



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 switching 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 switching 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.

Operating manual
Ultrasonic proximity switch with one switching output and IO-Link

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



■ No safety component in accordance with the EU Machine Directive, use in the area of personal and machine protection not permitted.

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

	+U _B	brown
	-U _B	blue
	F	black
	-	white
	Sync/Com	grey

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

Installation
 → Mount the sensor at the place of fitting.
 → Connect a connection cable to the M12 device plug, see Fig. 1.

Start-up
 → Connect the power supply.
 → Set the parameters of the sensor, see Diagram 1.

Factory setting
 ■ Switching output on NOC
 ■ Detect distance at operating range

Operating Modes
 Three operating modes are available for the switching output:

■ **Operation with one switching point**
 The switching output is set when the object falls below the set switching point.

■ **Window mode**
 The switching output is set when the object is within the window limits.

■ **Two-way reflective barrier**
 The switching output is set when the object is between sensor and fixed reflector.

Ics+340...	≥2.00 m	≥18.00 m
Ics+600...	≥4.00 m	≥30.00 m

Fig. 2: Minimal assembly distances without synchronisation

Synchronisation
 If the assembly distance of multiple sensors falls below the values shown in Fig. 2, the internal synchronisation should be used. For this purpose set the switching outputs of all sensors in accordance with Diagram 1. Finally interconnect each pin 5 of the sensors to be synchronised.

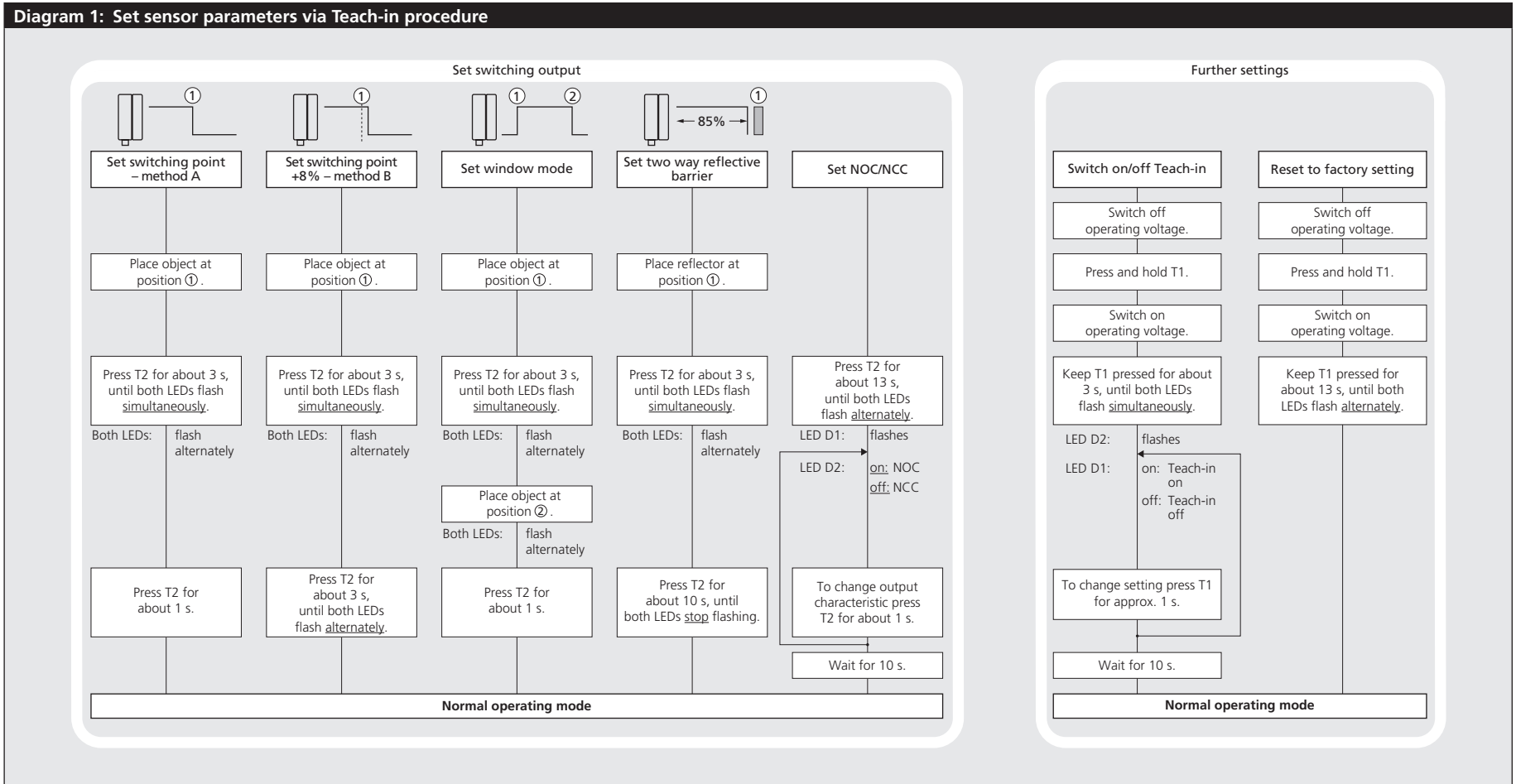
Maintenance
 microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend to clean the white sensor surface.

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.

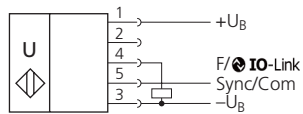
■ In the normal operating mode, an illuminated yellow LED signals that the switching output is switched through.
 ■ The Ics+ sensors have a push-pull switching output.

■ 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.

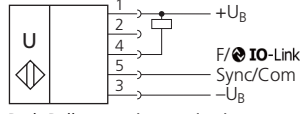
■ If the object to be scanned moves into the detection area from the side, the »Set detect point +8 % – method B« Teach-in procedure should be used. In this way the switching distance is set 8 % further than the actual measured distance to the object. This ensures a reliable switching distance even if the height of the objects varies slightly.



Technical data

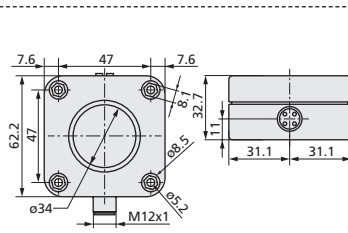


Push-Pull output in pnp circuit

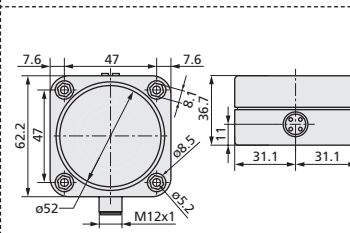


Push-Pull output in npn circuit

lcs+340...

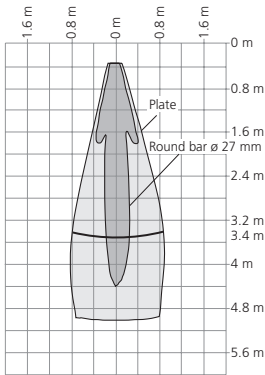


lcs+600...

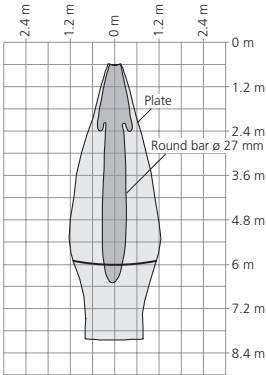


blind zone: 0 to 350 mm
operating range: 3,400 mm
maximum range: 5,000 mm
angle of beam spread: see detection zones
transducer frequency: 120 kHz
resolution: 0.18 mm
reproducibility: ±0.15 %
detection zones

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 very large 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 %
detection zones



accuracy: ±1 % (temperature drift internally compensated; can be deactivated ¹⁾, 0,17 %/K without compensation)
operating voltage U_B: 9 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 IP 67
class of protection per EN 60529: 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, IO-Link
indicators: 2 LEDs yellow/green
 (switching output set/not set)
synchronisation: internal synchronisation up to 10 sensors
operating temperature: -25 to +70 °C
storage temperature: -40 to +85 °C
weight: 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

accuracy: ±1 % (temperature drift internally compensated; can be deactivated ¹⁾, 0,17 %/K without compensation)
operating voltage U_B: 9 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 IP 67
class of protection per EN 60529: 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; IO-Link
indicators: 2 LEDs yellow/green
 (switching output set/not set)
synchronisation: internal synchronisation up to 10 sensors
operating temperature: -25 to +70 °C
storage temperature: -40 to +85 °C
weight: 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+340/F/A
switching output: Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA
 NOC/NCC adjustable, short-circuit-proof

order no.: lcs+600/F/A
switching output: Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA
 NOC/NCC adjustable, short-circuit-proof

¹⁾ Can be programmed via LinkControl and IO-Link.

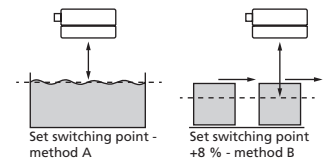


Fig. 3: Setting the detect point for different directions of movement of the object

- 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 informations on IO-Link see www.io-link.com.

