microsonic

Operating manual

sks-15/CF/A

Ultrasonic proximity switch with one switching output and IO-Link interface

IO-Link

Product description

The sks sensor offers a non-contact-measurement of the distance to an object which must be positioned within the sensor's detection zone. The switching output is set in dependance of the adjusted detect distance.

Via the push-button, the distance and operating mode can be adjusted (Teach-in). Two LEDs indicate the state of the switching output.

The output function is changeable from NOC to NCC.

IO-Link

The sks sensor is IO-Link-capable in accordance with IO-Link specification V1.1 and supports Smart Sensor Profile like Digital Measuring Sensor.

Safety notes

- **Read operating instructions pior to start-up.**
- **Connection, installation and adjustment works may only be carried out by expert personnel**
- **No safety component according to EU Machinery Directive**

Proper use

sks ultrasonic sensors are used for non-contact detection of objects.

Installation

- Mount the sensor at installation site, Maximum torque: 0.5 Nm
- Connect a connection cable to the M8 device plug, see figure 1.

Start-Up

- Connect the power supply
- Set the parameters of the sensor using the Teach-in procedure, see diagram »Set sensor parameters with the Teach-in procedure«.

Factory setting

- Operating with one switching point
- Switching output on NOC
- Switching points at operating range
- Filter F01
- Filter strength P00

		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	F	black
2	d.n.c.*	white

*Do not connect

Fig. 1: Pin assignment with view of the sensor plug and color coding of the microsonic connection cables

Operating modes

Three operating modes are available for the switching output:

- **Operation with one switching point**

The switching output is set if the object falls below the set switching point.

- **Window mode**

The switching output is set if the object is inside the set window llimits.

- **Two-way reflective barrier**

The switching output is set if no object is located between the sensor and reflector.

Checking operation mode

- In normal mode shortly press the push-button.

The green LED stops shining for one second, then it will show the current operating mode:

1 x flashing = operation with one switching point
2 x flashing = window mode
3 x flashing = reflective barrier

After a break of three seconds, the green LED shows the **output function**:

1 x flashing = NOC
2 x flashing = NCC

Maintenance

microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend cleaning the white sensor surface.

Notes

- Every time the power supply is switched on, the sensor detects its actual operating temperature and transmits it to the internal temperature compensation. The adjusted value is taken over after 45 seconds.
- If the sensor was switched off for at least 30 minutes and after power on the the switching output is not set for 30 minutes a new adjustment of the internal temperature compensation to the actual mounting conditions takes place.
- The sks sensor has a blind zone whitin which distance measurements are not possible.
- In the normal operating mode, an illuminated yellow LED signals the switching output is switched through.

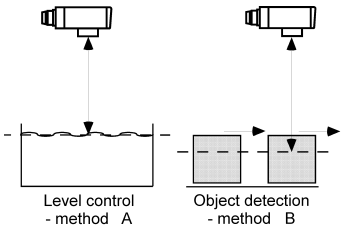
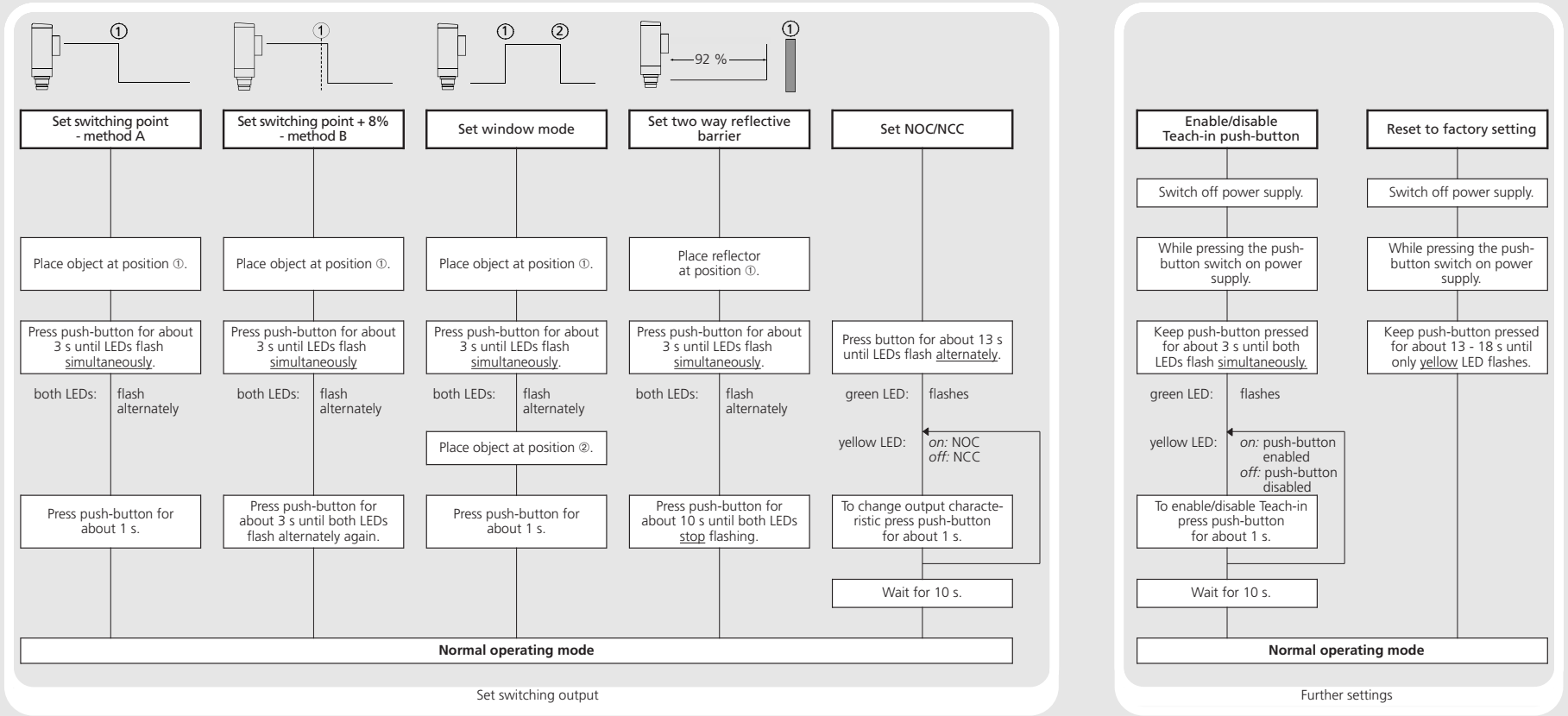


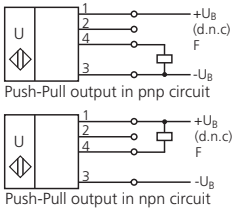
Fig. 2: Adjustment of the switching point when the object moves in different directions

- In the »Set switching point – method A« Teach-in procedure the actual distance to the object is taught to the sensor as the switching point. If

Set sensor parameters with Teach-in procedure

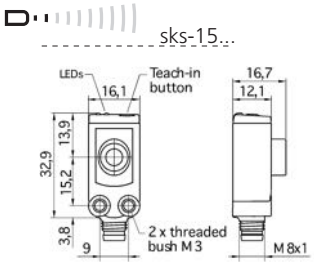


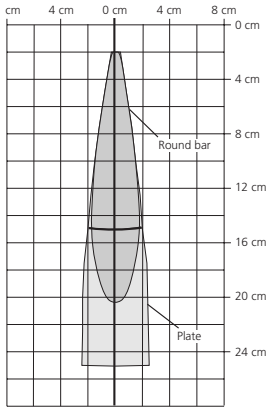
Technical data



Push-Pull output in pnp circuit

Push-Pull output in npn circuit



blind zone	20 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	See detection zone
transducer frequency	380 kHz
resolution	0.10 mm
reproducibility	± 0.15 %
detection zones for different objects: The dark grey areas are determined with a thin round bar (10 mm dia.) and indicate the typical operating range of a sensor. In order to obtain the light grey areas, a plate (100 x 100 mm) is introduced into the beam spread from the side. In doing so, the optimum angle between plate and sensor is always employed. This therefore indicates the maximum detection zone of the sensor. It is not possible to evaluate ultrasonic reflections outside this area.	
accuracy	± 1% (Temperature drift internal compensated)
operating voltage U_B	10 - 30 V DC, reverse polarity protection
voltage ripple	±10 %
no-load current consumption	< 30 mA
housing	ABS
	ultrasonic transducer: polyurethane foam,
	epoxy resin with glass content
class of protection to EN 60 529	IP 67
type of connection	4-pin M8 initiator plug
controls	Teach-in push-button
scope of settings	IO-Link, Teach-in via push-button
indicators	1 x LED green
	1 x LED yellow
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	8 g
switching hysteresis	2 mm
switching frequency	25 Hz
response time	32 ms
time delay before availability	< 300 ms
norm conformity	EN 60947-5-2
order no.	**sks-15/CF/A**
switching output	Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA
	switchable NOC/NCC, short-circuit-proof

the object moves towards the sensor (e.g. with level control) then the taught distance is the level at which the sensor has to switch the output.

- If the object to be scanned moves into the detection area from the side, the »Set switching point +8 % – method B« Teach-in procedure should be used. In this way the switching distance is set 8 % further than the actual measured distance to the object. This ensures a reliable switching distance even if the height of the objects varies slightly, see figure 2.
- In the »Two-way reflective barrier« operating mode, the object has to be within the range of 0-92 % of the set distance.
- If the push-button is not pressed for 30 seconds during the teach-in setting, the settings made hitherto are deleted.
- The sensor can be reset to its factory setting.

Notes on IO-Link

- For further information on IO-Link, please contact microsonic sales.
- The current IODD library and information on start-up with IO-Link are available on the Internet at www.microsonic.de/en/sks.

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