



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

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 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.

- Safety Notes**
- Read the operating manual 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 in the area of personal and machine protection not permitted.

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

		<b>colour</b>
1	+U <sub>B</sub>	brown
3	-U <sub>B</sub>	blue
4	F	black
2	-	white
5	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.

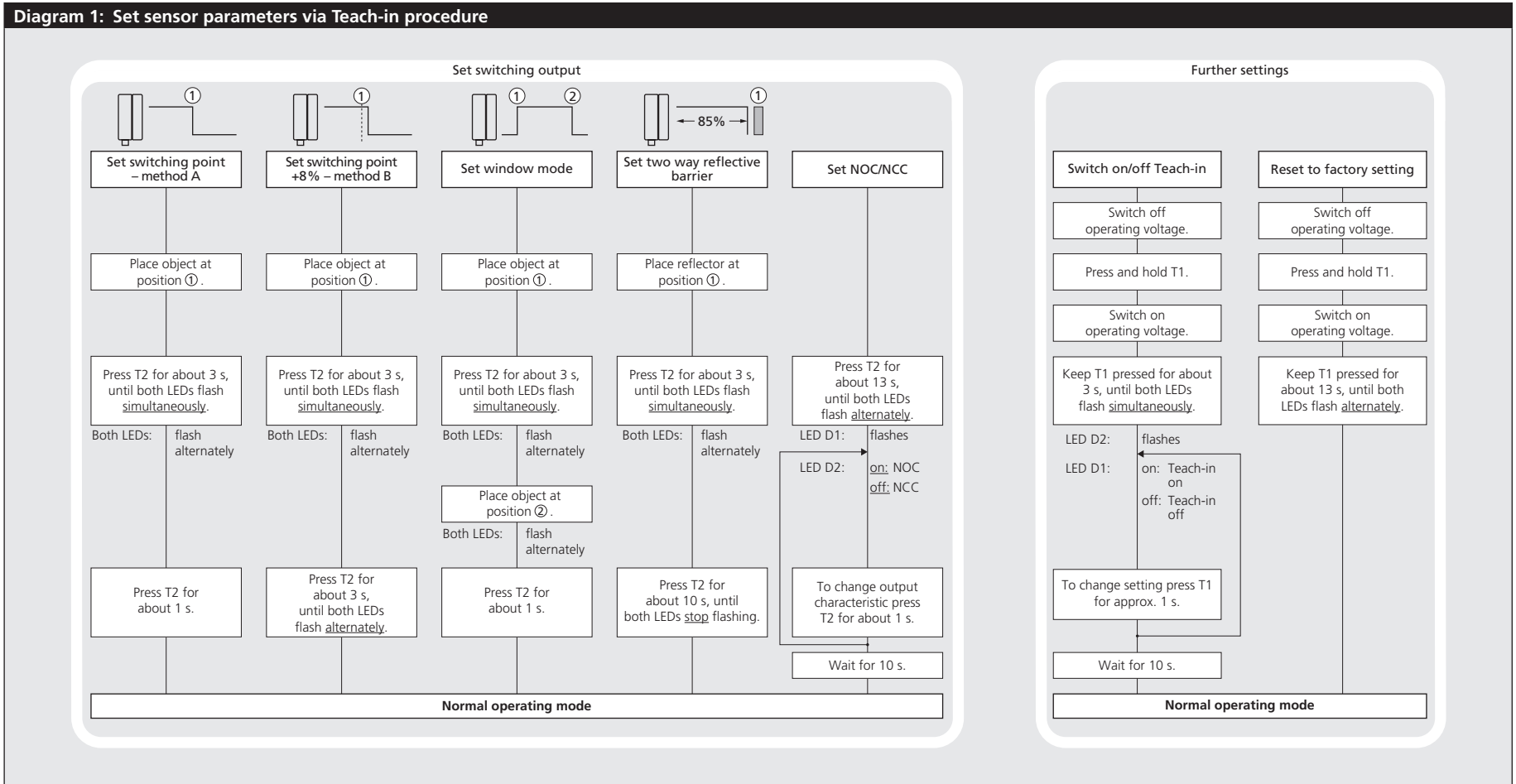
- In the normal operating mode, an illuminated yellow LED signals that the switching output is switched through.

- 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.



**Further settings**

**Switch on/off Teach-in**

Switch off operating voltage.

Press and hold T1.

Switch on operating voltage.

Keep T1 pressed for about 3 s, until both LEDs flash simultaneously.

LED D2: flashes

LED D1: on: Teach-in on  
off: Teach-in off

To change setting press T1 for approx. 1 s.

Wait for 10 s.




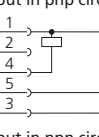
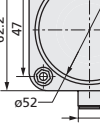

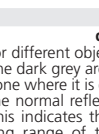
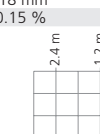
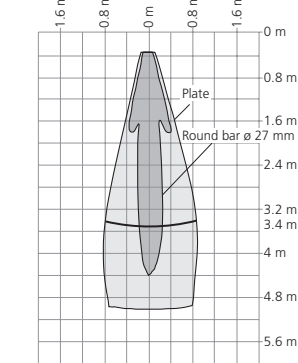
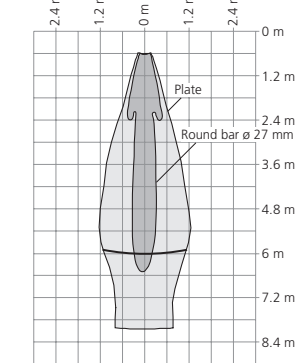
**Reset to factory setting**

Switch off operating voltage.

Press and hold T1.

Switch on operating voltage.

Keep T1 pressed for about 13 s, until both LEDs flash alternately.

	lcs+340... 	lcs+600... 
		
Push-Pull output in pnp circuit		
		
Push-Pull output in npn circuit		
<b>blind zone</b>	0 to 350 mm	0 to 600 mm
<b>operating range</b>	3,400 mm	6,000 mm
<b>maximum range</b>	5,000 mm	8,000 mm
<b>angle of beam spread</b>	see detection zones	see detection zones
<b>transducer frequency</b>	120 kHz	80 kHz
<b>resolution</b>	0.18 mm	0.18 mm
<b>reproducibility</b>	±0.15 %	±0.15 %
<b>detection zones</b>	<p>for different objects:</p> <p>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.</p>	
		
<b>accuracy</b>	±1 % (temperature drift internally compensated; can be deactivated <sup>1)</sup> , 0.17 %/K without compensation)	±1 % (temperature drift internally compensated; can be deactivated <sup>1)</sup> , 0.17 %/K without compensation)
<b>operating voltage U<sub>B</sub></b>	9 to 30 V DC, reverse polarity protection	9 to 30 V DC, reverse polarity protection
<b>voltage ripple</b>	±10 %	±10 %
<b>no-load current consumption</b>	≤60 mA	≤60 mA
<b>housing</b>	PBT, Polyester; ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67	PBT, Polyester; ultrasonic transducer: polyurethane foam, epoxy resin with glass content IP 67
<b>class of protection per EN 60529</b>	5-pin M12 circular plug, PBT	5-pin M12 circular plug, PBT
<b>type of connection</b>	2 push-buttons	2 push-buttons
<b>controls</b>	Teach-in via push-buttons	Teach-in via push-buttons
<b>programmable</b>	LCA-2 with LinkControl, IO-Link	LCA-2 with LinkControl; IO-Link
<b>indicators</b>	2 LEDs yellow/green (switching output set/not set)	2 LEDs yellow/green (switching output set/not set)
<b>synchronisation</b>	internal synchronisation up to 10 sensors	internal synchronisation up to 10 sensors
<b>operating temperature</b>	-25 to +70 °C	-25 to +70 °C
<b>storage temperature</b>	-40 to +85 °C	-40 to +85 °C
<b>weight</b>	180 g	240 g
<b>switching hysteresis <sup>1)</sup></b>	50 mm	100 mm
<b>switching frequency <sup>1)</sup></b>	4 Hz	3 Hz
<b>response time <sup>1)</sup></b>	172 ms	240 ms
<b>time delay before availability <sup>1)</sup></b>	<380 ms	<450 ms
<b>norm conformity</b>	EN 60947-5-2	EN 60947-5-2
<b>order no.</b>	<b>lcs+340/F/A</b>	<b>lcs+600/F/A</b>
<b>switching output</b>	Push-Pull, U <sub>B</sub> -3 V, -U <sub>B</sub> +3 V, I <sub>max</sub> = 100 mA NOC/NCC adjustable, short-circuit-proof	Push-Pull, U <sub>B</sub> -3 V, -U <sub>B</sub> +3 V, I <sub>max</sub> = 100 mA NOC/NCC adjustable, short-circuit-proof

<sup>1)</sup> Can be programmed via LinkControl and IO-Link.

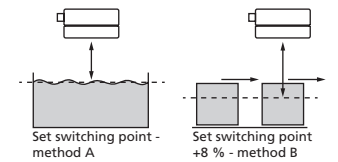


Fig. 3: Setting the detect point for different directions of movement of the object

- 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 informations about start-up and configuration of Ics+ sensors with IO-Link, you will find online at: [www.microsonic.de/Ics+](http://www.microsonic.de/Ics+).
- For further informations on IO-Link see [www.io-link.com](http://www.io-link.com).