**Operating manual**

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

**lcs+340/F/A**

**lcs+600/F/A**

**Product description**

The lcs+ 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 conditionally 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 lcs+ 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**

lcs+ 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.
- Activate/deactivate Teach-in

**Factory setting**

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

**Start-up**

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

**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.

**Notes**

- The sensors of the lcs+ family have a blind zone, within which a distance measurement is not possible.
- The lcs+ 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 lcs+ 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.

**Sensor adjustment with Teach-in procedure**

![Sensor adjustment diagram](image)

**Operating modes**

Three operating modes are available for the switched output:

- **Normal mode operating**
  - Set detect point – method A
  - Set detect point +8 % – method B
  - Set window mode
  - Set two way reflective barrier
  - Set NOC/NCC

- **Further Settings**
  - Switch off operating voltage.
  - While pressing T1 turn on operating voltage.

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

**Fig. 2:** Assembly distances

- **Activate/deactivate Teach-in**
  - LED D1: flashes: Teach-in activated
  - LED D1: on: Teach-in activated
  - LED D1: off: Teach-in deactivated

- **Reset to factory setting**
  - LED D2: flashes: Teach-in deactivated
  - LED D2: on: NOC
  - LED D2: off: NCC

**Notes**

- We recommend cleaning the white sensor surface.

**Maintenance**

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

**Operation**

- The sensors of the lcs+ family have a blind zone, within which a distance measurement is not possible.
- The lcs+ 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 lcs+ 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

blind zone
operating range
maximum range
angle of beam spread
transducer frequency
resolution
reproducibility

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.

transducer frequency
resolution
reproducibility

detection zones
for different objects:

accuracy
operating voltage $U_B$
no-load current consumption
housing
class of protection per EN 60 529
type of connection
controls
programmable
indicators
synchronisation
operating temperature
storage temperature
weight
switching hysteresis
switching frequency
response time
time delay before availability
norm conformity
order no.
switched output

1) Can be programmed with LinkControl and IO-Link

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 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.

*B13495*

MV-DO-198383-618498

customonic GmbH / Phoenixseestraße 7 / 44263 Dortmund / Germany / T +49 231 975151-0 / F +49 231 975151-51 / E info@microsonic.de / W microsonic.de

The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not confirm any product features.