AbN automation

microsonic

Instrucion manual
lcs-Ultrasonic Sensors with one analogue output

lcs-25/IU/QP
lcs-35/IU/QP
lcs-130/IU/QP

Product description

- The lcs-sensor with one analogue output measures the distance to an object within the detection zone contactless. A signal proportional to distance is created according to the adjusted window margings of the analogue characteristic curve.
- The sensor automatically detects the load put to the analogue output and switches to current output or voltage output respectively.
- Choosing between rising and falling output characteristic is possible.
- Light emitting diodes (three-colour LEDs) indicate the operation conditions.
- The sensors can be trained using Teach-in processes.
- Using the LinkControl adapter (optional accessory) all sensor parameter settings may be made by a Windows-Software.

Important instructions for assembly and application

All employee and plant safety-relevant measures must be taken prior to assembly, start-up, or maintenance work (see operation manual for the entire plant and the operator instruction of the plant).

The sensors are not considered as safety equipment and may not be used to ensure human or machine safety!

The lcs-sensors indicate a **blind zone**, in which the distance cannot be measured. The **operating range** indicates the distance of the sensor that can be applied with normal reflectors with sufficient function reserve. When using good reflectors, such as a calm water surface, the sensor can also be used up to its **maximum range**. Objects that strongly absorb (e.g. plastic foam) or diffusely reflect sound (e.g. pebble stones) can also reduce the defined operating range.

Assembly instructions

- Assemble the sensor at the installation location.
- Plug in the connector cable to the M12 connector.

		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	-	black
2	I/U	white
5	Com.	grey

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

Assembly distances

The assembly distances shown in Fig.2 for two or more sensors should not be fallen below in order to avoid mutual interference.

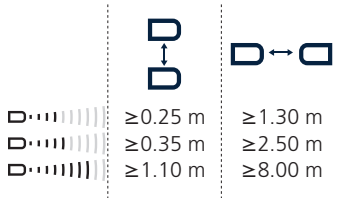


Fig. 2: Assembly distances

Start-up

lcs-sensors are delivered factory made with the following settings:

- Rising analogue characteristic
- Window margins for the analogue output set to blind zone and operating range
- Measurement range set to maximum range

Set the parameters of the sensor using the Teach-in procedure.

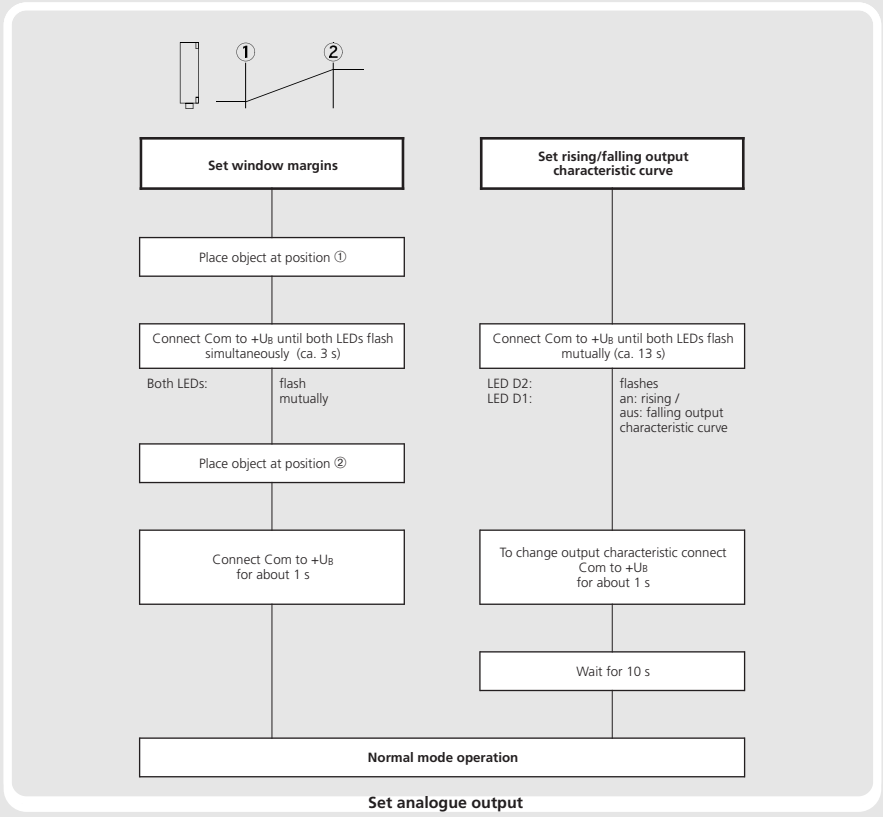
Operation

lcs-sensors work maintenance free. Small amounts of dirt on the surface do not influence function. Thick layers of dirt and caked-on dirt affect sensor function and therefore must be removed.

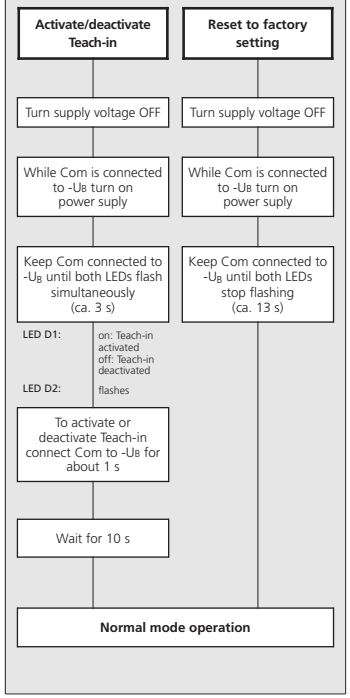
Note

- lcs-sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
- If an object is within the set window margins of the analogue output, then LED D1 lights up green, if the object is outside the window margins, then LED D1 lights up red.
- The load put to the analogue output is detected automatically when turning supply voltage on.
- If the signal at the Com line does not change for 20 seconds during parameter setting mode the made changes are stored and the sensor returns to normal mode operation.
- You can reset the factory settings at any time, see »Lock Teach-in & factory setting«.
- lcs-sensors optional can be programmed using the LinkControl adapter LCA-2, see «Optional setting of parameters using the LinkControl Adapter LCA-2».

Sensor adjustment with Teach-in procedure



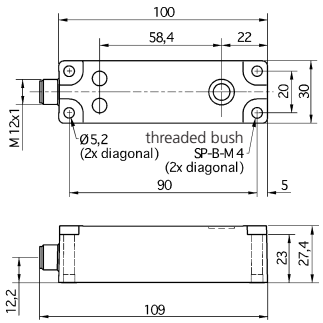
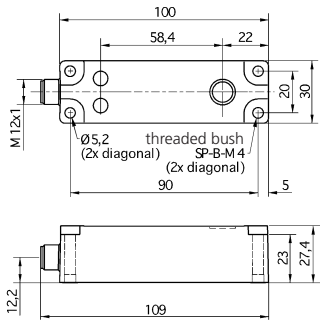
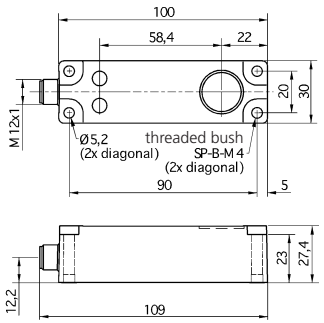
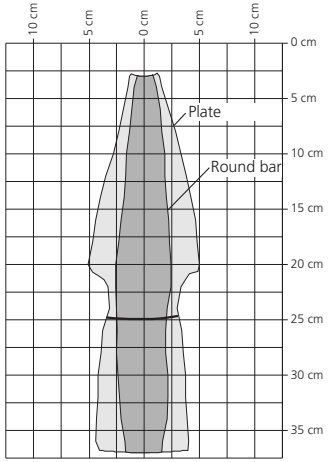
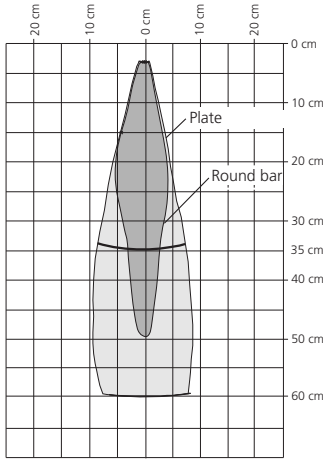
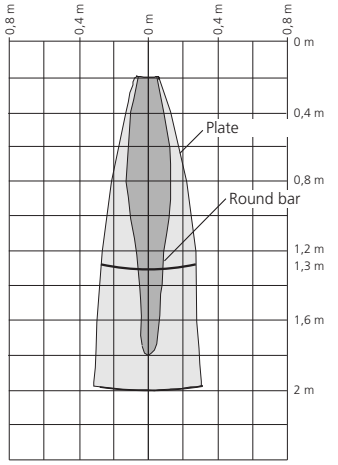
Lock Teach-in & factory setting



CE 2014/30/EU

MV-DO-074366-595316

Technical data

	lcs-25...	lcs-35...	lcs-130...
			
Blind zone	0 to 30 mm	0 to 65 mm	0 to 200 mm
Operating range	250 mm	350 mm	1.300 mm
Maximum range	350 mm	600 mm	2.000 mm
Angle of beam spread	See detection zone	See detection zone	See detection zone
Transducer frequency	320 kHz	400 kHz	200 kHz
Resolution, sampling rate	0,18 mm	0,18 mm	0,18 mm
Reproducibility	± 0,15 %	± 0,15 %	± 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	Temperature drift internal compensated, ≤ 2%, may be deactivated [1] (0,17%/K without compensation	Temperature drift internal compensated, ≤ 2%, may be deactivated [1] (0,17%/K without compensation	Temperature drift internal compensated, ≤ 2%, may be deactivated [1] (0,17%/K without compensation
Operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
Voltage ripple	±10 %	±10 %	±10 %
No-load current consumption	< 60 mA	< 60 mA	< 60 mA
Housing	PBT	PBT	PBT
	ultrasonic transducer: polyurethane foam,	ultrasonic transducer: polyurethane foam,	ultrasonic transducer: polyurethane foam,
	epoxy resin with glass content	epoxy resin with glass content	epoxy resin with glass content
Class of protection to EN 60 529	IP 65	IP 65	IP 65
Norm conformity	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Type of connection	5-pin M12 initiator plug	5-pin M12 initiator plug	5-pin M12 initiator plug
Indicators	2 three-colour LEDs	2 three-colour LEDs	2 three-colour LEDs
Programmable	Yes, with LCA-2 & LinkControl	Yes, with LCA-2 & LinkControl	Yes, with LCA-2 & LinkControl
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Storage temperature	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Weight	120 g	120 g	120 g
Response time [1]	50 ms	70 ms	110 ms
Time delay before availability	< 300 ms	< 300 ms	< 300 ms
Order No.	**lcs-25/IU/QP**	**lcs-35/IU/QP**	**lcs-130/IU/QP**
Current output 4 – 20 mA	R_L ≤ 100 Ω at 9 V ≤ U_B ≤ 20 V;	R_L ≤ 100 Ω at 9 V ≤ U_B ≤ 20 V;	R_L ≤ 100 Ω at 9 V ≤ U_B ≤ 20 V;
	R_L ≤ 500 Ω at U_B ≥ 20 V	R_L ≤ 500 Ω at U_B ≥ 20 V	R_L ≤ 500 Ω at U_B ≥ 20 V
	Rising/falling output characteristic	Rising/falling output characteristic	Rising/falling output characteristic
Voltage output 0 – 10 V	R_L ≥ 100 kΩ at U_B ≥ 15 V, short-circuit-proof	R_L ≥ 100 kΩ at U_B ≥ 15 V, short-circuit-proof	R_L ≥ 100 kΩ at U_B ≥ 15 V, short-circuit-proof
	Rising/falling output characteristic	Rising/falling output characteristic	Rising/falling output characteristic

1) Can be programmed with LinkControl

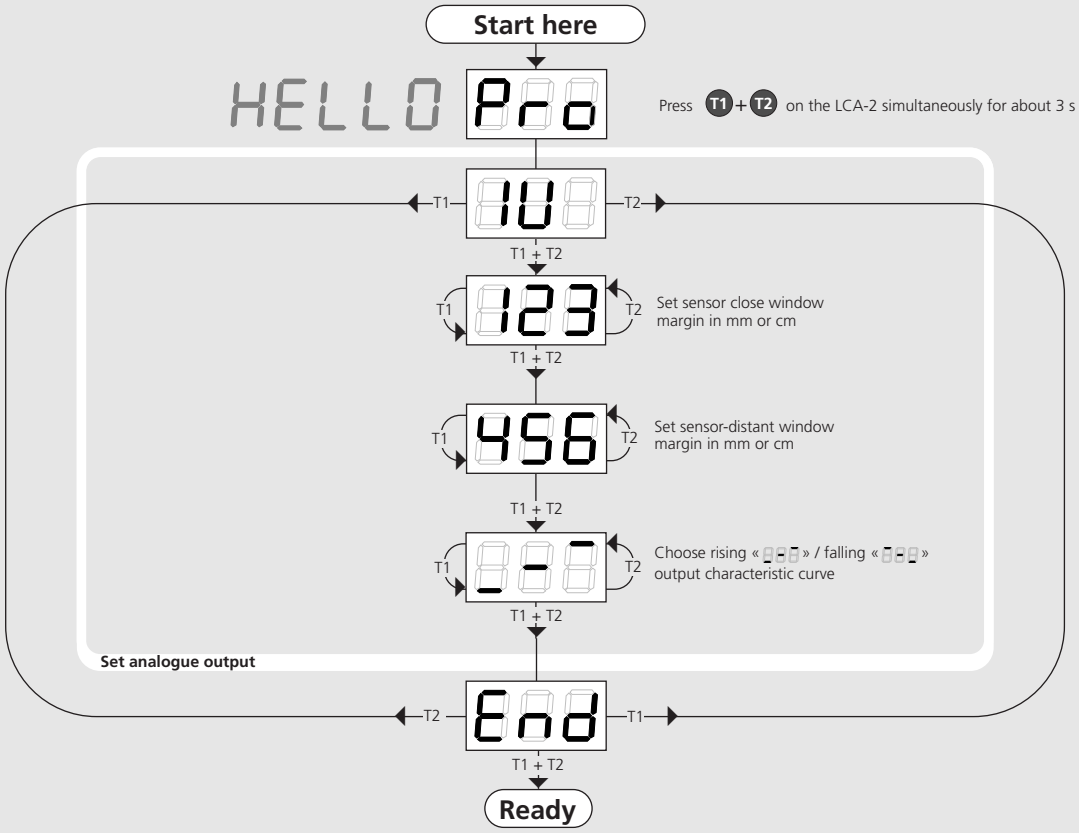
AbN
automation

Optional setting of parameters using the LinkControl Adapter LCA-2 (Offline programming)

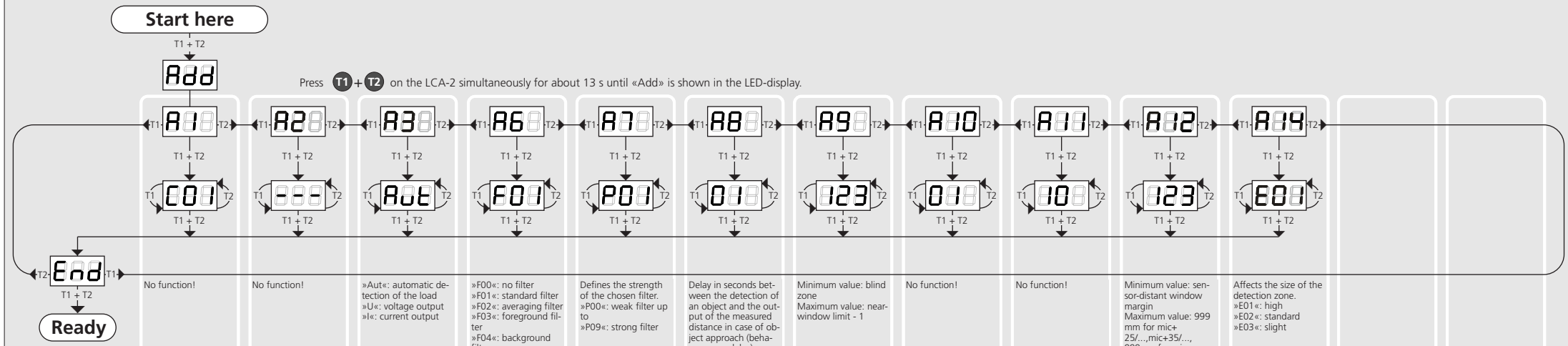
Offline programming

- Load Sensor parameters in the LinkControl Adapter LCA-2
- Change parameters and additional functions as described here
- Write changed parameters back into the lcs- sensor

Please refer to the quick reference guide on the LCA-2.



Setting of additional functions in the LCA-2



Note
Changes in the Add-on menu may impair the sensor function.
A6, A7, A8 , A10 , A11, A12 have influence on the response time of the sensor.

Low power mode	Display mode	Choose current/ voltage output	Measurement filter	Filter strength	Response time	Foreground suppression	Multiplex mode device addressing	Multiplex highest device address	Measurement range	Detection zone sensitivity
No function!	No function!	»Aut«: automatic detection of the load »U«: voltage output »I«: current output	»F00«: no filter »F01«: standard filter »F02«: averaging filter »F03«: foreground filter »F04«: background filter	Defines the strength of the chosen filter. »P00«: weak filter up to »P09«: strong filter	Delay in seconds between the detection of an object and the output of the measured distance in case of object approach (behaves as on-delay). "00": 0 s (no delay) up to "20": 20 s response time	Minimum value: blind zone Maximum value: near-window limit - 1	No function!	No function!	Minimum value: sensor-distant window margin Maximum value: 999 mm for mic+ 25/...,mic+35/..., 999 cm for mic+ 130/...,mic+340/..., mic+600/...	Affects the size of the detection zone. »E01«: high »E02«: standard »E03«: slight

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