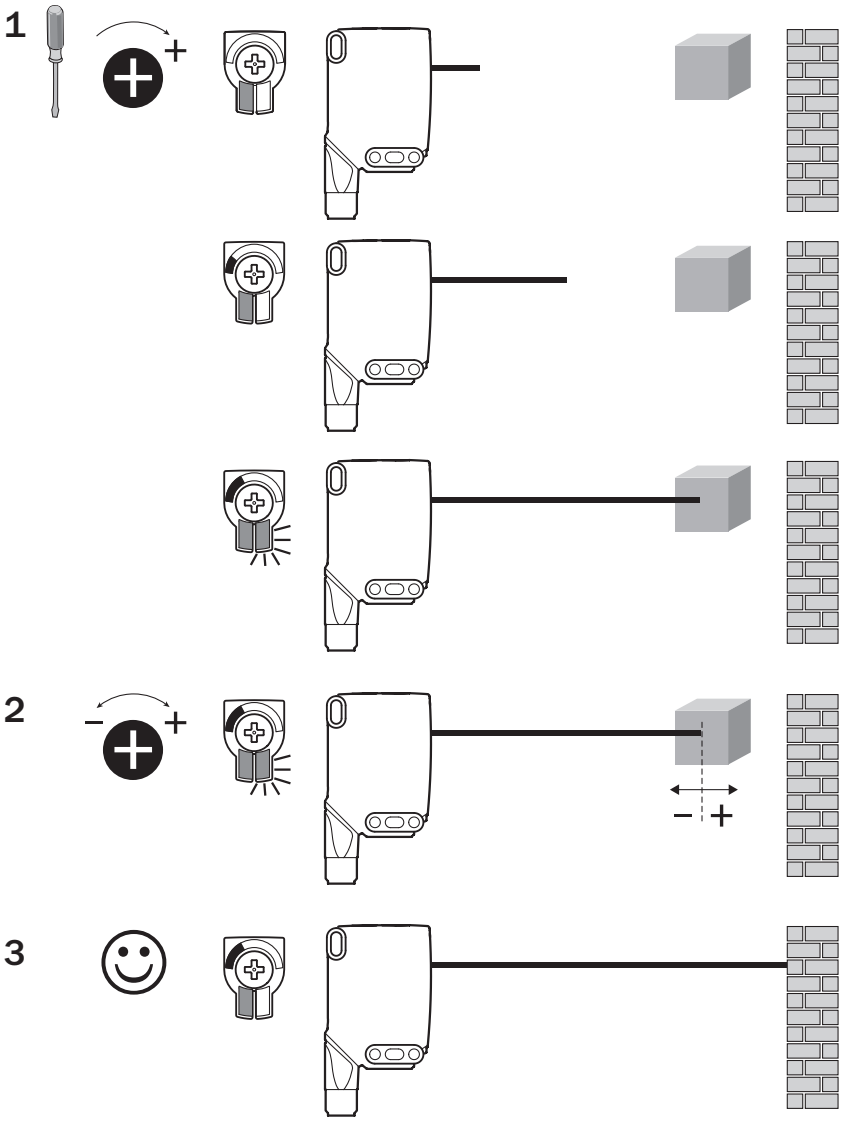


Figura 49: WTB16x-xxxxxx1xAxx, impostazione della distanza di lavoro con il potenziometro

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WTB16x-xxxxxx3xAxx con pulsante teach-in:
Premendo il pulsante teach-in (circa 1-3 sec.) viene impostata la distanza di lavoro. Si consiglia di inserire nell'oggetto la distanza di lavoro, ad es. vedere l'immagine 10. Dopo aver impostato la distanza di lavoro, allontanare l'oggetto dalla traiettoria del raggio; lo sfondo viene quindi soppresso e l'uscita di commutazione cambia (tabella 9, tabella 10).

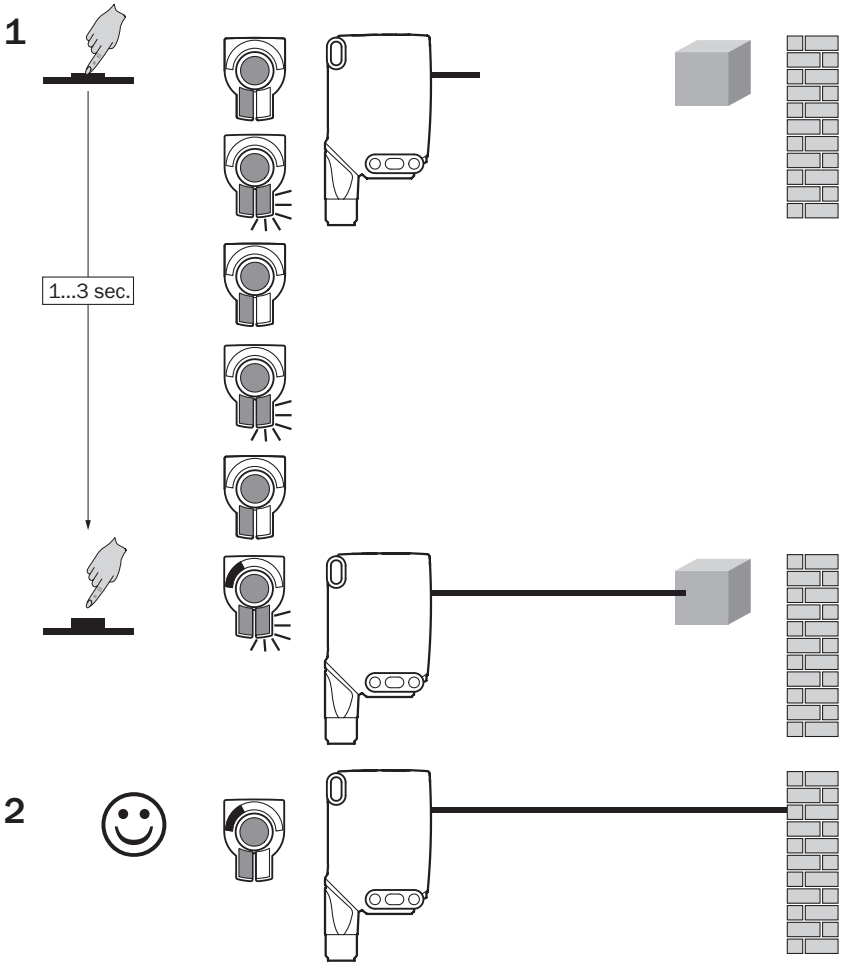

Figura 50: WTB16x-xxxxxx3xAxx, impostazione della distanza di lavoro con il pulsante teach-in

Struttura dati di processo (versione 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Process data	2 byte					4 byte
	Byte 0 : bit 15... 8 Byte 1: bit 7... 0					Byte 0: bit 31... 24 Byte 1: bit 13... 16 Byte 2: bit 15... 8 Byte 3: bit 7... 0
Bit 0/ Data type	Q_{L1} / Boolean					
Bit 1/ Data type	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Bit... / Description / Data type	2...15 / [empty]	2...15 / [Time measurement value] / UInt 14	2 ... 15 / [Counter value] / UInt 14	2 ... 15 / [Length / speed measurement] / SInt14	2 / Qint. 1 / Boolean	2...7 / [empty]
Bit... / Description / Data type					3 ... 15 / [Time measurement value] / UInt13	8 ... 31 / [Carrier load] / UInt 24

51 Eliminazione difetti

La tabella di rimozione dei disturbi mostra quali provvedimenti si devono adottare quando il sensore non funziona più.

Indicatore LED / figura di errore	Causa	Provvedimento
Il LED verde lampeggia	Comunicazione IO-Link	Nessuno
Le uscite di commutazione non si comportano conformemente alle tabella 10	1. Comunicazione IO-Link 2. Modifica della configurazione 3. Corto circuito	1. Nessuno 2. Adattamento della configurazione 3. Controllare i collegamenti elettrici
il LED giallo si accende, nessun oggetto nella traiettoria del raggio	La distanza di lavoro è impostata a una distanza eccessiva	Diminuire la distanza di commutazione
L'oggetto è nella traiettoria del raggio, il LED giallo non si accende	La distanza tra sensore e oggetto è troppo grande o la distanza di commutazione ha un'impostazione troppo bassa	Aumentare la distanza di commutazione
In SOPASair il sensore non viene visualizzato	1. Esiste un collegamento con un altro handheld. 2.Handheld esterno al campo di emissione del sensore. 3. Bluetooth LE disattivato nel sensore. 4. Bluetooth LE disattivato nell'handheld.	1. Nessun collegamento o disattivazione del collegamento esistente. 2. Verifica della condizione di montaggio (ad es. schermo mediante metallo). 3. Attivazione di Bluetooth LE tramite master SiLink2 o IO-Link

Indicatore LED / figura di errore	Causa	Provvedimento
	5. Filtro di indirizzo MAC attivato, handheld non autorizzato.	4. Attivazione di Bluetooth LE 5. Nessuna modifica del filtro di indirizzo MAC.
Non può essere effettuato alcun collegamento con il sensore	1. La versione Android o iOS non corrisponde ai requisiti. 2. La versione SOPASair non contiene il driver necessario.	1. Controllare il sistema operativo. 2. Disinstallare SOPASair, installare la versione App più recente.

52 Smontaggio e smaltimento

Il sensore deve essere smaltito in conformità con le leggi nazionali vigenti in materia. Durante il processo di smaltimento, riciclare se possibile i materiali che compongono il sensore (in particolare i metalli nobili).

INDICAZIONE

Smaltimento di batterie, dispositivi elettrici ed elettronici

- In base a direttive internazionali, le batterie, gli accumulatori e i dispositivi elettrici ed elettronici non devono essere smaltiti tra i rifiuti generici.
- Il titolare è tenuto per legge a riconsegnare questi dispositivi alla fine del loro ciclo di vita presso i rispettivi punti di raccolta pubblici.
-  Questo simbolo presente sul prodotto, nella sua confezione o nel presente documento, indica che un prodotto è soggetto a tali regolamentazioni.

53 Manutenzione

I sensori SICK sono esenti da manutenzione.

A intervalli regolari si consiglia di

- pulire le superfici limite ottiche
- Verificare i collegamenti a vite e gli innesti a spina

Non è consentito effettuare modifiche agli apparecchi.

Contenuti soggetti a modifiche senza preavviso. Le proprietà del prodotto e le schede tecniche indicate non costituiscono una dichiarazione di garanzia.

54 Autorizzazioni

54.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries** Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO),

Country	Comments
	Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

55 Dati tecnici

55.1 Dati tecnici

	WTB16P Bluetooth	WTB16I Bluetooth
Distanza max. di commutazione	10 mm ... 1.000 mm (tipo)[1]	10 mm ... 1.500 mm[1]
Diametro punto luminoso/distanza	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (tipo)	Ø 12 mm (800 mm)
Tensione di alimentazione U_V	DC 10 ... 30 V	DC 10 ... 30 V
Consumo di corrente	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Corrente di uscita $I_{max.}$	≤ 100 mA	≤ 100 mA
Tempo di reazione max.	500 µs[4]	500 µs[4]
Frequenza di commutazione	1000 Hz[5]	1000 Hz[5]
Tipo di protezione	IP66, IP67	IP66, IP67
Classe di protezione	III	III
Commutazioni di protezione	A, B, C, D[6]	A, B, C, D[6]
Temperatura ambientale di funzionamento	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Oggetto con il 90% di remissione (riferito al bianco standard DIN 5033)
2 16 V DC ... 30 V DC, senza carico
3 10 V DC ... 16 V DC, senza carico
4 Durata segnale con carico ohmico in modalità di commutazione. Possibilità di valori diversi in modalità COM2.
5 Con rapporto chiaro/scuro 1:1 in modalità di commutazione. Possibilità di valori diversi in modalità IO-Link
6 A = U_V-Allacciamenti protetti dall'inversione di polarità
B = entrate e uscite protette da polarità inversa
C = Soppressione impulsi di disturbo
D = uscite protette da sovracorrente e da cortocircuito.

55.2 Dati tecnici Bluetooth®

Caratteristiche	Valori
Portata Bluetooth®	100 m a vista
Tipo di tecnologia radio	BLE
Classe di potenza	2
Produttore modulo Bluetooth®	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
RF Band	2402-2480 MHz
Potenza in uscita	2 dBM
Declaration ID	D033906
Qualified Design ID	89630
Specification Name	4.1
Membro associato	SICK AG

INSTRUCCIONES DE USO

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

Producto descrito

WTB16 - Bluetooth®

Fabricante

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Alemania

Información legal

Documento original

Este es un documento original de SICK AG.

Índice

56 Para su seguridad

56.1 Indicaciones generales de seguridad

- Lea las instrucciones de uso antes de realizar la puesta en servicio.
-  Únicamente personal especializado y debidamente cualificado debe llevar a cabo las tareas de conexión, montaje y configuración.
-  No se trata de un componente de seguridad según las definiciones de la directiva de máquinas de la UE.
-  Al realizar la puesta en servicio, el dispositivo se debe proteger ante la humedad y la contaminación.
- Las presentes instrucciones de uso contienen la información necesaria para toda la vida útil del sensor.

56.2 Indicaciones sobre la homologación UL

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

57 Uso conforme a lo previsto

La WTB16 Bluetooth es una fotocélula optoelectrónica de detección sobre objeto (en lo sucesivo llamada sensor) empleada para la detección óptica y sin contacto de objetos, animales y personas. Cualquier uso diferente al previsto o modificación en el producto invalidará la garantía por parte de SICK AG.

58 Elementos de mando y visualización

Fotocélula de reflexión sobre espejo con supresión de fondo.

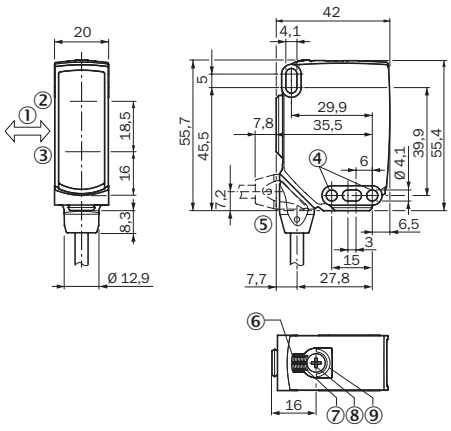

Figura 51: Dibujo acotado 1, cable

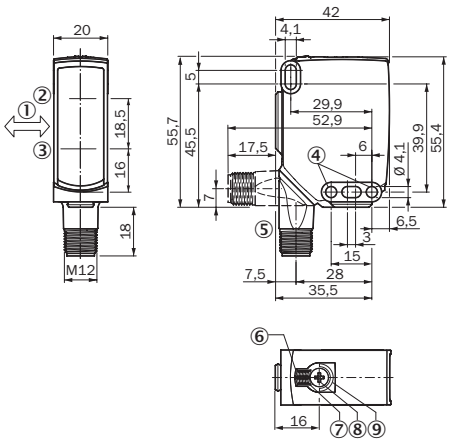

Figura 52: Dibujo acotado 2, conector

① Orientación preferente del objeto

② Centro del eje óptico del emisor
③ Centro del eje óptico del receptor
④ Orificio de fijación, Ø4,1 mm
⑤ Conexión
⑥ LED indicador verde: tensión de alimentación activa
⑦ LED indicador amarillo: estado de recepción de luz
⑧ Pulsador giratorio: ajuste de la distancia de conmutación
⑨ BluePilot azul: indicador de distancia de conmutación

59 Montaje

Montar el sensor en una escuadra de fijación adecuada (véase el programa de accesorios SICK).

Respetar el par de apriete máximo admisible del sensor de < 1,3 Nm.

Vorzugsrichtung des Objektes zum Sensor beachten, véase figura 51, figura 52.

60 Instalación eléctrica

Los sensores deben conectarse sin tensión (U_V = 0 V). Debe tenerse en cuenta la siguiente información en función del tipo de conexión:

- Conexión de enchufes: observar la asignación de terminales.
- Cable: color del hilo

No aplicar ni conectar la alimentación de tensión (U_V > 0 V) hasta que no se hayan finalizado todas las conexiones eléctricas.

Explicaciones relativas al diagrama de conexiones (tabla 11, tabla 12).

MF (configuración 2 de terminales) = entrada externa, teach-in, señal de conmutación

Q_{L1}/C = salida conmutada, comunicación con sistema IO-Link

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Tabla 11: CC

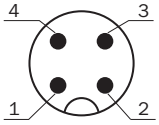
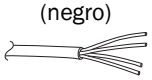
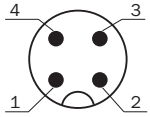
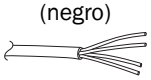
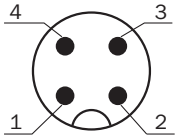
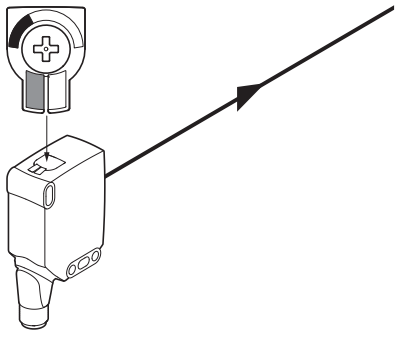
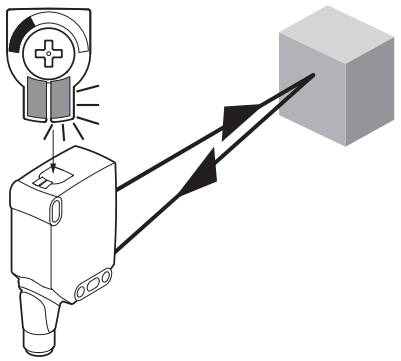
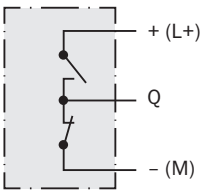
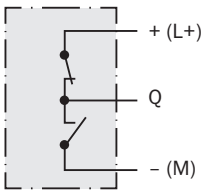
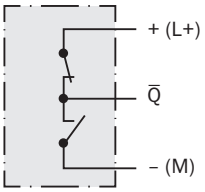
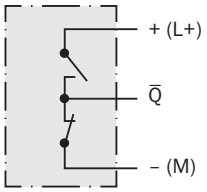
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
Por defecto: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
Por defecto: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn (marrón) 2 = wht (blanco) 3 = blu (azul) 4 = blk (negro)  0,14 mm² AWG26		1 = brn (marrón) 2 = wht (blanco) 3 = blu (azul) 4 = blk (negro)  0,14 mm² AWG26	

Tabla 12: Push / Pull

		
Q push-pull (≤ 100 mA)		
$\overline{Q}$ push-pull (≤ 100 mA)		

61 Puesta en servicio

Bluetooth® se conecta durante la puesta en servicio inicial. SOPASair está disponible en Google PlayStore (Android) y en App Store (iOS).
Requisitos del sistema operativo: versión 6.0 de Android; última versión de iOS.

1 **Alineación**

WTB16P Bluetooth®: oriente el sensor hacia un objeto. Debe seleccionarse una posición que permita que el haz de luz roja del emisor incida en el centro del objeto. Hay que procurar que la apertura óptica (pantalla frontal) del sensor esté completamente libre [véase figura 53, véase figura 54].

WTB16I Bluetooth®: oriente el sensor hacia un objeto. Seleccione una posición que permita que la luz infrarroja (no visible) incida en el centro del objeto. La alineación correcta solo se puede reconocer mediante los LED indicadores. Véanse a este respecto las véase figura 53, figura 54, véase tabla 11, véase tabla 12. Hay que procurar que la apertura óptica (pantalla frontal) del sensor esté completamente libre.

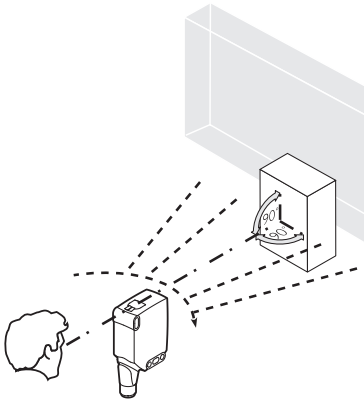


Figura 53: Alineación 1

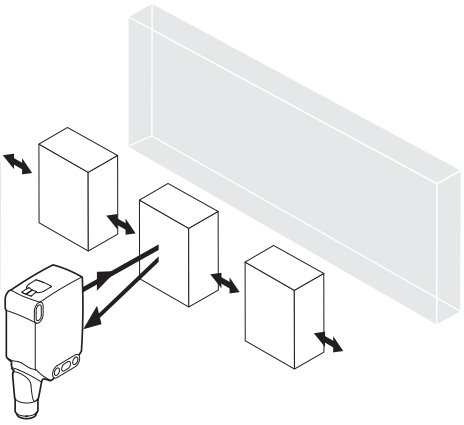


Figura 54: Alineación 2

2 **Distancia de conmutación**

Comprobar las condiciones de aplicación: comparar la distancia de conmutación y la distancia respecto al objeto o al fondo, así como la capacidad de reflectancia del objeto, con el diagrama correspondiente [véanse la imágenes 5 y 7] (x = distancia de conmutación, y = distancia mínima entre la distancia de conmutación ajustada y el fondo [blanco, 90%]), reflectancia: 6% = negro ①, 18% = gris ②, 90% = blanco ③ (referido al blanco estándar según DIN 5033). Recomendamos realizar los ajustes con un objeto de reflectancia baja. La distancia mínima (= y) para la supresión del fondo puede calcularse a partir del diagrama [figura 55 ①] del modo siguiente:
Ejemplo: x = 400 mm, y = 25 mm. Es decir, el fondo (blanco, 90%) se suprimirá a partir de una distancia > 25 mm del sensor.

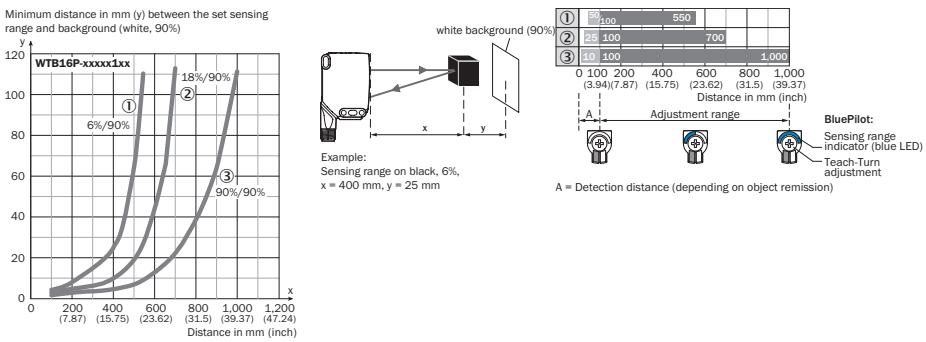


Figura 55: Curva característica 1, WTB16P Bluetooth-xxxxx1xx, luz roja

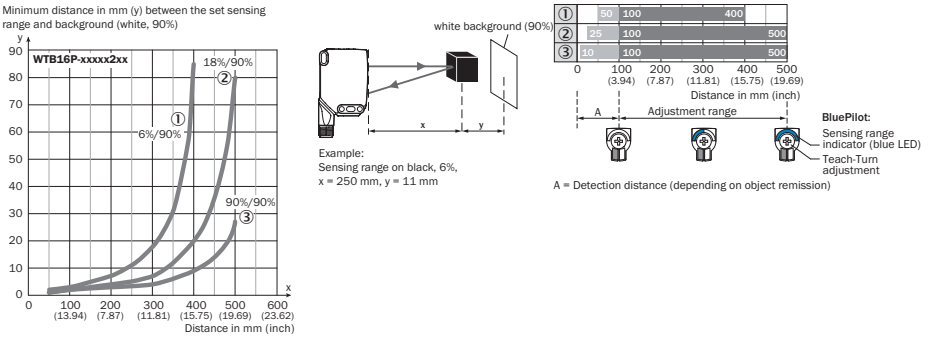


Figura 56: Curva característica 2, WTB16P Bluetooth-xxxxx2xx, luz roja

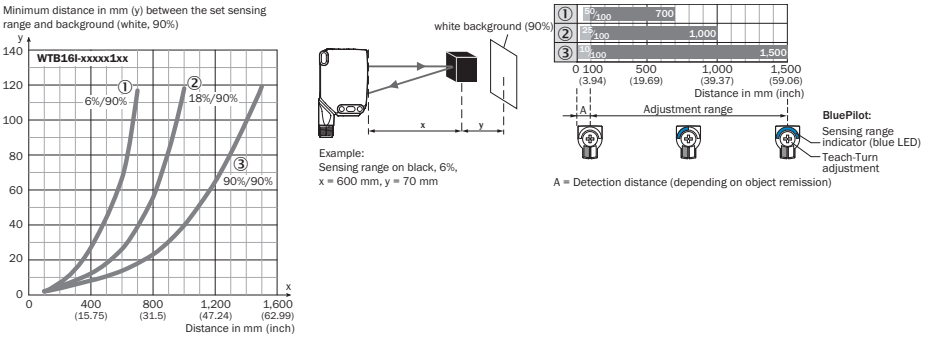


Figura 57: Curva característica 3, WTB16I Bluetooth-xxxxx1xx, luz infrarroja

Ajuste de la distancia de conmutación

WTB16x-xxxxxx2xAxx con pulsador giratorio:
Pulsando la tecla teach-in (aprox. de 1 a 3 s) se ajusta la distancia de conmutación. En función de los requisitos, con el potenciómetro (sin pulsar la tecla teach-in) puede llevarse a cabo un ajuste de precisión.
Giro hacia la derecha: aumenta la distancia de conmutación.
Giro hacia la izquierda: se reduce la distancia de conmutación.
La distancia de conmutación también puede ajustarse solo con el potenciómetro.
Recomendamos poner la distancia de conmutación en el objeto, p. ej., véase la imagen 8. Una vez ajustada la distancia de conmutación, retirar el objeto de la trayectoria del haz, el fondo se suprime, y la salida conmutada cambia (tabla 11, tabla 12).

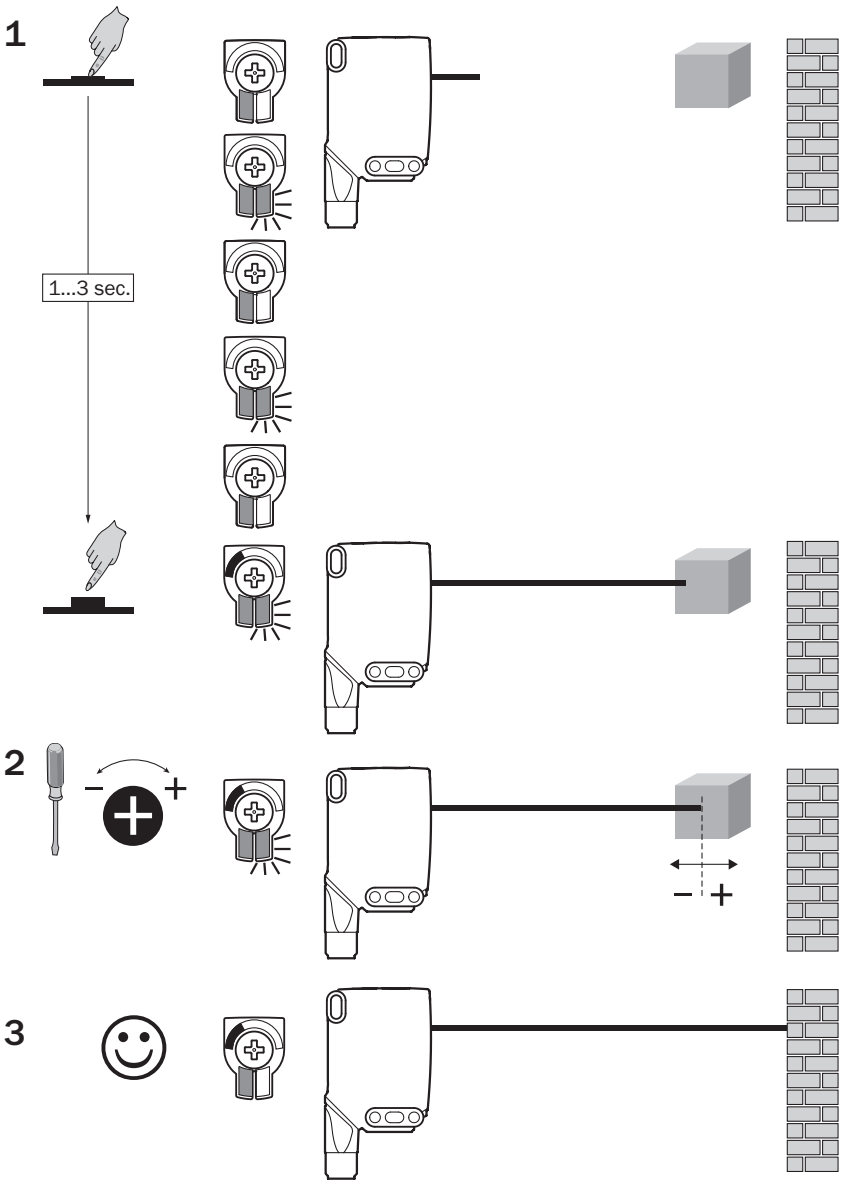


Figura 58: WTB16x-xxxxxx2xAxx, ajuste de la distancia de conmutación con pulsador giratorio

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WTB16x-xxxxxx1xAxx con potenciómetro:
Con el potenciómetro se ajusta la distancia de conmutación.
Giro hacia la derecha: aumenta la distancia de conmutación.
Giro hacia la izquierda: se reduce la distancia de conmutación.
Recomendamos poner la distancia de conmutación en el objeto, p. ej., véase la imagen 9. Una vez ajustada la distancia de conmutación, retirar el objeto de la trayectoria del haz, el fondo se suprime, y la salida conmutada cambia (tabla 11, tabla 12).

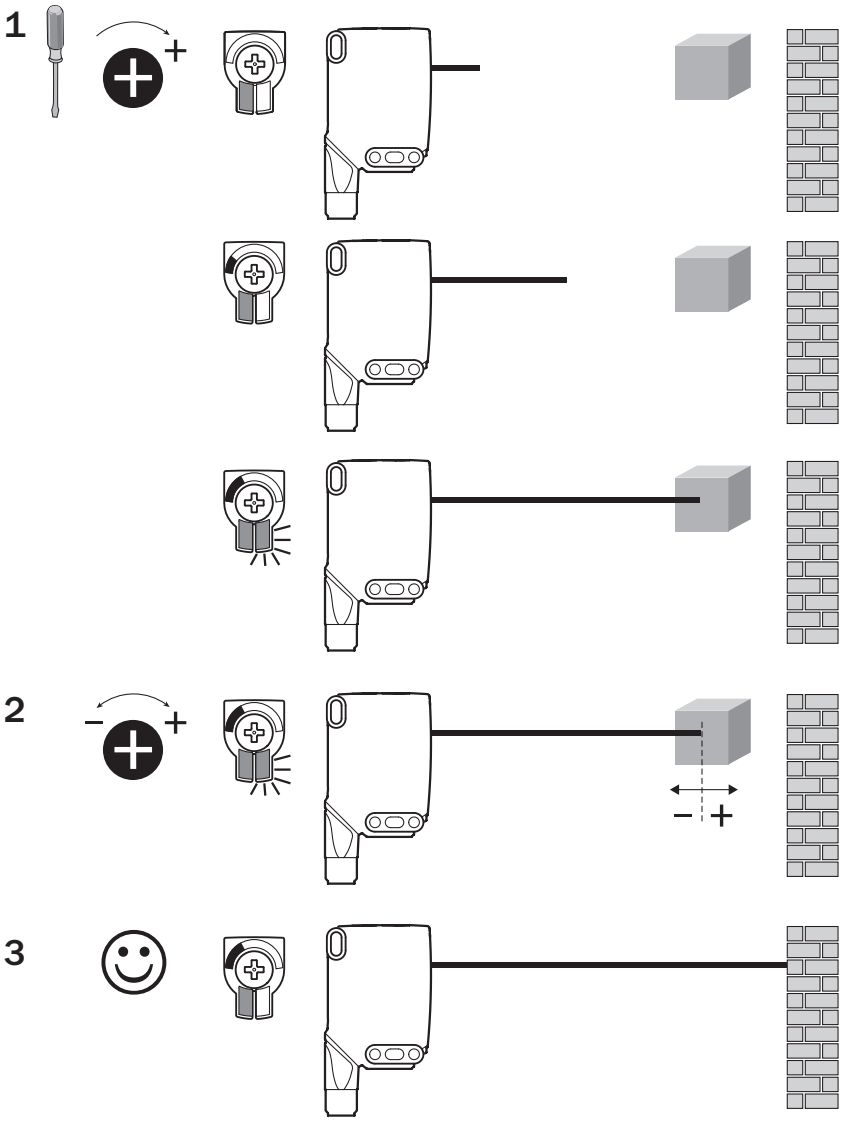

Figura 59: WTB16x-xxxxxx1xAxx, ajuste de la distancia de conmutación con potenciómetro

WTB16x-xxxxxx3xAxx con tecla teach-in:
Pulsando la tecla teach-in (aprox. de 1 a 3 s) se ajusta la distancia de conmutación. Recomendamos poner la distancia de conmutación en el objeto, p. ej., véase la imagen 10. Una vez ajustada la distancia de conmutación, retirar el objeto de la trayectoria del haz, el fondo se suprime, y la salida conmutada cambia (tabla 11, tabla 12).

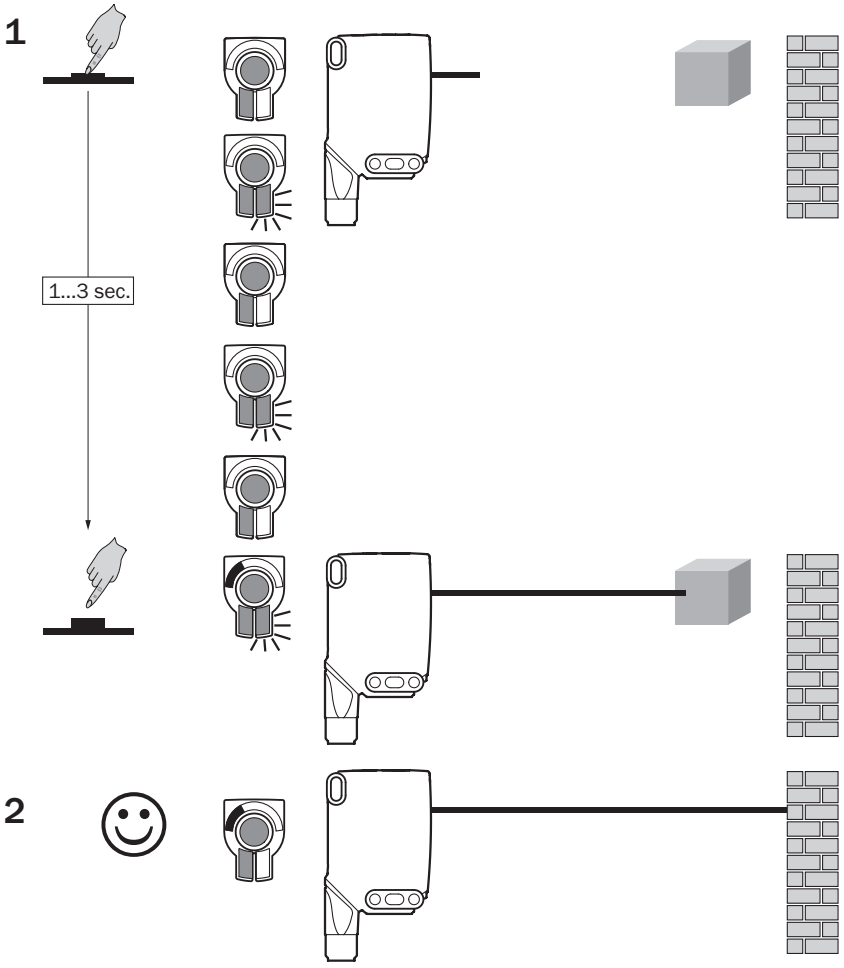

Figura 60: WTB16x-xxxxxx3xAxx, ajuste de la distancia de conmutación con tecla teach-in

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Estructura de datos de proceso (versión 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Datos de proceso	2 bytes					4 bytes
	Byte 0: bit 15 ... 8 Byte 1: bit 7 ... 0					Byte 0: bit 31 ... 24 Byte 1: bit 13 ... 16 Byte 2: bit 15 ... 8 Byte 3: bit 7 ... 0
Bit 0 / tipo de datos	Q_{L1} / booleano					
Bit 1 / tipo de datos	Q_{L2} / booleano			Qint.1 / booleano	Q_{L2} / booleano	Qint.1 / booleano
Bit... / descripción / tipo de datos	2 ... 15 / [vacío]	2 ... 15 / [valor de medición de tiempo] / UInt 14	2 ... 15 / [valor de contador] / UInt 14	2 ... 15 / [longitud / medición de velocidad] / SInt14	2 / Qint. 1 / booleano	2 ... 7 / [vacío]
Bit... / descripción / tipo de datos					3 ... 15 / [valor de medición de tiempo] / UInt13	8 ... 31 / [carga de portador] / UInt 24

62 Resolución de problemas

La tabla “Resolución de problemas” muestra las medidas que hay que tomar cuando ya no está indicado el funcionamiento del sensor.

LED indicador / imagen de error	Causa	Acción
El LED verde parpadea	Comunicación con sistema IO-Link	ninguna
Las salidas conmutadas no se comportan según la tabla 12	1. Comunicación con sistema IO-Link 2. Cambio de la configuración 3. Cortocircuito	1. ninguna 2. Adaptación de la configuración 3. Comprobar las conexiones eléctricas
El LED amarillo se ilumina, no hay ningún objeto en la trayectoria del haz	La distancia de conmutación está ajustada a una distancia excesiva	Reducir la distancia de conmutación
El objeto se encuentra en la trayectoria del haz, el LED amarillo no se ilumina	La distancia entre el sensor y el objeto es excesiva o la distancia de conmutación ajustada es insuficiente	Aumentar la distancia de conmutación
En SOPASair no se muestra el sensor	1. Existe conexión con otro dispositivo portátil. 2.El dispositivo portátil está fuera de la zona de emisión del sensor.	1. Ninguna o desactivar la conexión existente. 2. Comprobar la situación de montaje (p. ej., apantallamiento metálico).

LED indicador / imagen de error	Causa	Acción
	3. Bluetooth LE está desactivado en el sensor. 4. Bluetooth LE está desactivado en el dispositivo portátil. 5. El filtro de dirección MAC está activado; el dispositivo portátil no está autorizado.	3. Activar Bluetooth LE mediante el maestro SiLink2 o IO-Link 4. Activar Bluetooth LE 5. Ninguna o cambiar el filtro de dirección MAC.
No se puede establecer conexión con el sensor	1. La versión de Android o iOS no cumple con los requisitos. 2. La versión de SOPASair no contiene el controlador requerido.	1. Compruebe el sistema operativo. 2. Desinstale SOPASair; instale la última versión de la aplicación.

63 Desmontaje y eliminación

El sensor debe eliminarse de conformidad con las reglamentaciones nacionales aplicables. Como parte del proceso de eliminación, se debe intentar reciclar los materiales al máximo posible (especialmente los metales preciosos).

INDICACIÓN

Eliminación de las baterías y los dispositivos eléctricos y electrónicos

- De acuerdo con las directivas internacionales, las pilas, las baterías y los dispositivos eléctricos y electrónicos no se deben eliminar junto con la basura doméstica.
- La legislación obliga a que estos dispositivos se entreguen en los puntos de recogida públicos al final de su vida útil.
-  La presencia de este símbolo en el producto, el material de embalaje o este documento indica que el producto está sujeto a esta reglamentación.

64 Mantenimiento

Los sensores SICK no precisan mantenimiento.

A intervalos regulares, recomendamos:

- Limpiar las superficies ópticas externas
- Comprobar las uniones roscadas y las conexiones.

No se permite realizar modificaciones en los aparatos.

Sujeto a cambio sin previo aviso. Las propiedades y los datos técnicos del producto no suponen ninguna declaración de garantía.

65 Homologaciones

65.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries**

Country	Comments
	Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

66 Datos técnicos

66.1 Datos técnicos

	WTB16P Bluetooth	WTB16I Bluetooth
Distancia de conmutación máx.	10 mm ... 1.000 mm (tipo)[1]	10 mm ... 1.500 mm[1]
Diámetro del punto luminoso/distancia	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (tipo)	Ø 12 mm (800 mm)
Tensión de alimentación U_V	DC 10 ... 30 V	DC 10 ... 30 V
Consumo de corriente	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Intensidad de salida $I_{max.}$	≤ 100 mA	≤ 100 mA
Tiempo de respuesta máx.	500 µs[4]	500 µs[4]
Frecuencia de conmutación	1000 Hz[5]	1000 Hz[5]
Tipo de protección	IP66, IP67	IP66, IP67
Clase de protección	III	III
Circuitos de protección	A, B, C, D[6]	A, B, C, D[6]
Temperatura ambiente de servicio	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Material con un 90% de reflexión (sobre el blanco estándar según DIN 5033)
2 16 VCC...30 VCC, sin carga
3 10 VCC...16 VCC, sin carga
4 Duración de la señal con carga óhmica en modo de conmutación. Posibilidad de valores diferentes en el modo COM2.
5 Con una relación claro/oscuro de 1:1 en modo de conmutación. Posibilidad de valores diferentes en el modo IO-Link.
6 A = U_V protegidas contra polarización inversa
B = Entradas y salidas protegidas contra polarización incorrecta
C = Supresión de impulsos parásitos
D=Salidas a prueba de sobrecorriente y cortocircuitos.

66.2 Datos técnicos de Bluetooth®

Características	Valores
Alcance de Bluetooth®	100 m con vista
Tipo de radio	BLE
Clase de radio	2
Fabricante del módulo de Bluetooth®	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709 EE. UU.
Banda de RF	2402 - 2480 MHz
Potencia de salida	2 dBM
ID de declaración	D033906
ID de diseño cualificado	89630
Nombre de especificación	4.1
Empresa miembro	SICK AG

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操作指南

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

所说明的产品

WTB16 - Bluetooth®

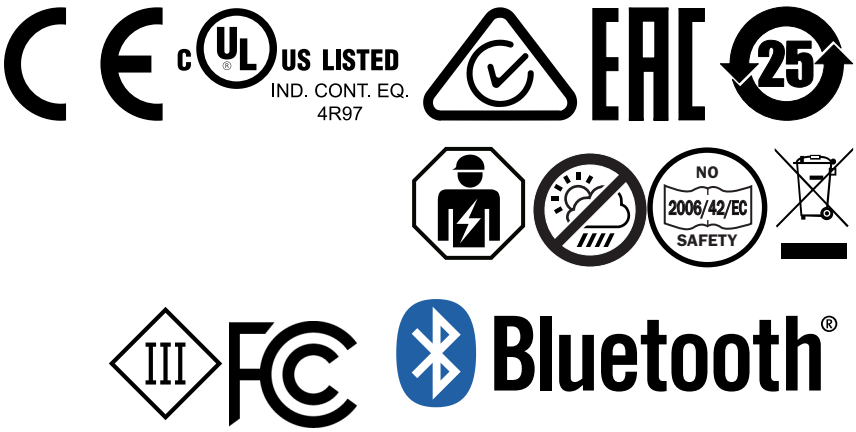
制造商

SICK AG
Erwin-Sick-Str.1
79183 Waldkirch, Germany
德国

法律信息

原始文档

本文档为西克股份公司的原始文档。



内容

67 安全信息

67.1 一般安全提示

- 调试之前阅读本操作指南。
-  只有经过培训的专业人员才能执行连接、安装和配置工作。
-  非符合欧盟机械指令的安全组件。
-  调试时防止设备受到潮湿和污染影响。
- 这些操作指南包含传感器寿命周期内所必需的信息。

67.2 关于 UL 认证的提示

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

68 规定用途

WTB16 Bluetooth 是一种漫反射式光电传感器（下文简称为“传感器”），用于物体、动物和人体的非接触式光学检测。如滥用本产品或擅自对其改装，则 SICK 公司的所有质保承诺均将失效。

69 操作及显示元件

带背景抑制功能的漫反射式光电传感器

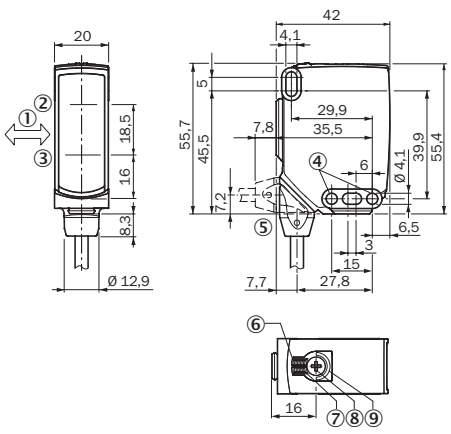


插图 61: 尺寸图 1，电缆

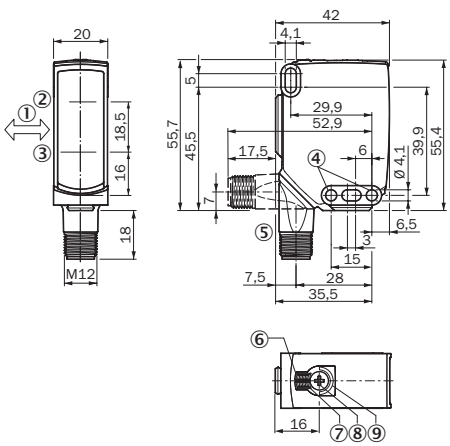


插图 62: 尺寸图 2，插头

① 待测物体的优选方向
② 发射器光轴中心
③ 接收器光轴中心
④ 安装孔，Ø4.1 mm
⑤ 接口
⑥ 绿色 LED 指示灯：工作电压激活

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⑦ 黄色 LED 指示灯：光接收状态
⑧ 按转元件：设置触发感应距离
⑨ BluePilot 蓝色：触发感应距离指示灯

70 安装

将传感器安装在合适的安装支架上（参见 SICK 配件目录）。

注意传感器的最大允许拧紧力矩为 < 1,3 Nm。

Vorzugsrichtung des Objektes zum Sensor beachten, 参见 插图 61, 插图 62.

71 电气安装

必须在无电压状态（U_V = 0 V）连接传感器。依据不同连接类型，注意下列信息：

- 插头连接：注意引脚分配。
- 电缆：芯线颜色

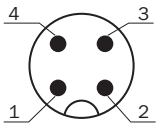
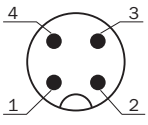
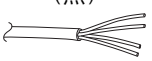
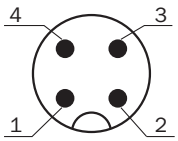
完成所有电气连接后，才可施加或接通电压供给（U_V > 0 V）。

接线图（表格 13 表格 13）说明。

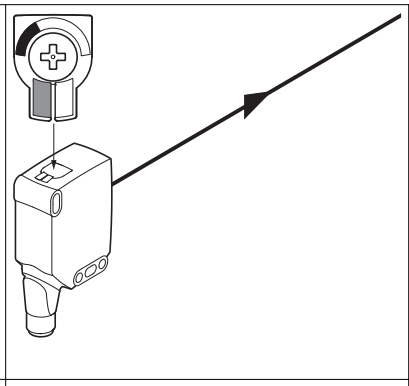
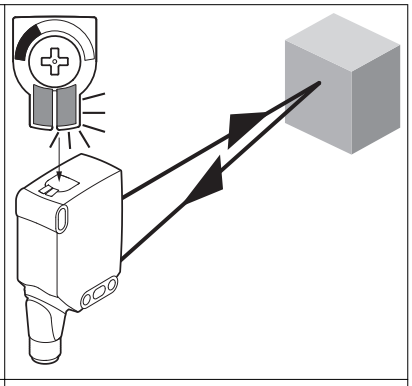
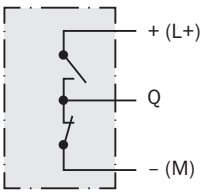
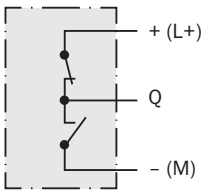
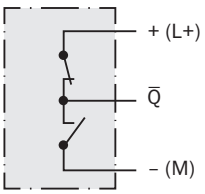
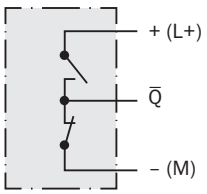
MF（针脚 2 配置） = 外部输入端，示教功能，开关信号

Q_{L1}/C = 开关量输出，IO-Link 通信

表格 13: DC

WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
默认：MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
默认：Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn（棕） 2 = wht（白） 3 = blu（蓝） 4 = blk（黑）  0.14 mm² AWG26		1 = brn（棕） 2 = wht（白） 3 = blu（蓝） 4 = blk（黑）  0.14 mm² AWG26	

表格 14: 推/挽

		
Q 推挽 (≤ 100 mA)		
$\overline{Q}$ 推挽 (≤ 100 mA)		

72 调试

Bluetooth® 在首次调试启用时开启。SOPASair 可在 Google PlayStore（Android）和 App Store（iOS）中下载。
对于操作系统的要求：Android 版本 6.0，iOS 最新版本。

1 **校准**

WTB16P Bluetooth®: 将传感器对准物体。选择定位，确保红色发射光束射中物体的中间。此时，应注意传感器的光学开口（透明保护盖）处应无任何遮挡 [参见 插图 63, 参见 插图 64]。

WTB16I Bluetooth®: 将传感器对准物体。选择定位，确保红外光（不可见光）射中物体的中间。仅可通过 LED 指示灯辨别校准是否正确。参见 插图 63, 插图 64, 参见 表格 13, 表格 14。此时，应注意传感器的光学开口（透明保护盖）处应无任何遮挡。

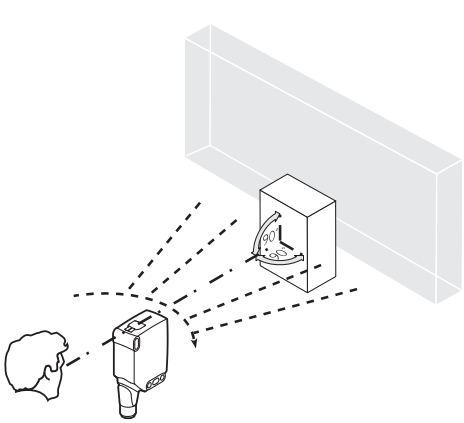


插图 63: 校准 1

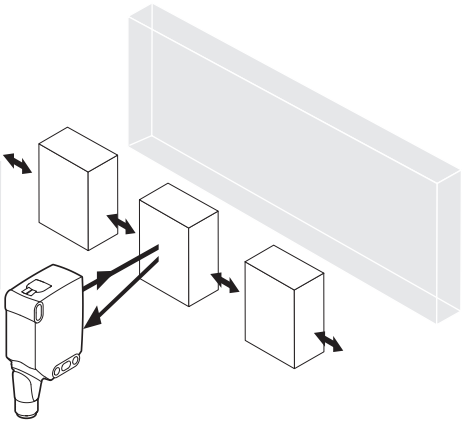


插图 64: 校准 2

2 **触发感应距离**

检查使用条件：使用随附的图表 [参见插图 5 和 7] 调整触发感应距离和物体距离，或背景及物体的反射能力（x = 触发感应距离，y = 已设置的触发感应距离和背景（白色，90%）之间的最小距离，反射比：6% = 黑色 ①，18% = 灰色 ②，90% = 白色 ③（DIN 5033 规定的标准白））。我们建议使用反射比较低的物体进行设置。

背景抑制功能的最小距离（= y）可根据图表 [插图 65 ①] 按如下方法确定：

示例：x = 400 mm，y = 25 mm。即，当与传感器距离 > 25 mm 时，才能抑制背景（白色，90%）。

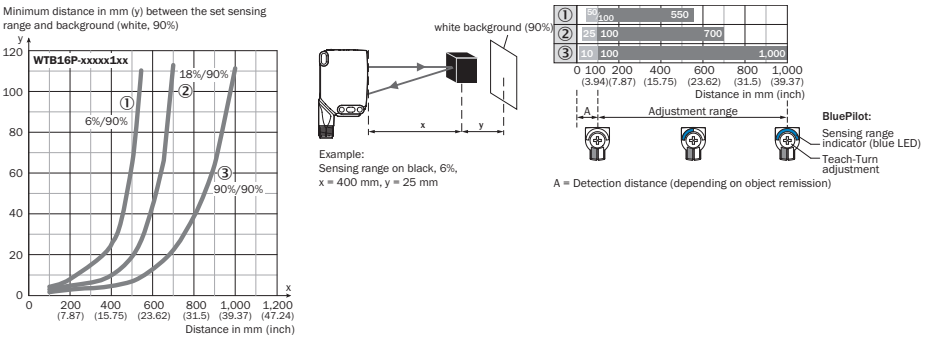


插图 65: 特征曲线 1，WTB16P Bluetooth-xxxxx1xx，红光

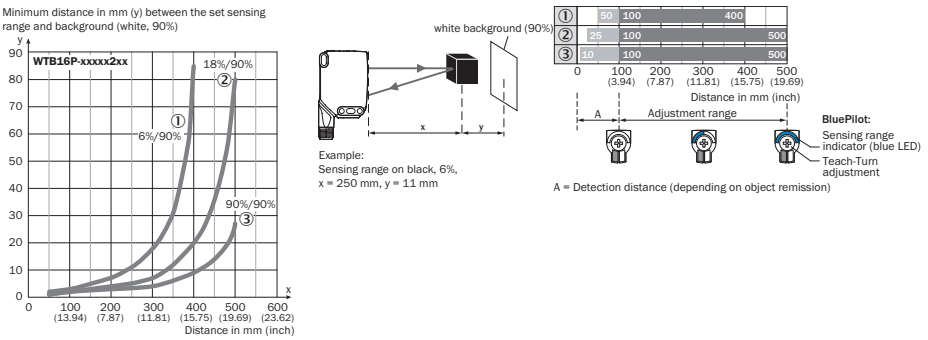


插图 66: 特征曲线 2，WTB16P Bluetooth-xxxxx2xx，红光

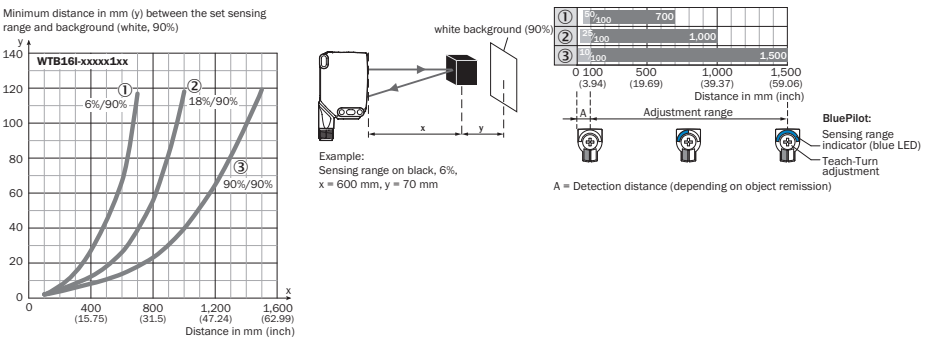


插图 67: 特征曲线 3，WTB16I Bluetooth-xxxxx1xx，红外光

触发感应距离设置

WTB16x-xxxxxx2xAxx，带有按转元件:
通过按下示教键（约 1-3 秒）可设置触发感应距离。根据要求，可使用电位计（不要按压示教键）进行微调。
向右旋转：提高触发感应距离。
向左旋转：降低触发感应距离。
也可仅通过电位计设置触发感应距离。我们建议触发感应距离应涵盖物体位置，例如参见插图 8。触发感应距离设置完成后，将物体从光路中移除，同时，将抑制背景并改变开关量输出（表格 13, 表格 14）。

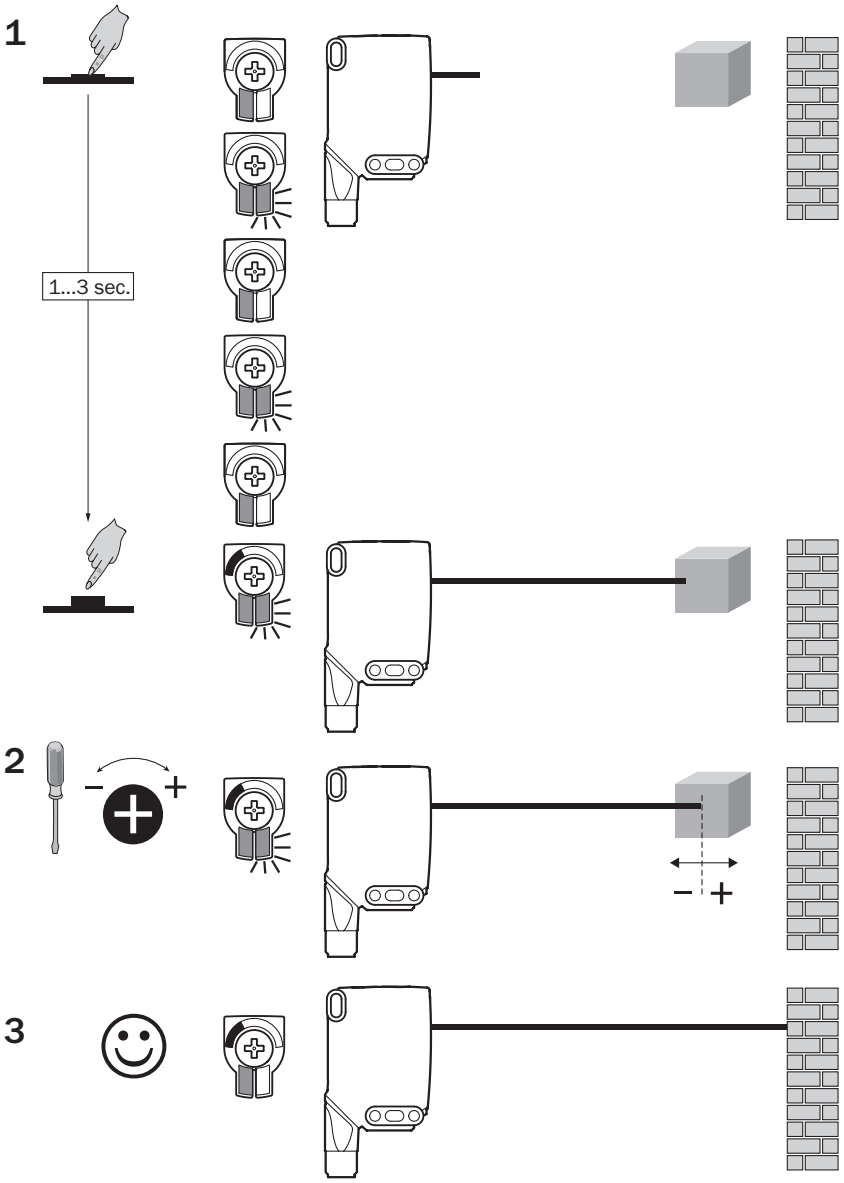


插图 68: WTB16x-xxxxxx2xAxx，利用按转元件设置触发感应距离

WTB16x-xxxxxx1xAxx，带有电位计：
利用电位计设置触发感应距离。
向右旋转：提高触发感应距离。
向左旋转：降低触发感应距离。
我们建议触发感应距离应涵盖物体位置，例如参见插图 9。触发感应距离设置完成后，将物体从光路中移除，同时，将抑制背景并改变开关量输出（表格 13，表格 14）。

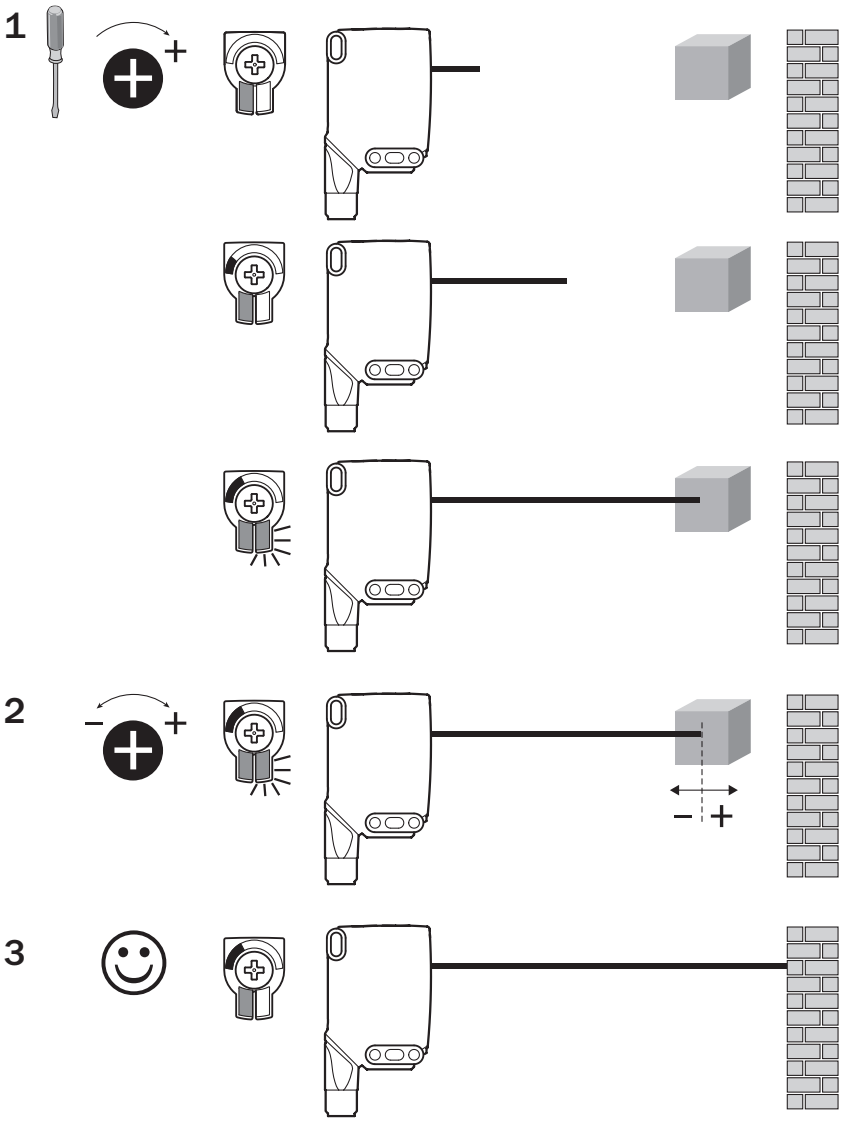


插图 69: WTB16x-xxxxxx1xAxx，利用电位计设置触发感应距离

WTB16x-xxxxxx3xAxx，带有示教键：

通过按下示教键（约 1-3 秒）可设置触发感应距离。我们建议触发感应距离应涵盖物体位置，例如参见插图 10。触发感应距离设置完成后，将物体从光路中移除，同时，将抑制背景并改变开关量输出（表格 13, 表格 14）。

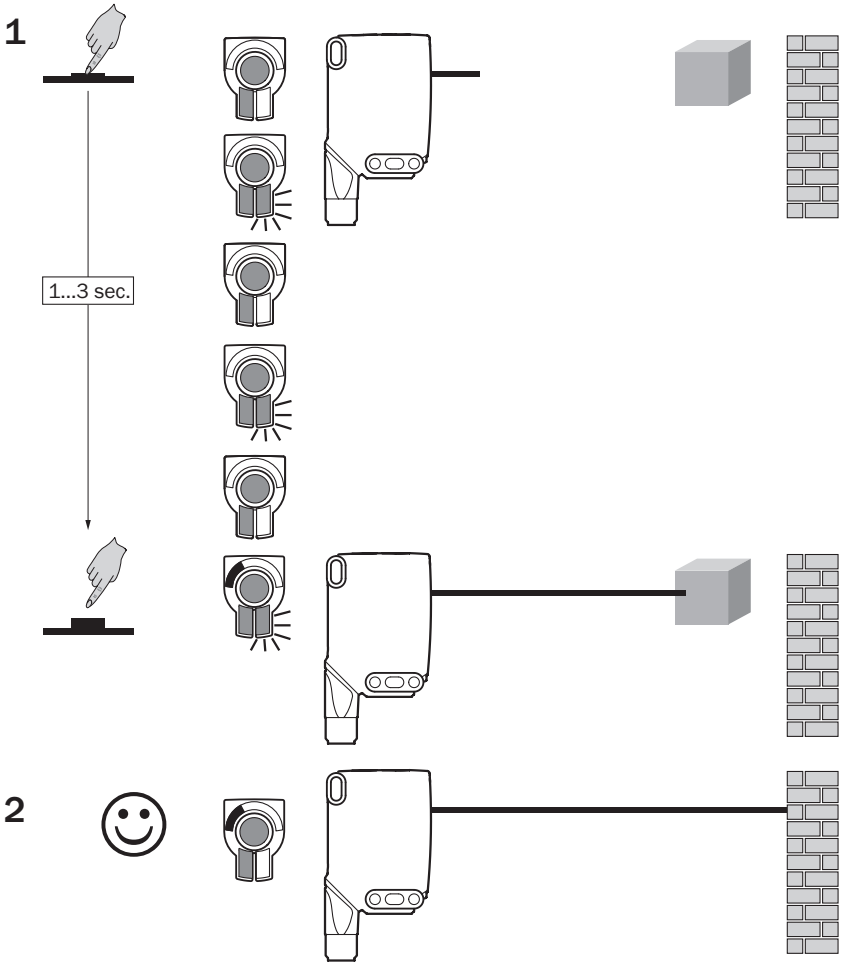


插图 70: WTB16x-xxxxxx3xAxx，利用示教键设置触发感应距离

流程数据结构（版本 1.1）

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
流程数据	2 Byte					4 Byte
	Byte 0: Bit 15... 8 Byte 1: Bit 7... 0					Byte 0: Bit 31... 24 Byte 1: Bit 13... 16 Byte 2: Bit 15... 8 Byte 3: Bit 7... 0
Bit 0/ 数据类型	Q_{L1} / Boolean					
Bit 1/ 数据类型	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Bit... / 描述/ 数据类型	2...15 / [empty]	2...15 / [Time measurement value] / UInt 14	2 ... 15 / [Counter value] / UInt 14	2 ... 15 / [Length / speed measurement] / SInt14	2 / Qint. 1 / Boolean	2...7 / [empty]
Bit... / 描述/ 数据类型					3 ... 15 / [Time measurement value] / UInt13	8 ... 31 / [Carrier load] / UInt 24

73 故障排除

故障排除表格中罗列了传感器无法执行某项功能时应采取的各项措施。

LED 指示灯 / 故障界面	原因	措施
绿色 LED 闪烁	IO-Link 通信	无
开关量输出的表现不符合表 表格 14	1. IO-Link 通信 2. 配置变化 3. 短路	1. 无 2. 配置调整 3. 检查电气连接
黄色 LED 亮起，光路中无物体	触发感应距离设置过大	降低开关距离
光路中有物体，黄色 LED 未亮起	传感器和物体之间的间距过大或开关距离设置的过小	增大开关距离
在 SOPASair 中不显示传感器	1. 与另一个手持式编程工具存在连接。 2.该手持式编程工具位于传感器的发射范围之外。 3. 传感器中的蓝牙 LE 已禁用。 4. 手持式编程工具中的蓝牙 LE 已禁用。 5. MAC 地址筛选已启用，手持式编程工具未授权。	1. 无连接或现有连接已禁用。 2. 检测安装情况（例如由于金属而受到屏蔽）。 3. 通过 SiLink2 Master 或 IO-Link 启用蓝牙 LE 4. 蓝牙 LE 的启用 5. MAC 地址筛选缺失或已更改。
无法建立与传感器的连接	1. Android 或 iOS 版本不符合要求。	1. 请检查操作系统。 2. 请卸载 SOPASair，安装最新的应用程序版本。

LED 指示灯 / 故障界面	原因	措施
	2. SOPASair 版本中没有所需的驱动程序。	

74 拆卸和废弃处置

必须根据适用的国家/地区特定法规处理传感器。在废弃处置过程中应努力回收构成材料（特别是贵金属）。

提示

电池、电气和电子设备的废弃处置

- 根据国际指令，电池、蓄电池和电气或电子设备不得作为一般废物处理。
- 根据法律，所有者有义务在使用寿命结束时将这些设备返还给相应的公共收集点。
- 
  产品、其包装或本文档中的此符号表示产品受这些法规约束。

75 保养

SICK 传感器无需保养。

我们建议，定期:

- 清洁镜头检测面
- 检查螺栓连接和插头连接

不得对设备进行任何改装。

如有更改,不另行通知。所给出的产品特性和技术参数并非质保声明。

76 许可

76.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries** Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

77 技术数据

77.1 技术数据

	WTB16P Bluetooth	WTB16I Bluetooth
最大开关距离	10 mm ... 1.000 mm (类型)[1]	10 mm ... 1.500 mm[1]
光斑直径/距离	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (类型)	Ø 12 mm (800 mm)
供电电压 U_V	DC 10 ... 30 V	DC 10 ... 30 V
消耗电流	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
输出电流 $I_{max.}$	≤ 100 mA	≤ 100 mA
最长响应时间	500 µs[4]	500 µs[4]
开关频率	1000 Hz[5]	1000 Hz[5]
防护类型	IP66, IP67	IP66, IP67
防护等级	III	III
保护电路	A, B, C, D[6]	A, B, C, D[6]
工作环境温度	–40 °C ... +60 °C	–40 °C ... +60 °C

1 具有 90 % 反射比的扫描对象（指 DIN 5033 规定的标准白）
2 16VDC...30VDC，无负荷
3 10VDC...16VDC，无负荷
4 信号传输时间（开启模式中的电阻性负荷时）。在 COM2-模式下允许偏差值。
5 明暗比 1:1，在开启模式时。在 IO-Link 模式下允许偏差值。
6 A = U_V 接口（已采取反极性保护措施）
B = 具有反极性保护的输入端和输出端
C = 抑制干扰脉冲
D = 抗过载电流和抗短路输出端

77.2 Bluetooth 技术参数®

特点	数值
Bluetooth® 有效距离	视野范围 100 m
无线电类型	BLE

特点	数值
无线电级别	2
Bluetooth® 模块制造商	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
RF 频段	2402 - 2480 MHz
输出功率	2 dBM
声明 ID	D033906
合格设计 ID	89630
规格名称	4.1
成员公司	SICK AG

取扱説明書

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

説明されている製品

WTB16 - Bluetooth®

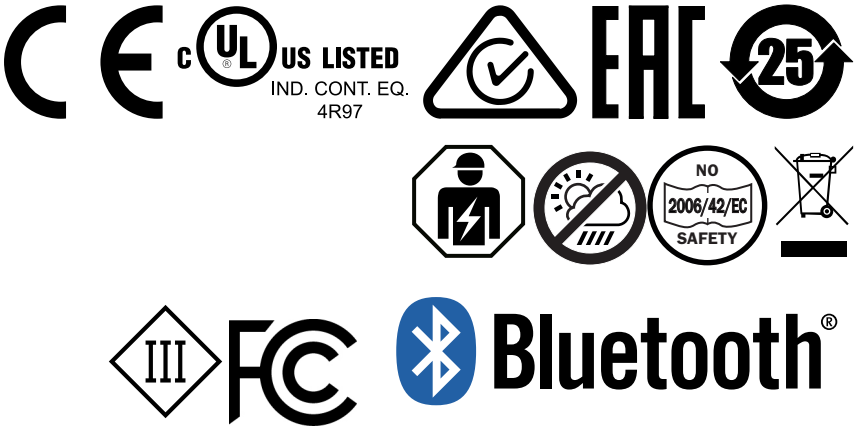
メーカー

SICK AG
Erwin-Sick-Str.1
79183 Waldkirch
Germany

法律情報

オリジナルドキュメント

このドキュメントは SICK AG のオリジナルドキュメントです。



コンテンツ

78 安全情報

78.1 一般的な安全上の注意事項

- コミッショニング前に取扱説明書をよくお読みください。
-  本製品の接続・取付・コンフィグレーションは、訓練を受けた技術者が行ってください。
-  本製品は、EU の機械指令を満たす人体保護用の安全コンポーネントではありません。
-  コミッショニング前に、湿気や汚れから機器を保護してください。
- 本取扱説明書には、センサのライフサイクル中に必要となる情報が記載されています。

78.2 UL 認証に関する注意事項

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

79 正しいご使用方法

WTB16 Bluetooth とはリフレクタ形光電スイッチ (以下センサと呼ぶ) で、物体、動物または人物などを光学技術により非接触で検知するための装置です。製品を用途以外の目的で使用したり改造したりした場合は、SICK AG に対する一切の保証請求権が無効になります。

80 操作/表示要素

背景抑制付きリフレクタ形光電スイッチ

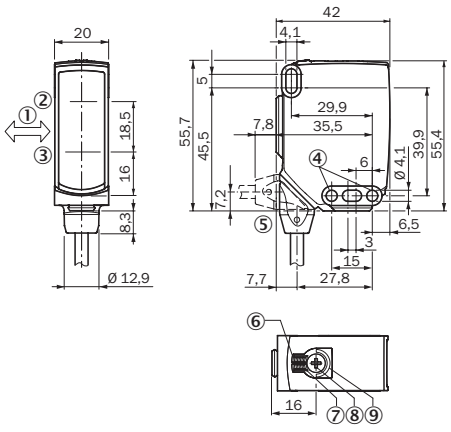


図 71: 寸法図 1、ケーブル

① 検出対象物の優先方向

② 投光器光軸の中心

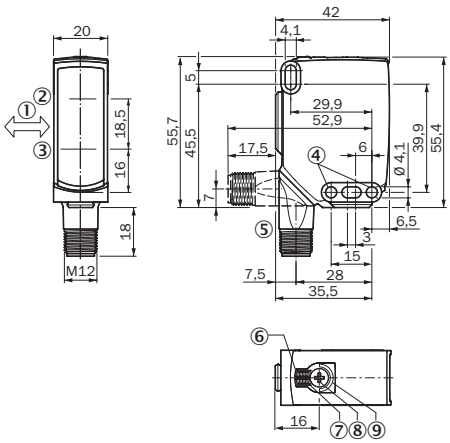


図 72: 寸法図 2、オスコネクタ

③ 受光器光軸の中心
④ 取付穴、Ø4.1 mm
⑤ 接続
⑥ 緑色の LED 表示: 動作電圧有効
⑦ 黄色 LED 表示: 受光ステータス
⑧ プッシュターン要素: 検出距離の設定
⑨ BluePilot 青色: 検出距離表示灯

81 取り付け

センサを適切な取付ブラケットに取り付けます (SICK 付属品カタログを参照)。

センサの締付トルクの最大許容値< 1,3 Nm を遵守してください。

Vorzugsrichtung des Objektes zum Sensor beachten, 参照 図 71, 図 72.

82 電気的設置

センサの接続は無電圧 (V_S = 0 V) で行わなければなりません。接続タイプに応じて以下の情報を遵守してください:

– コネクタ接続: ピン割り当てに注意。
– ケーブル: 芯線色

すべての電気機器を接続してから供給電圧 (V_S > 0 V) を印加、あるいは電源を入れてください。

配線図の説明 (表 15 表 16)

MF (ピン 2 設定) = 外部入力、ティーチイン、スイッチング信号

Q_{L1}/C = スイッチング出力、IO-Link 通信

表 15: DC

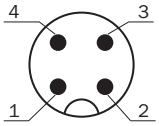
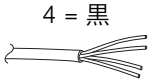
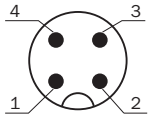
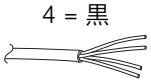
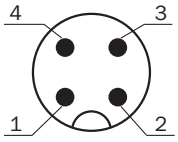
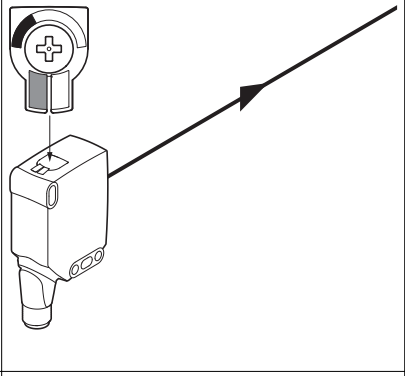
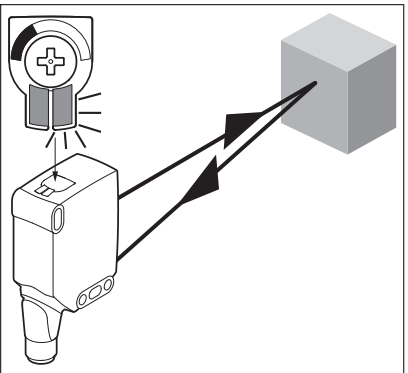
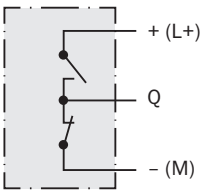
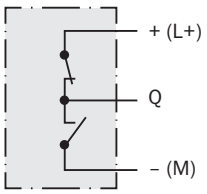
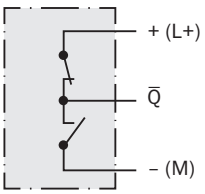
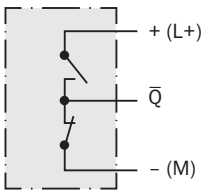
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
デフォルト: MF	$\bar{Q}$	$\bar{Q}$	Q	Q	www.sick.com 8022709
デフォルト: Q_{L1}/C	Q	Q	$\bar{Q}$	$\bar{Q}$	www.sick.com 8022709
		1 = 茶 2 = 白 3 = 青 4 = 黒  0.14 mm² AWG26		1 = 茶 2 = 白 3 = 青 4 = 黒  0.14 mm² AWG26	

表 16: プッシュ / プル

		
Q プッシュプル (≤ 100 mA)		
$\overline{Q}$ プッシュプル (≤ 100 mA)		

83 コミッショニング

Bluetooth®は、初回起動時に有効になります。SOPASair は Google PlayStore (アンドロイド) および App Store (iOS) から入手可能です。
オペレーティングシステム要件: アンドロイドのバージョン 6.0、iOS の最新バージョン。

1 **光軸調整**
WTB16P Bluetooth®: センサを対象物に合わせて光軸調整します。赤色の投光軸が対象物の中央に照射されるように位置決めします。センサの光開口 (フロントカバー) が全く遮らぎられることがないよう注意してください [参照 図 73,図 74]。
WTB16I Bluetooth®: センサを対象物に合わせて光軸調整します。赤外線 (不可視) が対象物の中央に照射されるように位置決めします。光軸調整が正しいかどうかは、LED 表示灯によってのみ確認できます。参照 図 73, 図 74, 参照 表 15, 表 16。センサの光開口 (フロントカバー) が全く遮らぎられることがないよう注意してください。

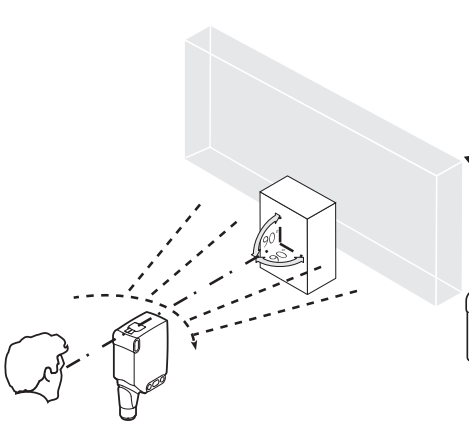


図 73: 光軸調整 1

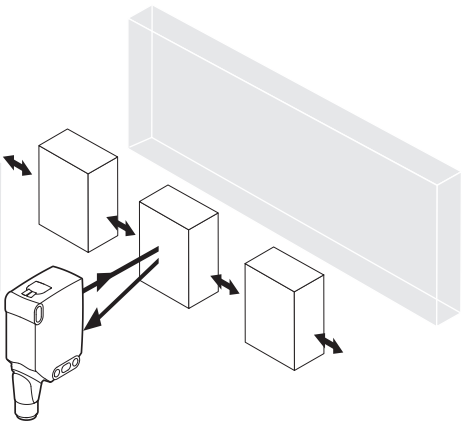


図 74: 光軸調整 2

2 **検出距離**

使用条件の点検: 検出範囲と対象物または背景への距離、ならびに対象物の反射率を対応する図 [図 5 と 7 を参照] に従って調整します (x = 検出範囲、y = 設定された検出距離と背景 (白、90%) との最小距離) 反射率: 6% = 黒 ①、18% = グレー ③、90% = 白 ③ (DIN 5033 に準拠した白)。反射率の低い対象物を使用して調整することをお勧めします。

背景抑制のための最小距離 (= y) は図 [図 75 ①] から以下のように読み取ることができます:

例: x = 400 mm、y = 25 mm。つまりセンサからの間隔が 25 mm より大きい場合に背景 (白、90%) が抑制されます。

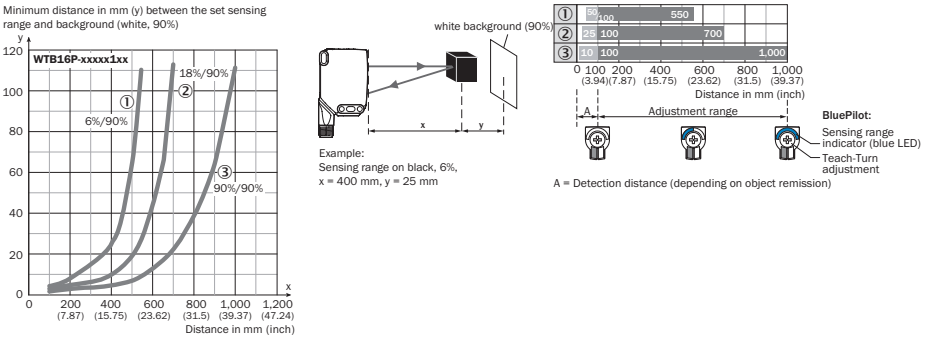


図 75: 特性曲線 1、WTB16P Bluetooth-xxxxx1xx、赤色光

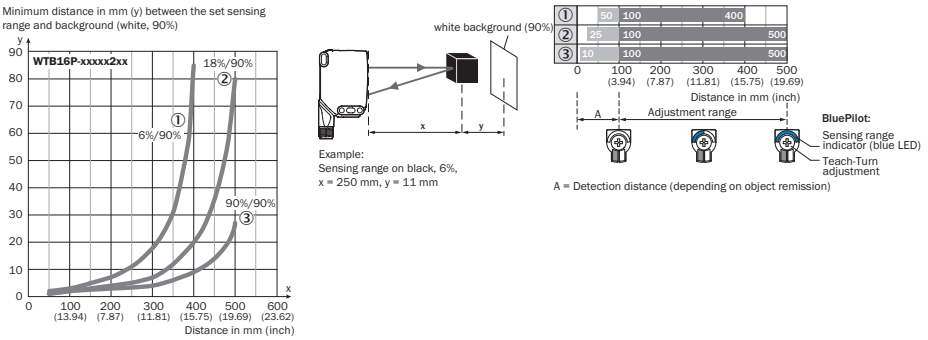


図 76: 特性曲線 2、WTB16P Bluetooth-xxxxx2xx、赤色光

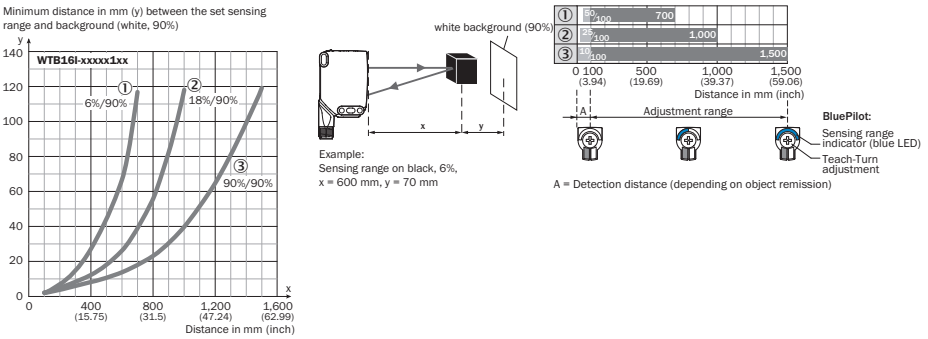


図 77: 特性曲線 3、WTB16I Bluetooth-xxxxx1xx、赤外光

検出距離の設定

プッシュターン要素を備えた WTB16x-xxxxxx2xAxx:
ティーチインボタンを押すと (約 1～3 秒) 検出距離を設定できます。要件に応じて、ポテンショメータで (ティーチインボタンを押さずに) 微調整することができます。
右へ回すと検出距離が増大します。
左へ回すと検出距離が減少します。
検出距離はポテンショメータのみで設定できます。検出距離を対象物内に入れることをお勧めします (例として図 8 を参照)。検出距離が設定された後、対象物を光路から取り除きます。この際、背景は抑制され、スイッチング出力が変化します (表 15, 表 16)。

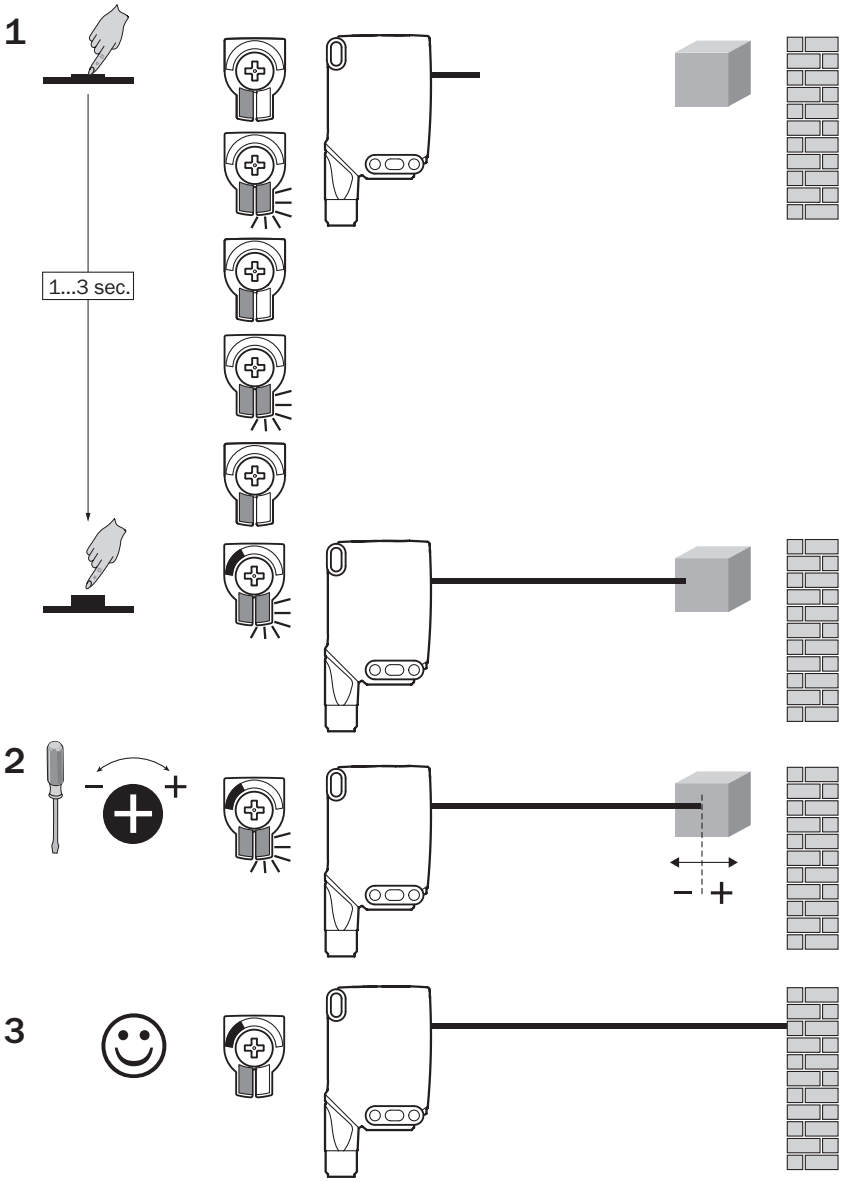


図 78: WTB16x-xxxxxx2xAxx、プッシュターン要素による検出距離の設定

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ポテンショメータを備えた WTB16x-xxxxxx1xAxx:
ポテンショメータで検出距離を設定します。
右へ回すと検出距離が増大します。
左へ回すと検出距離が減少します。
検出距離を対象物内に入れることをお勧めします (例として図 9 を参照)。検出距離が設定された後、対象物を光路から取り除きます。この際、背景は抑制され、スイッチング出力が変化します (表 15, 表 16)。

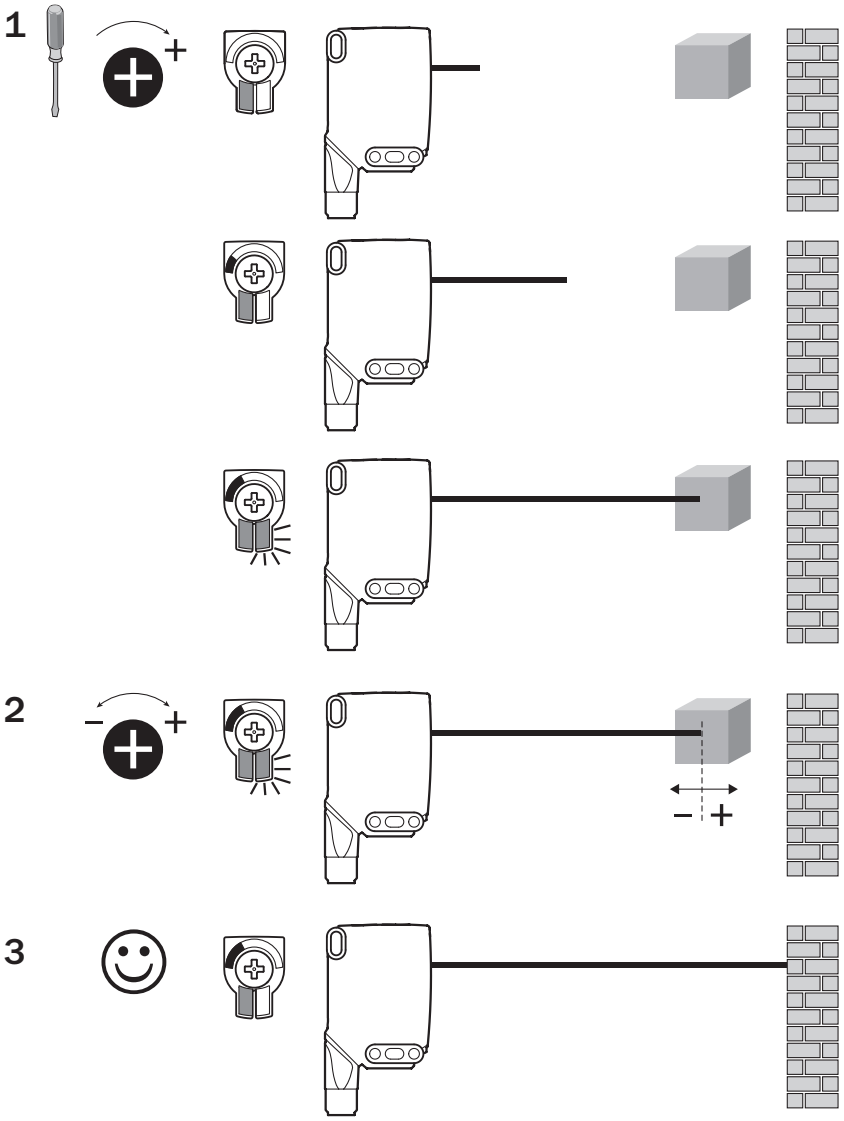

図 79: WTB16x-xxxxxx1xAxx、ポテンショメータによる検出距離の設定

ティーチインボタンを備えた WTB16x-xxxxxx3xAxx:
ティーチインボタンを押すと (約 1〜3 秒) 検出距離を設定できます。検出距離を対象物内に入れることをお勧めします (例として図 10 を参照)。検出距離が設定された後、対象物を光路から取り除きます。この際、背景は抑制され、スイッチング出力が変化します (表 15, 表 16)。

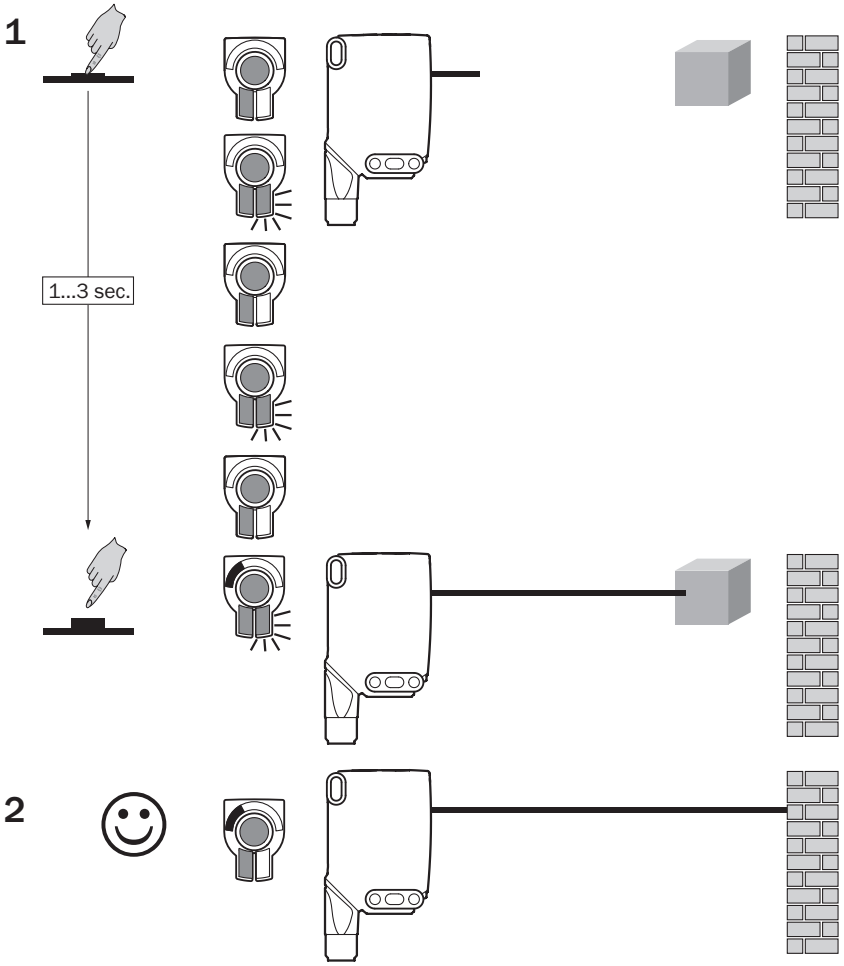

図 80: WTB16x-xxxxxx3xAxx、ティーチインボタンによる検出距離の設定

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プロセスデータ構造 (バージョン 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
プロセスデータ	2 バイト					4 バイト
	バイト 0 : ビット 15... 8 バイト 1: ビット 7... 0					バイト 0: ビット 31... 24 バイト 1: ビット 13... 16 バイト 2 : ビット 15... 8 バイト 3: ビット 7... 0
ビット 0/ データタイプ	Q_{L1} / ブール型					
ビット 1/ データタイプ	Q_{L2} / ブール型			Qint.1 / ブール型	Q_{L2} / ブール型	Qint.1 / ブール型
ビット... / 説明 / データタイプ	2...15 / [空]	2...15 / [時間測定値] / UInt 14	2 ... 15 / [カウンタ値] / UInt 14	2 ... 15 / [長さ / 速度測定] / SInt14	2 / Qint. 1 / ブール型	2...7 / [空]
ビット... / 説明 / データタイプ					3 ...15 / [時間測定値] / UInt13	8 ... 31 / [キャリアロード] / UInt 24

84 トラブルシューティング

トラブルシューティングの表は、センサが機能しなくなった場合に、どのような対策を講じるべきかを示しています。

LED 表示灯/故障パターン	原因	対策
緑色の LED が点滅	IO リンク通信	なし
スイッチング出力がに従った動作を示さない。 表 16	1. IO リンク通信 2. 設定の変更 3. 短絡	1. なし 2. 設定の調整 3. 電気的接続を点検する
黄色い LED が点灯、光軸に対象物がない	検出距離が長する距離に合わせて設定されています	検出範囲を縮小します。
対象物は光軸にある、黄色い LED は点灯しない	センサと対象物の間隔が長すぎる、または検出範囲の設定が短すぎる	検出範囲を拡大します。
SOPASair にセンサが表示されない	1. 他のハンドヘルド機器と接続されている。 2.ハンドヘルドがセンサの投光領域外にある。 3. センサの Bluetooth LE が無効になっている。 4. ハンドヘルドの Bluetooth LE が無効になっている。 5. MAC アドレスフィルタが有効で、ハンドヘルドが承認されていない。	1. 接続がない、または既存の接続の無効化。 2. 取り付け状況の点検 (金属によるシールドなど)。 3. SiLink2 Master または IO-Link 経由による Bluetooth LE の有効化 4. Bluetooth LE の有効化 5. MAC アドレスフィルタがない、またはその変更。

LED 表示灯/故障パターン	原因	対策
センサへの接続を確立できない	1. アンドロイドまたは iOS バージョンが要件を満たしていない。 2. SOPASair バージョンに必要なドライバが含まれていない。	1. オペレーティングシステムを点検してください。 2. SOPASair をアンインストールし、最新のアプリバージョンをインストールしてください。

85 分解および廃棄

センサは必ず該当国の規制にしたがって処分してください。廃棄処理の際には、できるだけ構成材料をリサイクルするよう努めてください（特に貴金属類）。

注意事項

バッテリー、電気および電子デバイスの廃棄

- 国際的指令に従い、バッテリー、アキュムレータ、および電気または電子デバイスは、一般廃棄物として廃棄することはできません。
- 法律により、所有者は、本デバイスの耐用年数の終了時に本デバイスをそれぞれの公的な回収場所まで返却することが義務付けられています。
-  製品、梱包または本文書に記載されているこの記号は、製品がこれらの規制の対象であることを示します。

86 メンテナンス

SICK センサはメンテナンスフリーです。

定期的に以下を行うことをお勧めしています：

- レンズ境界面の清掃
- ネジ締結と差込み締結の点検

機器を改造することは禁止されています。

記載内容につきましては予告なしに変更する場合がございますのであらかじめご了承ください。指定された製品特性および技術データは保証書ではありません。

87 認可

87.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries** Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

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This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

88 技術仕様（抜粋）

88.1 技術仕様（抜粋）

	WTB16P Bluetooth	WTB16I Bluetooth
最大検出範囲	10 mm ... 1.000 mm (タイプ)[1]	10 mm ... 1.500 mm[1]
光点のスポット径/距離	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (タイプ)	Ø 12 mm (800 mm)
供給電圧 U_V	DC 10 ... 30 V	DC 10 ... 30 V
消費電流	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
出力電流 $I_{max.}$	≤ 100 mA	≤ 100 mA
最大応答時間	500 µs[4]	500 µs[4]
スイッチング周波数	1000 Hz[5]	1000 Hz[5]
保護等級	IP66, IP67	IP66, IP67
保護クラス	III	III
回路保護	A, B, C, D[6]	A, B, C, D[6]
周辺温度 (作動中)	–40 °C ... +60 °C	–40 °C ... +60 °C

1 反射率 90 % の対象物（DIN 5033 に準拠した白色）
2 16VDC...30VDC、負荷なし
3 10VDC...16VDC、負荷なし
4 切替モードでの抵抗負荷における信号遷移時間。COM2 モードでは値が異なる場合があります。
5 切替モードで明暗比率 1:1 の場合 IO-Link モードでは値が異なる場合があります。
6 A = U_V 電源電圧逆接保護
B = 出入力 逆接保護
C = 干渉パルス抑制
D = 出力の過電流保護および短絡保護

88.2 Bluetooth の技術仕様®

特徴	値
Bluetooth®通信範囲	距離 100 m
無線タイプ	BLE
無線クラス	2
Bluetooth®モジュールメーカー	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
無線周波数帯域幅	2402～2480 MHz
出力電力	2 dBM
Declaration ID	D033906
Qualified Design ID	89630
Specification Name	4.1
会員企業	SICK AG

РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ

WTB16 Bluetooth®

SICK
Sensor Intelligence.

de
en
es
fr
it
ja
pt
ru
zh

Описание продукта

WTB16 - Bluetooth®

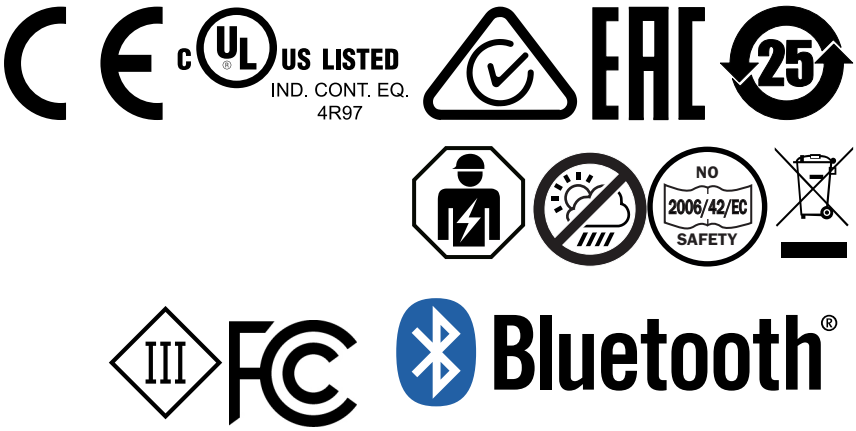
Изготовитель

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Deutschland (Германия)

Правовые примечания

Оригинальный документ

Настоящий документ является оригинальным документом SICK AG.



Содержание

89 Безопасность

89.1 Общие указания по технике безопасности

- Перед вводом в эксплуатацию прочитайте инструкции по эксплуатации.
-  Подключение, монтаж и настройку могут выполнять только квалифицированные специалисты.
- 

Не является компонентом безопасности в соответствии с Директивой ЕС по работе с машинным оборудованием.
-  При вводе в эксплуатацию защищайте устройство от влаги и загрязнений.
- Настоящие инструкции по эксплуатации содержат информацию, необходимую в течение срока эксплуатации датчика.

89.2 Указания по допуску к эксплуатации UL

The device must be supplied by a Class 2 source of supply.

UL Environmental Rating: Enclosure type 1

90 Применение по назначению

WTB16 Bluetooth является фотоэлектрическим датчиком диффузионного типа (в дальнейшем называемым «датчик») и используется для оптической бесконтактной регистрации предметов, животных и людей. В случае использования устройства для иных целей, а также в случае внесения в изделие изменений, любые претензии к компании SICK AG на предоставление гарантии исключаются.

91 Элементы управления и индикаторы

Фотоэлектрический датчик диффузионного типа с подавлением заднего фона.

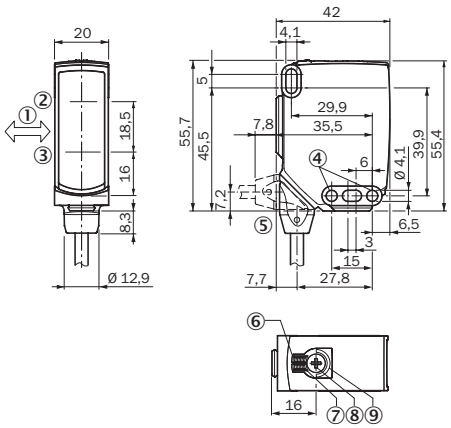


Рисунок 81: Масштабный чертёж 1, кабель

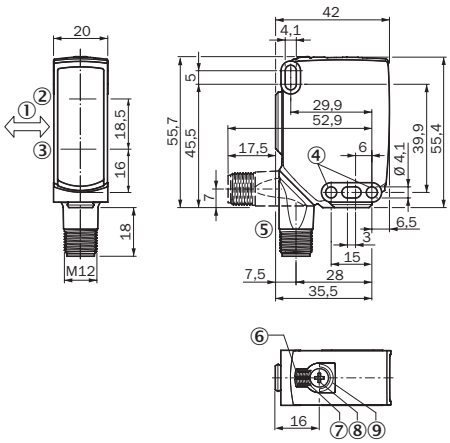


Рисунок 82: Масштабный чертёж 2, штекер

① Предпочтительное направление распознаваемого объекта

② Середина оптической оси передатчика

③ Середина оптической оси приемника

④ Крепёжное отверстие, Ø 4,1 мм

⑤ Соединение

⑥ Светодиодный индикатор, зелёный: напряжение питания включено

⑦ СД-индикатор жёлтый: состояние приёма света

⑧ Поворотно-нажимной элемент: настройка расстояния срабатывания

⑨ BluePilot, синий: индикатор расстояния срабатывания

92 Монтаж

Установите датчик на подходящем крепёжном уголке (см. программу принадлежностей от SICK).

Выдерживайте максимально допустимый момент затяжки датчика в < 1,3 Нм.

Vorzugsrichtung des Objektes zum Sensor beachten, см. рисунок 81, рисунок 82.

93 Электрическое подключение

Подключение датчиков должно производиться при отключенном напряжении питания (U_V = 0 В). В зависимости от типа подключения следует принять во внимание следующую информацию:

- Штекерное соединение: соблюдать расположение выводов.
- Кабель: цвет жилы

Подавать напряжение питания и включать источник напряжения только после завершения подключения всех электрических соединений (U_V > 0 В).

Пояснения к схеме подключений (таблица 17, таблица 18).

MF = (конфигурация контакта 2) внешний вход, обучение, коммутационный сигнал

Q_{L1}/C = переключающий выход, коммуникация IO-Link

Таблица 17: пост. ток

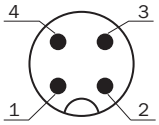
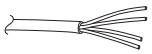
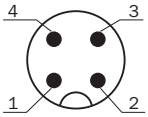
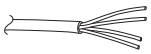
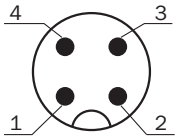
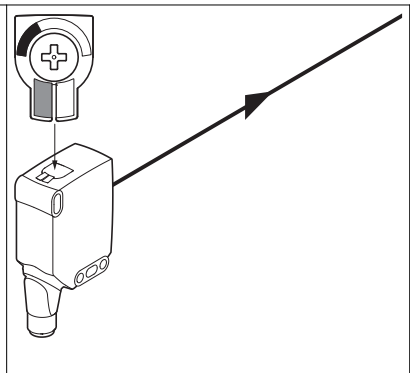
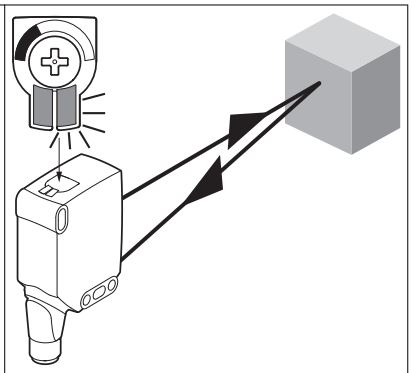
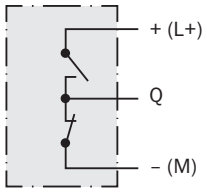
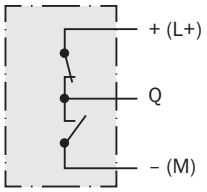
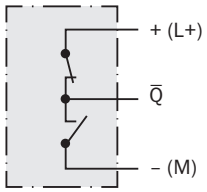
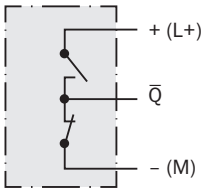
WTB16	-24161xxxA00 -34161xxxA00	-1x161xxxA00	-24162xxxA00 -34162xxxA00	-1x162xxxA00	-2416xxxxA01-A99 -3416xxxxA01-A99
1	+ (L+)				
2	MF				
3	- (M)				
4	Q_{L1}/C				
По умолчанию: MF	$\overline{Q}$	$\overline{Q}$	Q	Q	www.sick.com 8022709
По умолчанию: Q_{L1}/C	Q	Q	$\overline{Q}$	$\overline{Q}$	www.sick.com 8022709
		1 = brn (коричневый) 2 = wht (белый) 3 = blu (синий) 4 = blk (черный)  0,14 мм² AWG26		1 = brn (коричневый) 2 = wht (белый) 3 = blu (синий) 4 = blk (черный)  0,14 мм² AWG26	

Таблица 18: Push / Pull

		
Q push-pull (≤ 100 мА)		

$\overline{Q}$ push-pull (≤ 100 мА)		

94 Ввод в эксплуатацию

Bluetooth® включён при первичном вводе в эксплуатацию. SOPASair Вы найдёте в Google PlayStore (Android) и в App Store (iOS).
Системные требования: Android версии 6.0, последняя версия iOS.

1 **Выравнивание**
WTB16P Bluetooth®: направить датчик на объект. Выберите такую позицию, чтобы красный луч передатчика попадал в центр объекта. Оптическое отверстие (фронтальное стекло) на датчике должно быть полностью свободным [см. рисунок 83,см. рисунок 84].
WTB16I Bluetooth®: направить датчик на объект. Выберите такую позицию, чтобы инфракрасный луч передатчика (он не виден) попадал в центр объекта. Правильность выверки можно определить с помощью светодиодных индикаторов. см. рисунок 83, рисунок 84, см. таблица 17, таблица 18. Оптическое отверстие (фронтальное стекло) на датчике должно быть полностью свободным.

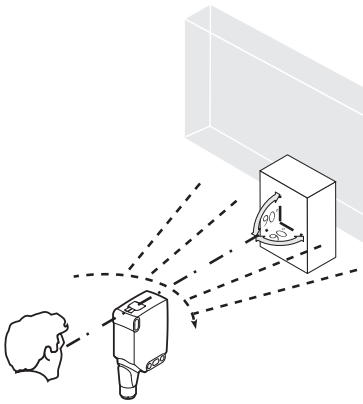


Рисунок 83: Выверка 1

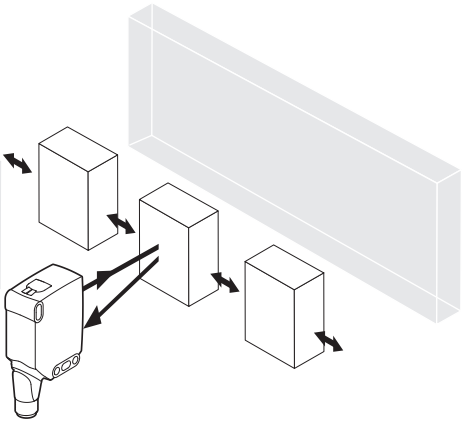


Рисунок 84: Выверка 2

2 **Расстояние срабатывания**
Проверить условия применения: сравнить расстояние срабатывания и дистанцию до объекта или фона, а также яркость объекта с соответствующей диаграммой [см. Рисунки 5 и 7] (x = расстояние срабатывания, y = минимальная дистанция между установленным расстоянием срабатывания и фоном (белый, 90 %)) коэффициент диффузного отражения: 6 % = чёрный ①, 18 % = серый ②, 90 % = белый ③ (относительно стандартного белого по DIN 5033). Мы рекомендуем выполнять настройку с объектом, имеющим низкий коэффициент диффузного отражения. Минимальную дистанцию (= y) для затемнения фона можно определить по диаграмме [рисунок 85 ①] следующим образом:
Пример: x = 400 мм, y = 25 мм. То есть, фон (белый, 90%) затемняется при расстоянии > 25 мм от датчика.

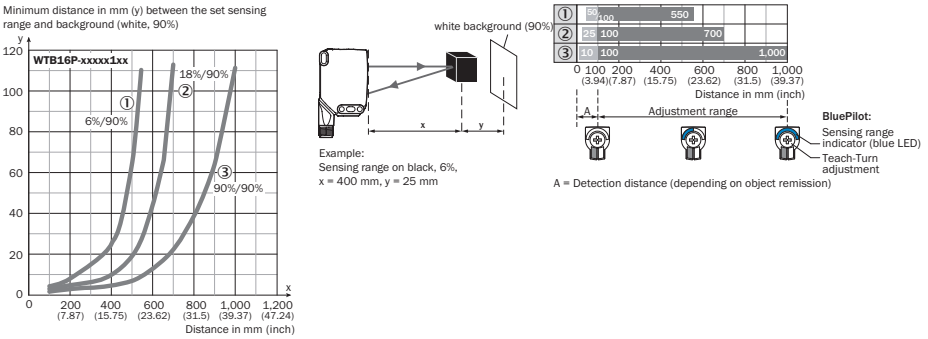


Рисунок 85: Характеристика 1, WTB16P Bluetooth-xxxxx1xx, красный свет

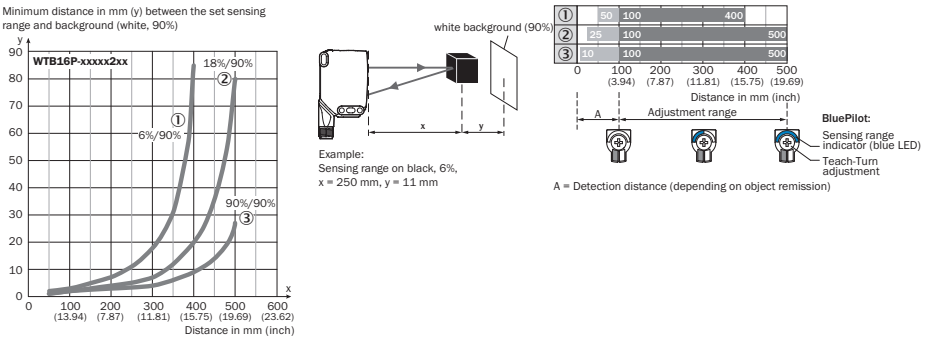


Рисунок 86: Характеристика 2, WTB16P Bluetooth-xxxxx2xx, красный свет

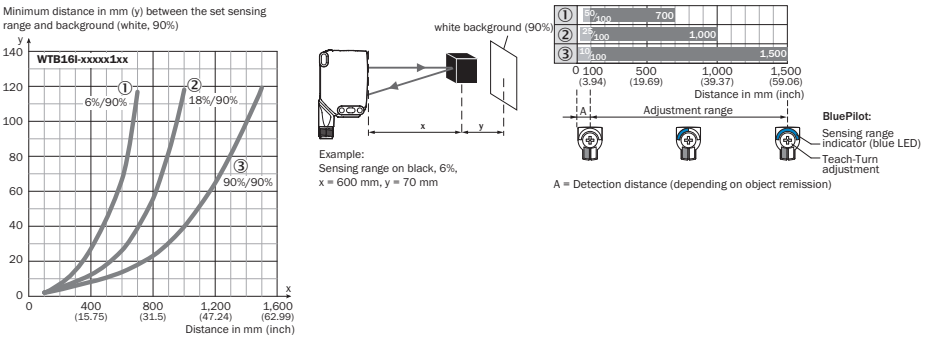


Рисунок 87: Характеристика 3, WTB16I Bluetooth-xxxxx1xx, инфракрасный свет

Настройка расстояния срабатывания

WTB16x-xxxxxx2xAxx с поворотно-нажимным элементом:
Регулировка расстояния срабатывания производится нажатием кнопки Teach-in (примерно 1-3 сек). В зависимости от требований плавная регулировка может производиться с помощью потенциометра (без нажатия кнопки обучения).
Поворот вправо: увеличение расстояния срабатывания.
Поворот влево: уменьшение расстояния срабатывания.
Расстояние срабатывания может быть установлено также исключительно с помощью потенциометра. Мы рекомендуем устанавливать расстояние срабатывания в объекте, например, смотри Рисунок 8. После настройки расстояния срабатывания, удалить объект с траектории луча, при этом затемняется фон и изменяется переключающий выход (таблица 17, таблица 18).

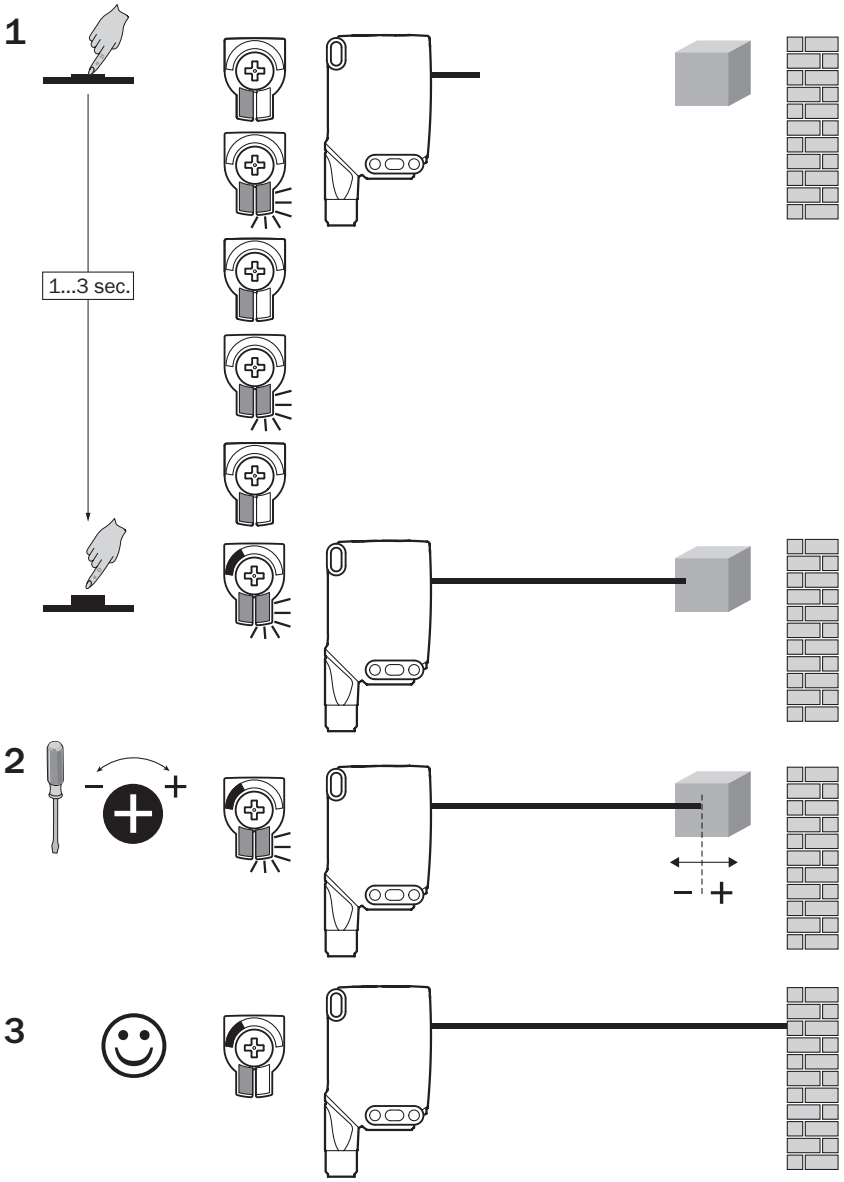


Рисунок 88: WTB16x-xxxxxx2xAxx, настройка расстояния срабатывания с помощью поворотно-нажимного элемента

WTB16x-xxxxxx1xAxx с потенциометром:
С помощью потенциометра регулируется расстояние срабатывания.
Поворот вправо: увеличение расстояния срабатывания.
Поворот влево: уменьшение расстояния срабатывания.
Мы рекомендуем устанавливать расстояние срабатывания в объекте, например, смотри Рисунок 9. После настройки расстояния срабатывания, удалить объект с траектории луча, при этом затемняется фон и изменяется переключающий выход (таблица 17, таблица 18).

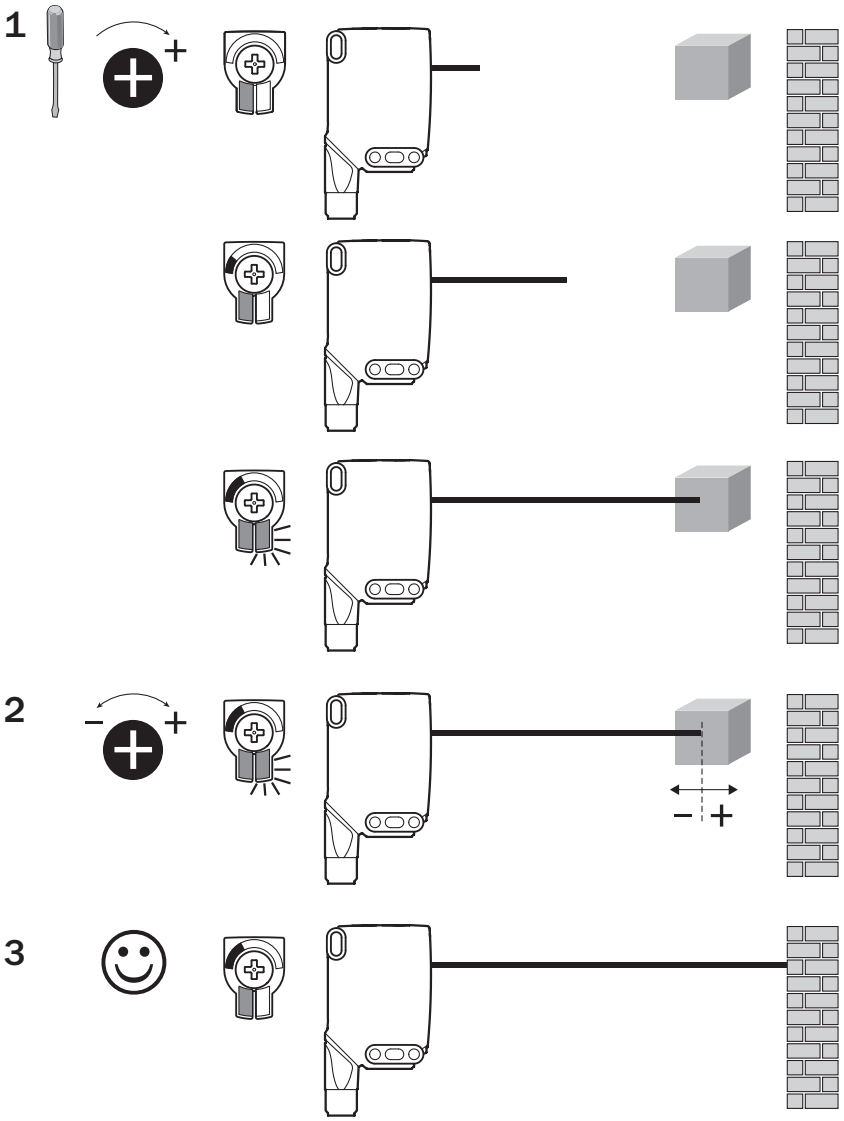


Рисунок 89: WTB16x-xxxxxx1xAxx, настройка расстояния срабатывания с помощью потенциометра

WTB16x, xxxxxx3xAxx, с кнопкой обучения

Регулировка расстояния срабатывания производится нажатием кнопки Teach-in (примерно 1-3 сек). Мы рекомендуем устанавливать расстояние срабатывания в объекте, например, смотри Рисунок 10. После настройки расстояния срабатывания, удалить объект с траектории луча, при этом затемняется фон и изменяется переключающий выход (таблица 17, таблица 18).

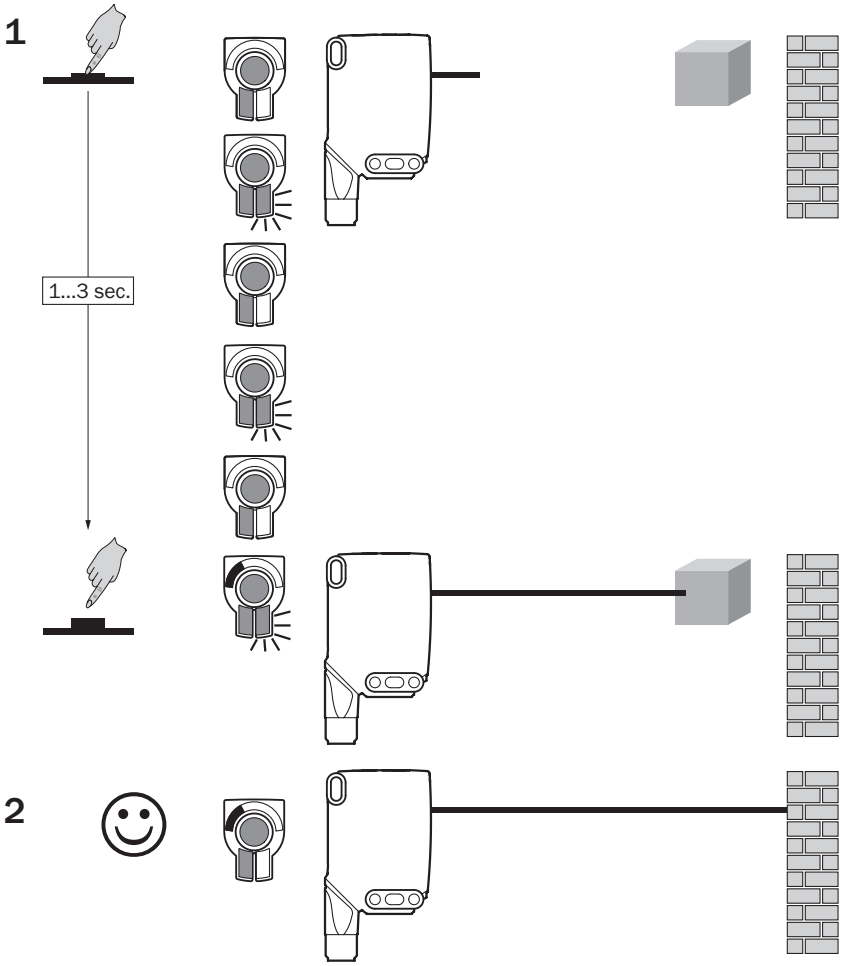


Рисунок 90: WTB16x-xxxxxx3xAxx, настройка расстояния срабатывания с помощью кнопки обучения

Структура данных процесса (версия 1.1)

	A00	A70	A71	A72	A73	A75
IO-Link	V1.1					
Данные процесса	2 байта					4 байта
	0 байт: бит 15... 8 1 байт: бит 7... 0					0 байт : бит 31... 24 1 байт: бит 13... 16 2 байта: бит 15... 8 3 байта: бит 7... 0
0 бит / тип данных	Q_{L1} / Boolean					
1 бит / тип данных	Q_{L2} / Boolean			Qint.1 / Boolean	Q_{L2} / Boolean	Qint.1 / Boolean
Бит... / описание / тип данных	2... 15 / [пусто]	2... 15 / [значение измерения времени] / UInt 14	2... 15 / [значение счётчика] / UInt 14	2... 15 / [измерение длины / скорости] / SInt14	2 / Qint. 1 / Boolean	2... 7 / [пусто]
Бит... / описание / тип данных					3... 15 / [значение измерения времени] / UInt13	8 ... 31 / [пропускная способность] / UInt 24

95 Устранение неисправностей

В таблице Устранение неисправностей показано, какие меры необходимо предпринять, если датчики не работают.

Светодиодный индикатор / картина неисправности	Причина	Меры по устранению
зеленый светодиод мигает	Коммуникация IO-Link	Нет
Коммутационные выходы ведут себя не согласно таблица 18	1. Коммуникация IO-Link 2. Изменение конфигурации 3. Короткое замыкание	1. Нет 2. Адаптация конфигурации 3. Проверка электрических подключений
желтый светодиод горит, объект на пути луча отсутствует	Расстояние срабатывания настроено на слишком большое расстояние	Уменьшить расстояние срабатывания
Объект на пути луча, желтый светодиод не горит	Слишком большое расстояние между сенсором и объектом или установлена слишком малая дистанция переключения	Увеличить расстояние срабатывания
В SOPASair датчик не отображается	1. Подключён к другому ручному сканеру. 2.Ручной сканер находится за пределами радиуса действия передатчика.	1. отсутствует или отключена существующее соединение. 2. Проверка установочного положения (например, экранирование металлом).

Светодиодный индикатор / картина неисправности	Причина	Меры по устранению
	3. Bluetooth LE в датчике деактивирован. 4. Bluetooth LE в ручном сканере деактивирован. 5. Фильтр MAC-адресов активирован, ручной сканер не авторизован.	3. Активация Bluetooth LE через SiLink2 Master или IO-Link 4. Активация Bluetooth LE 5. Отсутствие или изменение фильтра MAC-адресов.
Связь с датчиком не может быть установлена	1. Версия Android или iOS не отвечает требованиям. 2. Версия SOPASair не содержит требуемый драйвер.	1. Проверьте операционную систему. 2. Удаление SOPASair, установите последнюю версию приложения.

96 Демонтаж и утилизация

Датчик должен быть утилизирован в соответствии с действующим законодательством конкретной страны. В процессе утилизации следует прилагать усилия для переработки составляющих материалов (особенно драгоценных металлов).

УКАЗАНИЕ

Утилизация батарей, электрических и электронных устройств

- В соответствии с международными директивами батареи, аккумуляторы и электрические или электронные устройства не должны выбрасываться в общий мусор.
- По закону владелец обязан вернуть эти устройства в конце срока их службы в соответствующие пункты общественного сбора.
-  Этот символ на изделии, его упаковке или в данном документе указывает на то, что изделие подпадает под действие настоящих правил.

97 Техобслуживание

Датчики SICK не нуждаются в техобслуживании.

Рекомендуется регулярно

- очищать оптические ограничивающие поверхности
- проверять прочность резьбовых и штекерных соединений

Запрещается вносить изменения в устройства.

Право на ошибки и внесение изменений сохранено. Указанные свойства изделия и технические характеристики не являются гарантией.

98 Допуски

98.1 Bluetooth® approvals

Country	Comments
Canada	IC: 21147-W16
USA	FCC ID: 2AHDR-W16
Europe + EFTA	**EU countries**

Country	Comments
	Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY). **EFTA countries** Iceland, Liechtenstein, Norway, Switzerland

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by SICK AG may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

99 Технические характеристики

99.1 Технические характеристики

	WTB16P Bluetooth	WTB16I Bluetooth
Расстояние срабатывания, макс.	10 mm ... 1.000 mm (тип)[1]	10 mm ... 1.500 mm[1]
Диаметр светового пятна/расстояние	Ø 3 mm (200 mm), Ø 6 mm (500 mm) (тип)	Ø 12 mm (800 mm)
Напряжение питания U_V	DC 10 ... 30 V	DC 10 ... 30 V
Потребляемый ток	≤ 30 mA[2] < 50 mA[3]	≤ 30 mA[2] < 50 mA[3]
Выходной ток $I_{макс.}$	≤ 100 mA	≤ 100 mA
Время отклика макс.	500 µs[4]	500 µs[4]
Частота переключения	1000 Hz[5]	1000 Hz[5]
Класс защиты	IP66, IP67	IP66, IP67
Класс защиты	III	III
Схемы защиты	A, B, C, D[6]	A, B, C, D[6]
Диапазон рабочих температур	–40 °C ... +60 °C	–40 °C ... +60 °C

1 Сканируемый объект – ремиссия 90 % (относительно стандартного белого по DIN 5033)
2 16 ... 30 В пост. тока, без нагрузки
3 10 ... 16 В пост. тока, без нагрузки
4 Продолжительность сигнала при омической нагрузке в режиме переключения. Возможны другие значения в режиме COM2.
5 При соотношении «светло/темно» 1:1, в режиме переключения. Возможны другие значения в режиме IO-Link.
6 A = U_V-подключения с защитой от перепутывания полюсов
B = входы и выходы с защитой от перепутывания полюсов
C = подавление импульсных помех
D = выходы защищены от перенапряжения и короткого замыкания

99.2 Технические характеристики Bluetooth®

Отличительные свойства	Значения
Bluetooth® Расстояние срабатывания	100 м по траектории
Вид радио	BLE
Класс радио	2
Производитель Bluetooth® модуль	BROADCOM Cypress Semiconductor Corporation 198 Champion Court San Jose CA 95134-1709
Диапазон радиовещания	2402 - 2480 МГц
Выходная мощность	2 дБм
Declaration ID	D033906
Qualified Design ID	89630
Specification Name	4.1
Компания-член	SICK AG

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