



Operating manual

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

Ics+340/F/A
Ics+600/F/A

Product description

The Ics+ sensor offers a non-contact measurement of the distance to an object which must be positioned within the sensor's detection zone. The switched output is set conditional upon the adjusted detect distance.

Via the Teach-in procedure, the detect distance and operating mode can be adjusted. One LED indicates operation and the state of the switched output.

The Ics+ sensors are IO-Link-capable in accordance with IO-Link specification V1.1 and support Smart Sensor Profile like Digital Measuring Sensor.

Safety instructions

- Read the operating instructions prior to start-up.

- Connection, installation and adjustments may only be carried out by qualified staff.
- No safety component in accordance with the EU Machine Directive.

Use for intended purpose only

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

Installation

- Mount the sensor at the place of fitting.
- Connect a connection cable to the M12 device plug.

Start-up

- Connect the power supply.
- Carry out sensor adjustment in accordance with the diagram.

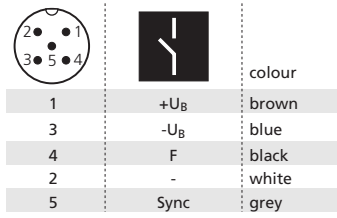


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cables

Factory setting

- Switched output on NOC.
- Detect distance at operating range.

Operating modes

Three operating modes are available for the switched output:

- Operation with one detect point
The switched output is set when the object falls below the set detect point.
- Window mode
The switched output is set when the object is within the set window.
- Two-way reflective barrier
The switched output is set when the object is between sensor and fixed reflector.

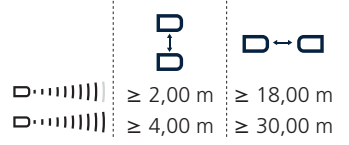


Fig. 2: Assembly distances

Synchronisation

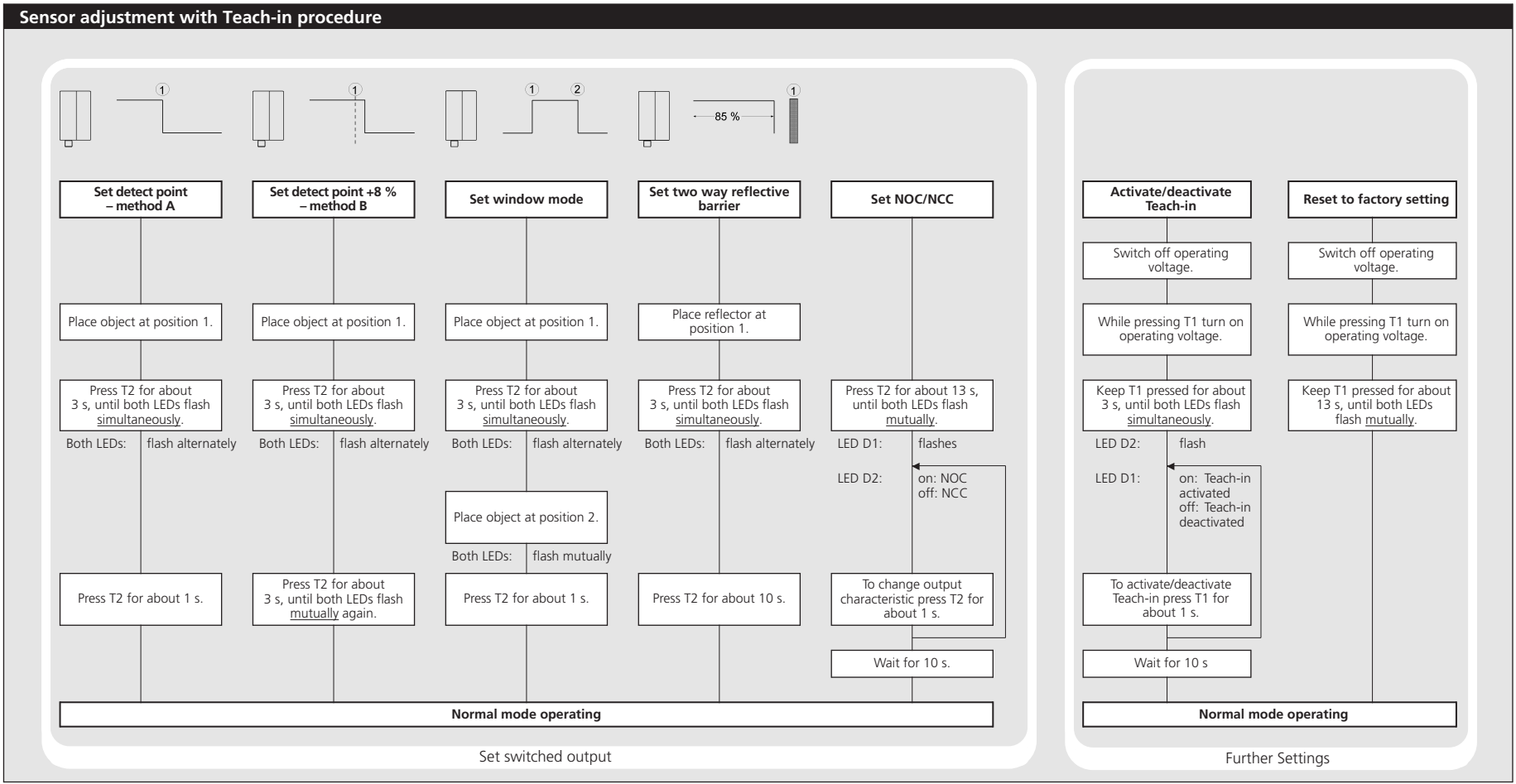
If under multiple sensor operation the assembly distance falls below the values shown in Fig. 2, the internal synchronisation should be used. For this purpose interconnect each pin 5 of max. 10 sensors.

Maintenance

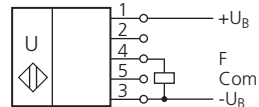
microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend cleaning the white sensor surface.

Notes

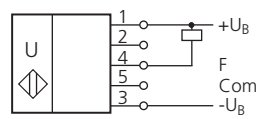
- The sensors of the Ics+ family have a blind zone, within which a distance measurement is not possible.
- The Ics+ sensors are equipped with an internal temperature compensation. Due to the sensors self heating, the temperature compensation reaches its optimum working-point after approx. 30 minutes of operation.
- In the normal operating mode, an illuminated yellow LED signals that the switched output is switched through.
- The Ics+ sensors have a push-pull switched output.
- In the »Two-way reflective barrier« operating mode, the object has to be within the range of 0-85 % of the set distance.
- In the »Set detect point – method A« Teach-in procedure the actual distance to the object is taught to the sensor as the detect point. If 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 detect 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.



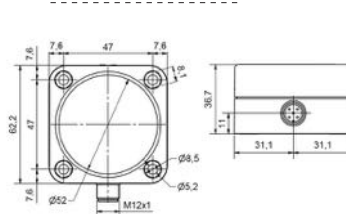
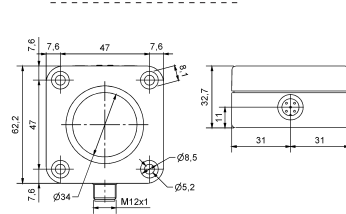
Technical data



Push-Pull output in pnp circuit



Push-Pull output in npn circuit



blind zone 0 to 350 mm

operating range 3,400 mm

maximum range 5,000 mm

angle of beam spread see »detection zones«

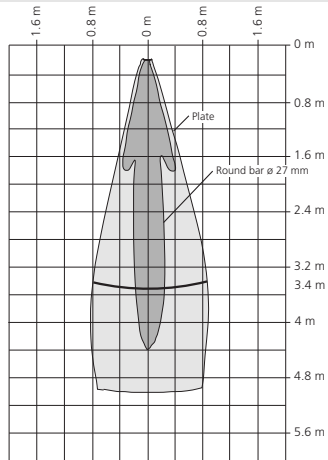
transducer frequency 120 kHz

resolution 0.18 mm

reproducibility ± 0.15 %

detection zones

for different objects:
The dark grey areas represent the zone where it is easy to recognise the normal reflector (round bar). This indicates the typical operating range of the sensors. The light grey areas represent the zone where a good reflector – for instance a plate – can still be recognised. The requirement here is for an optimum alignment to the sensor. It is not possible to evaluate ultrasonic reflections outside this area.



blind zone 0 to 600 mm

operating range 6,000 mm

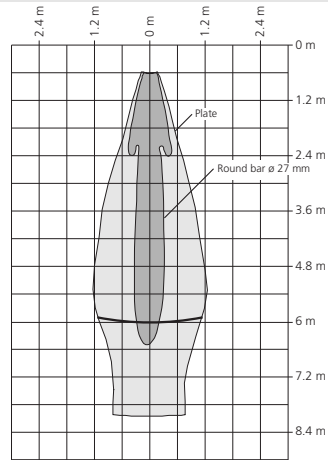
maximum range 8,000 mm

angle of beam spread see »detection zones«

transducer frequency 80 kHz

resolution 0.18 mm

reproducibility ± 0.15 %



accuracy ±1 % (temperature drift internally compensated; may be deactivated, 0.17 %/K without compensation)

operating voltage U_B 9 V to 30 V DC, reverse polarity protection

voltage ripple ±10 %

no-load current consumption ≤ 60 mA

housing

PBT, Polyester; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

class of protection per EN 60 529 IP 67

type of connection 5-pin M12 circular plug, PBT

controls 2 push-buttons

programmable • Teach-in via push-buttons

• LCA-2 with LinkControl

indicators LED yellow/green (switched output set/not set)

synchronisation internal synchronisation up to 10 sensors

operating temperature -25°C to +70°C

storage temperature -40°C to +85°C

weight

1) 180 g

switching hysteresis 1) 50 mm

switching frequency 1) 4 Hz

response time 1) 172 ms

time delay before availability 1) < 380 ms

norm conformity EN 60947-5-2

order no. lcs+340/F/A

switched output Push-Pull, U_B -3 V, $-U_B$ +3 V, I_{max} = 100 mA

NOC/NCC adjustable, short-circuit-proof

accuracy ±1 % (temperature drift internally compensated; may be deactivated, 0.17 %/K without compensation)

operating voltage U_B 9 V to 30 V DC, reverse polarity protection

voltage ripple ±10 %

no-load current consumption ≤ 60 mA

housing

PBT, Polyester; ultrasonic transducer: polyurethane foam, epoxy resin with glass content

class of protection per EN 60 529 IP 67

type of connection 5-pin M12 circular plug, PBT

controls 2 push-buttons

programmable • Teach-in via push-buttons

• LCA-2 with LinkControl

indicators LED yellow/green (switched output set/not set)

synchronisation internal synchronisation up to 10 sensors

operating temperature -25°C to +70°C

storage temperature -40°C to +85°C

weight

1) 240 g

switching hysteresis 1) 100 mm

switching frequency 1) 3 Hz

response time 1) 240 ms

time delay before availability 1) < 450 ms

norm conformity EN 60947-5-2

order no. lcs+600/F/A

switched output Push-Pull, U_B -3 V, $-U_B$ +3 V, I_{max} = 100 mA

NOC/NCC adjustable, short-circuit-proof

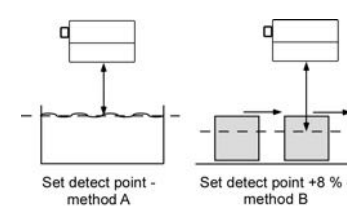


Fig. 4: Setting the detect point for different directions of movement of the object

- The sensor can be reset to its factory setting (see »Further settings«).
- Using the LinkControl adapter (optional accessory) and the LinkControl software for Windows, all Teach-in and additional sensor parameter settings can be optionally undertaken.
- The latest IODD file and information about start-up and configuration of lcs+ sensors with IO-Link, you will find online at: www.microsonic.de/lcs+.
- For further information on IO-Link see www.io-link.com.

1) Can be programmed with LinkControl and IO-Link

