microsonic crm Plus Series Ultrasonic Sensors Instruction Manual

microsonic

Operating Manual
crm+ Ultrasonic Sensors with one switching output an IO-Link
crm+25/F/TC/E crm+35/F/TC/E
crm+130/F/TC/E crm+340/F/TC/E
crm+600/F/TC/E

IO-Link

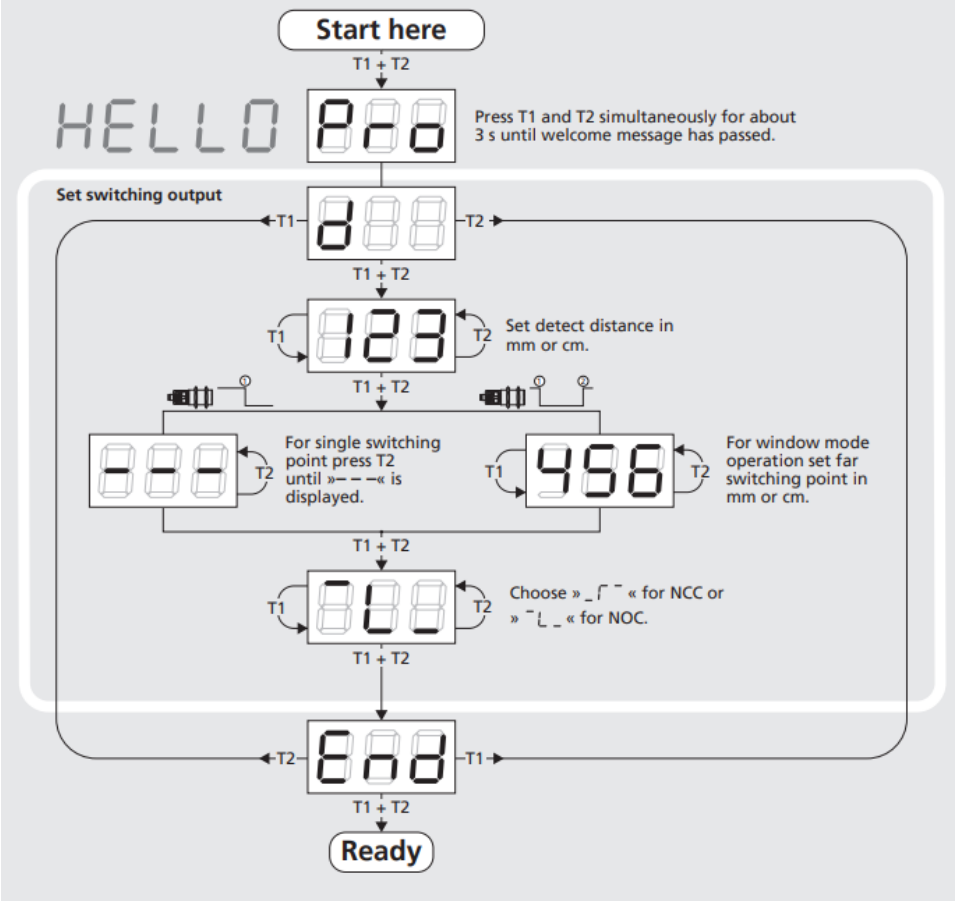
Contents

Product description

- The crm+ sensor with one switching output measures the distance to an object within the detection zone contactless. Depending on the adjusted detect distance the switching output is set.
- The ultrasonic transducer surface of the crm+ sensors is laminated with a PEEK film. The transducer itself is sealed against the housing by a PTFE joint ring. This composition ensures a high resitance against many aggressive substances.
- All settings are done with two pushbuttons and a three-digit LED-display (TouchControl).
- Three-colour LEDs indicate the switching status.
- The output functions are changeable from NOC to NCC.
- The sensors are adjustable manually via TouchControl or via Teach-in procedure.
- Useful additional functions are set in the Add-on-menu.
- Using the Link Control adapter (optional accessory) all Touch Control and additional sensor parameter settings can be adjusted by a Windows Software.

IO-Link ® The crm+ sensors are IO-Link-capable in accordance with IO-Link specification V1.1 and support Smart Sensor Profile like Digital Measuring Sensor. The crm+ sensors have a blind zonein which distance measurement is not possible. 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.

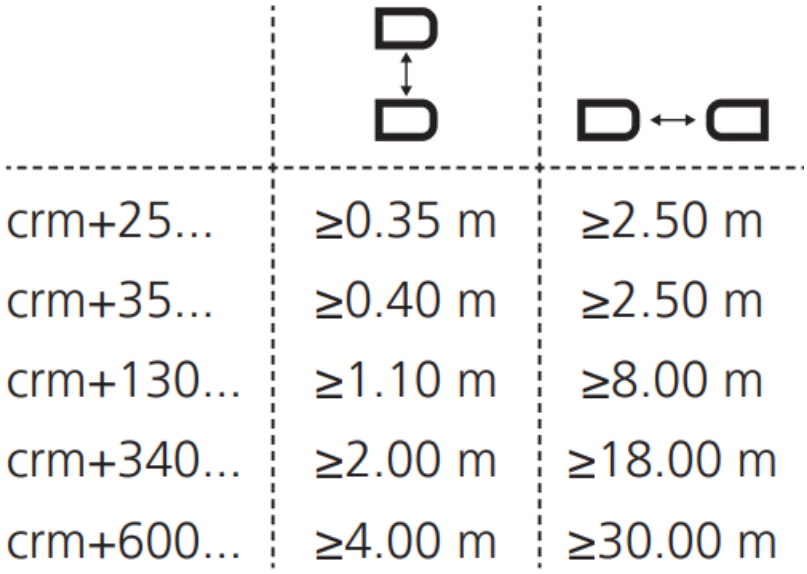
Diagram 1: Set sensor parameters numerically using LED display



Safety Notes

- Read the operating manual prior to start-up.
- Connection, installation and adjustment works may only be carried out by expert personnel.
- No safety component in accordance with the EU Machine Directive, use in the area of personal and machine protection not permitted

Proper Use
crm+ ultrasonic sensors are used for non-contact detection of objects.
Synchronisation
If the assembly distance of multiple sensors falls below the values shown in Fig. 1 the integrated synchronisation should be used. Connect Sync/ Com-channels (pin 5 at the units receptable) of all sensors (10 maximum).



	D ↕ D	D ↔ D
crm+25...	≥0.35 m	≥2.50 m
crm+35...	≥0.40 m	≥2.50 m
crm+130...	≥1.10 m	≥8.00 m
crm+340...	≥2.00 m	≥18.00 m
crm+600...	≥4.00 m	≥30.00 m

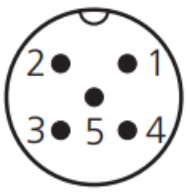
Fig. 1: Assembly distances, indicating synchronisation/multiplex

Multiplex mode

The Add-on-menu allows to assign an individual address »01« to »10« to each sensor connected via the Sync/Com-channel (Pin5). The sensors perform the ultrasonic measurement sequentially from low to high address. Therefore any influence between the sensors is rejected. The address »00« is reserved to syn- chronisation mode and deactivates the multiplex mode. To use synchronised mode all sensors must be set to address »00«.

Installation

➨ Mount the sensor at the place of fitting.
➨ Connect a connection cable to the M12 device plug, see Fig. 2.



		colour
1	$+U_B$	brown
3	$-U_B$	blue
4	F	black
2	–	white
5	Sync/Com	grey

Fig. 2: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

Start-up

➨ Connect the power supply.
➨ Set the parameters of the sensor manually via TouchControl (see Fig. 3 and Diagram 1)
➨ or use the Teach-in procedure to adjust the detect points (see Diagram 2).

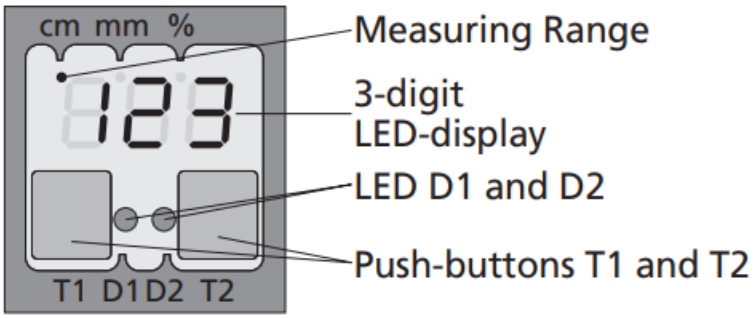


Fig. 3: TouchControl/LED display

Factory setting
crm+ sensors are delivered factory made with the following settings:

- Switching output on NOC
- Detecting distance at operating range
- Measurement range set to maximum range

Maintenance
crm+ 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.

Notes

- As a result of the design the assembly of PEEK film and PTFE joint ring is not gas-proof.
- The chemical resistance has to be tested experimentally if necessary.
- crm+ 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.
- In the normal operating mode, a yellow LED D2 signals that the switching output is switched through.
- In the normal operating mode, the measured distance value is displayed on the LED-indicator in mm (up to 999 mm) or cm (from 100 cm). Scale switches automatically and is indicated by a point on top of the digits.
- In the Teach-in mode, the hysteresis loops are set back to factory settings.
- If no objects are placed within the detection zone the LED-indicator shows »– – –«.
- If no push-buttons are pressed for 20 seconds during parameter setting mode the made changes are discarded and the sensor returns to normal operating mode.
- The sensor can be reset to its factory setting, see »Key lock and factory setting«, Diagram 3.
- The latest IODD file and informations about start-up and configuration of crm+ sensors with IO-Link, you will find online at **www.microsonic.de/en/crm+**.

Show parameters
➔ In normal operating mode shortly push T1. The LED display shows »PAr.« Each time you tap push-button T1 the actual settings of the analogue output are shown.

Diagram 2: Set sensor parameters via Teach-in procedure

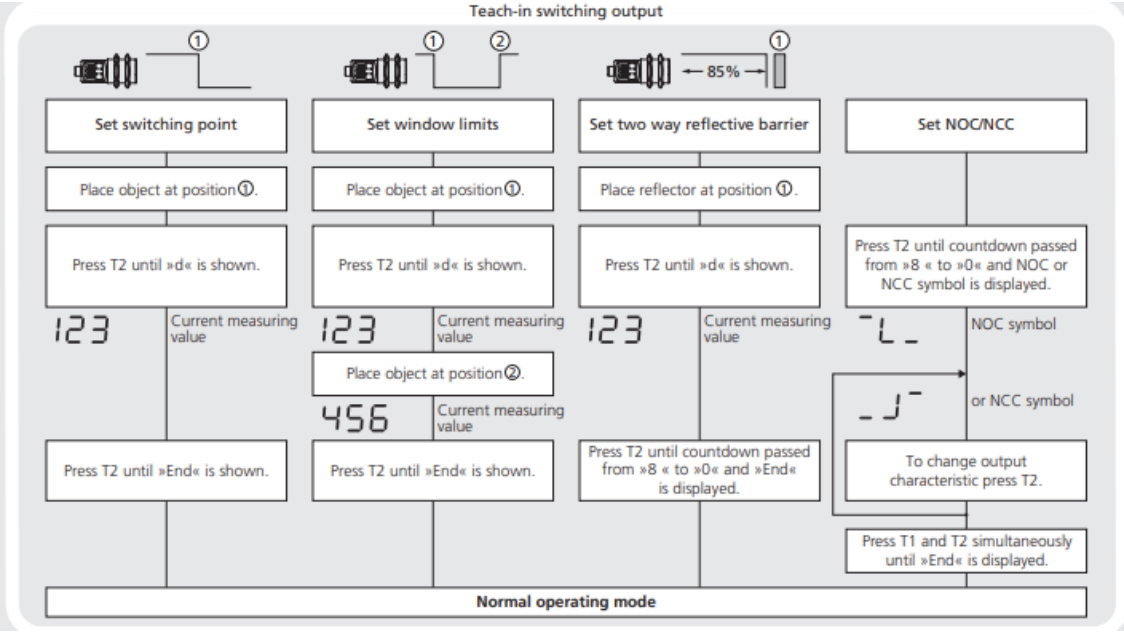


Diagram 3: Key lock and factory setting

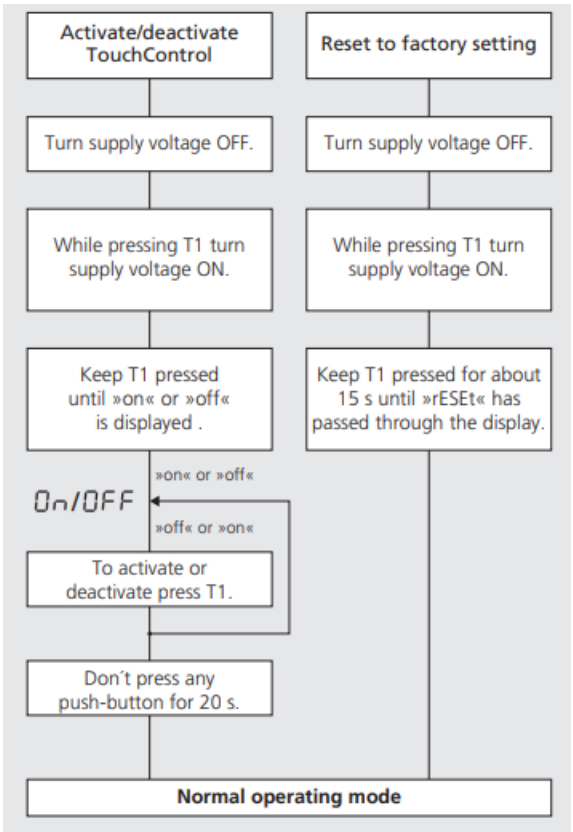
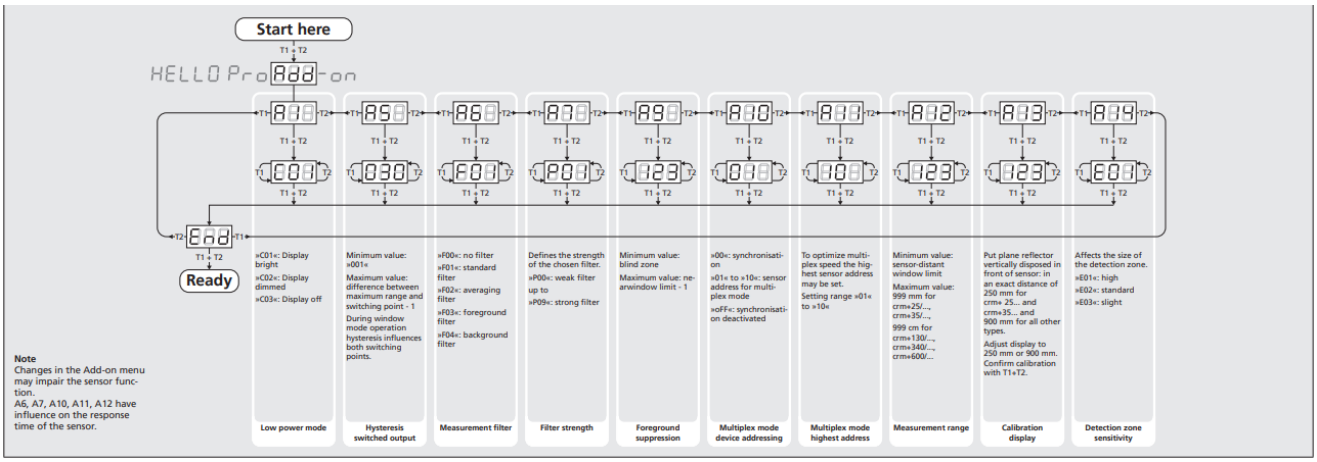
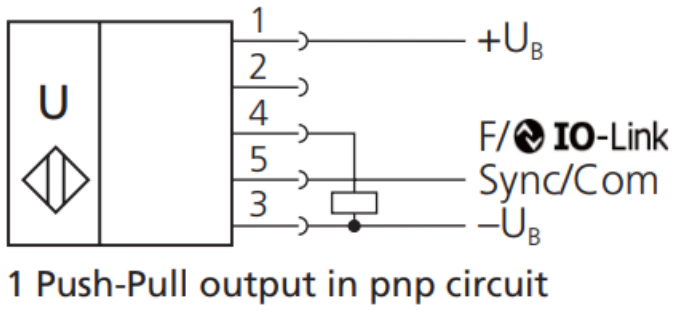


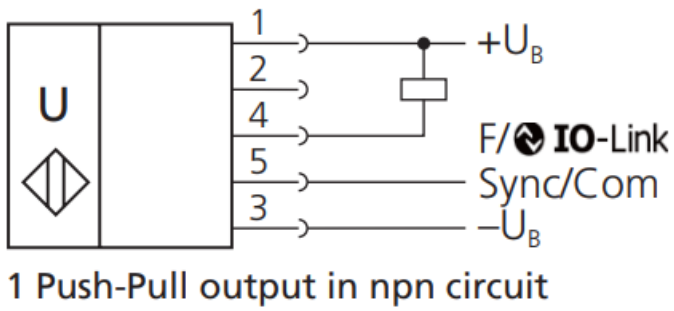
Diagram 4: Useful additional functions in Add-on menu (for experienced users only, settings not required for standard applications)



Technical data

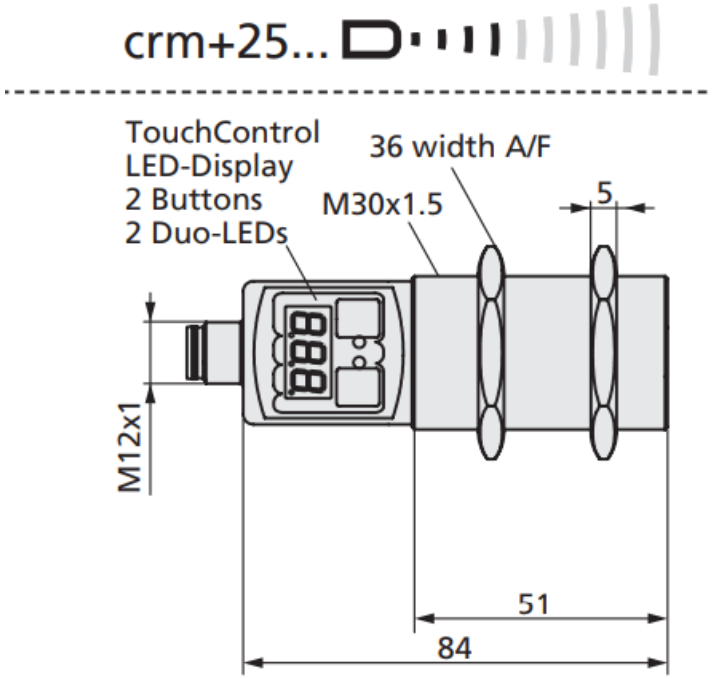


1 Push-Pull output in pnp circuit

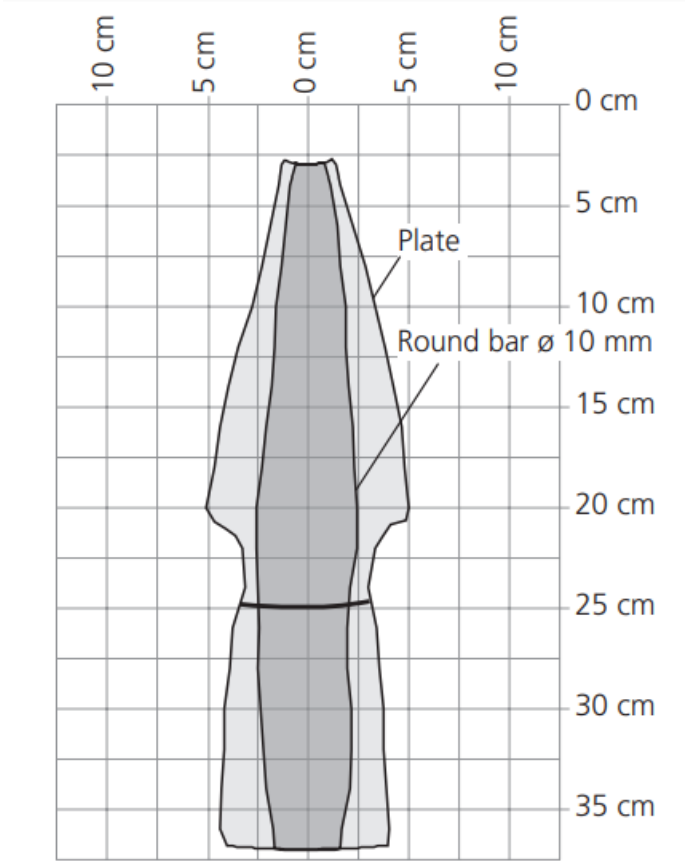


1 Push-Pull output in npn circuit

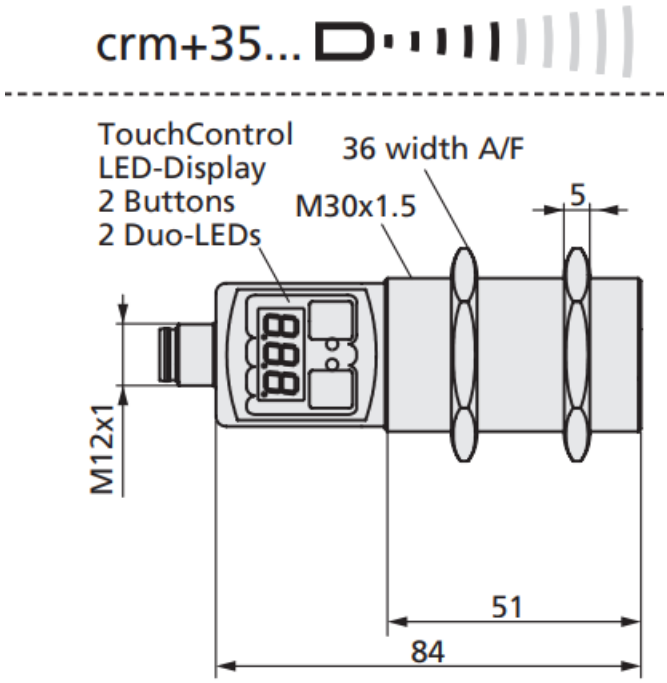
blind zone operating range maximum range angle of beam spread transducer frequency resolution detection zones for different objects:
The dark grey areas represent the zone where it is easy to recognise the normal reflector (round bar).
This indicates the typical operating range of the sensors. The light 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. reproducibility accuracy operating voltage U voltage ripple no-load supply current housing class of protection to EN 60529 norm conformity type of connection controls indicators programmable operating temperature storage temperature weight switching hysteresis switching frequency 1) response time 2) time delay before availability 2) order No. switching output



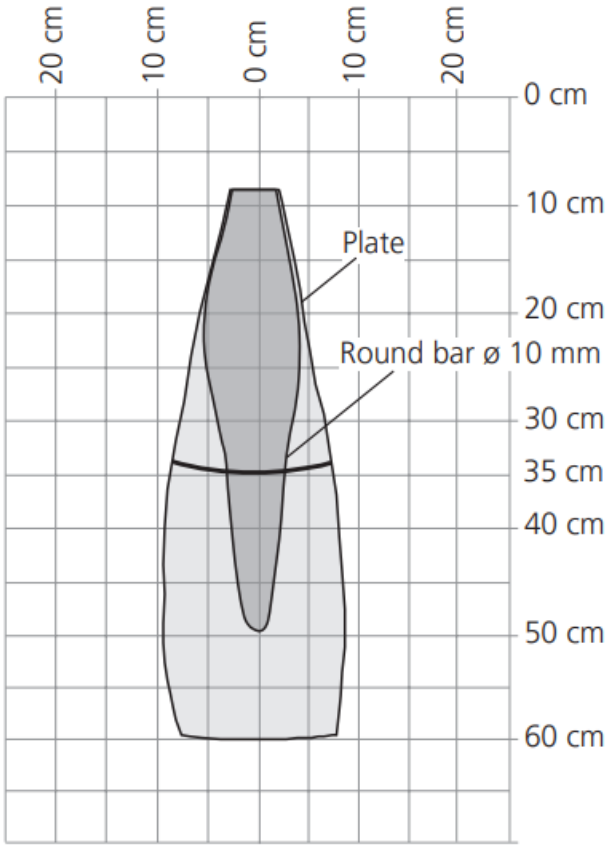
0 to 30 mm 250 mm 350 mm see detection zone 320 kHz 0.025 mm



±0.15 % ±1 % (Temperature drift internal compensated, may be deactivated 3) , 0.17%/K without compensation) 9 to 30 V DC, short-circuit-proof, Class 2 ±10 % ≤ 80 mA Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE IP 67 EN 60947-5-2 5-pin initiator plug, PBT 2 push-buttons (TouchControl) 3-digit LED display, 2 three-colour LEDs TouchControl, LinkControl, IO-Link –25 to +70 °C –40 to +85 °C 150 g 3 mm 25 Hz 32 ms <300 ms crm+25/F/TC/E Push-Pull, U B – 3 V, –U B + 3 V, I max = 100 mA switchable NOC/NCC, short-circuit-proof



0 to 85 mm 350 mm 600 mm see detection zone 360 kHz 0.025 mm



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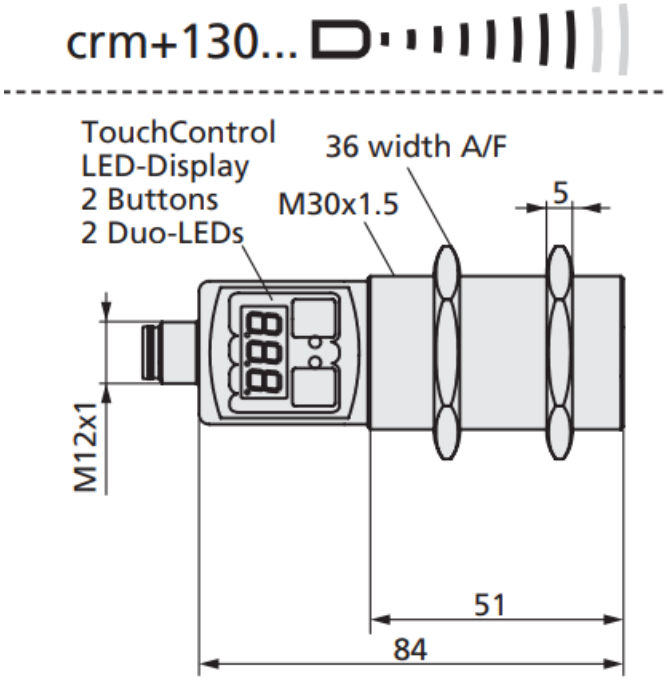
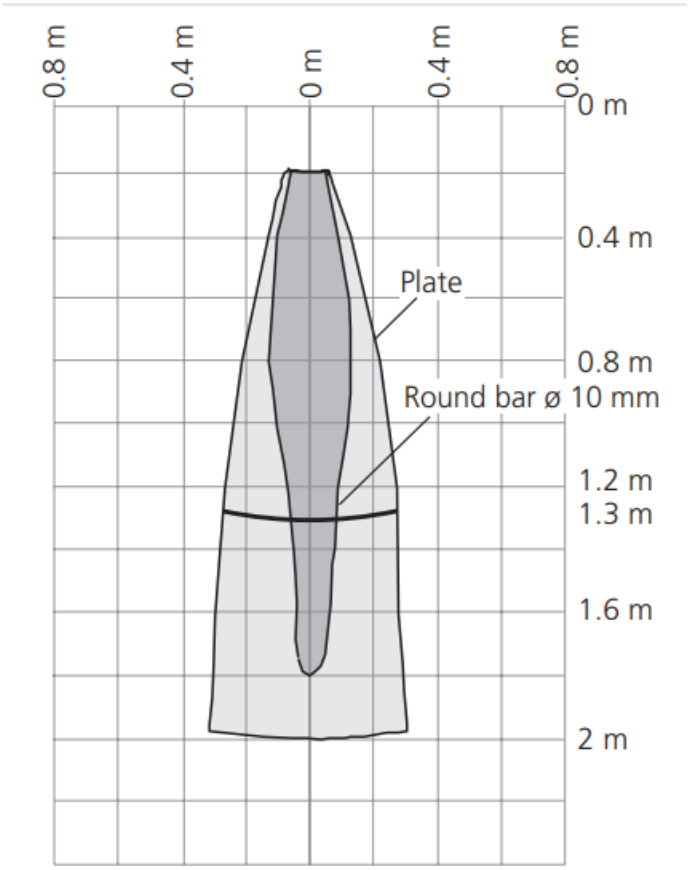


0 to 200 mm 1,300 mm 2,000 mm see detection zone 200 kHz 0.18 mm



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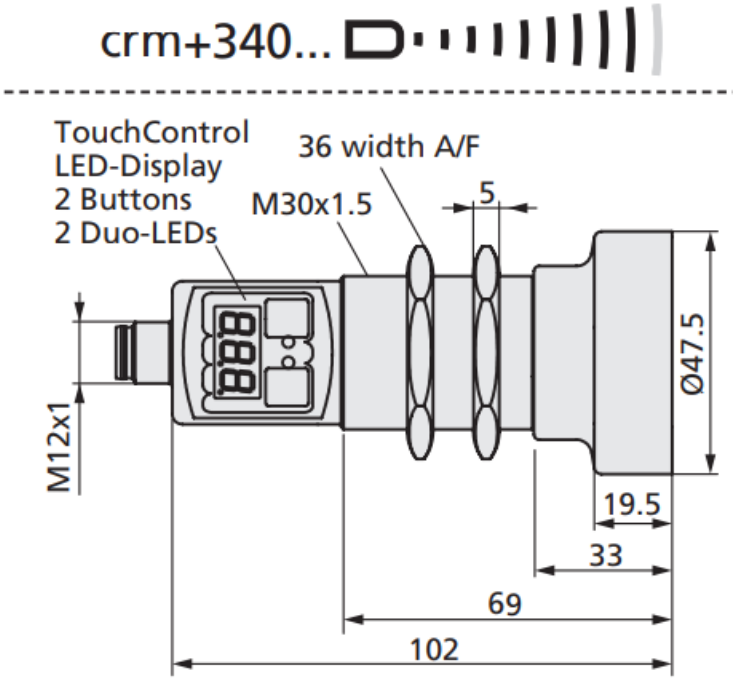
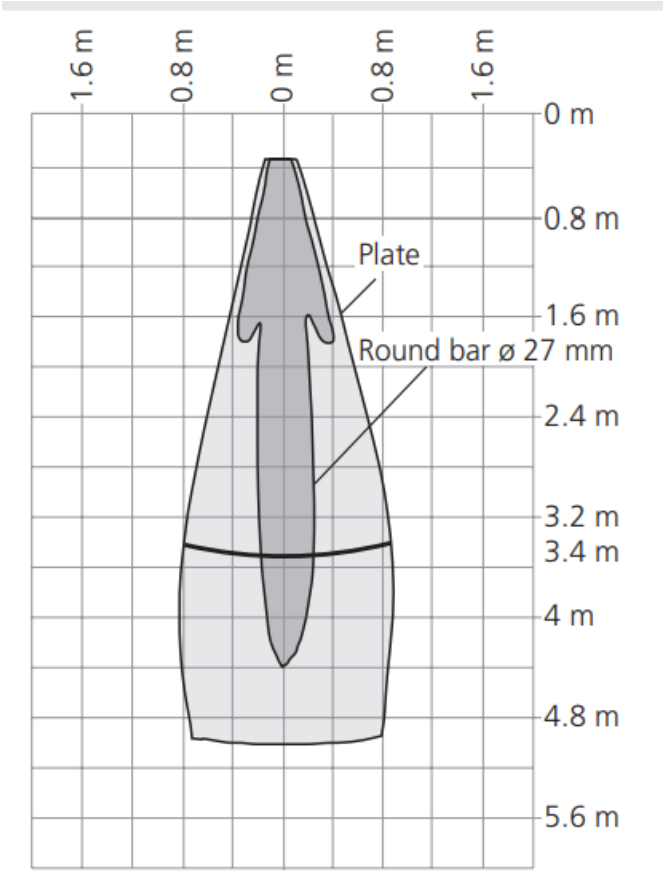
92 ms <300 ms crm+130/F/TC/E Push-Pull, U B – 3 V, –U B + 3 V, I max = 100 mA switchable NOC/NCC, short-circuit-proof



0 to 350 mm 3,400 mm 5,000 mm see detection zone 120 kHz 0.18 mm



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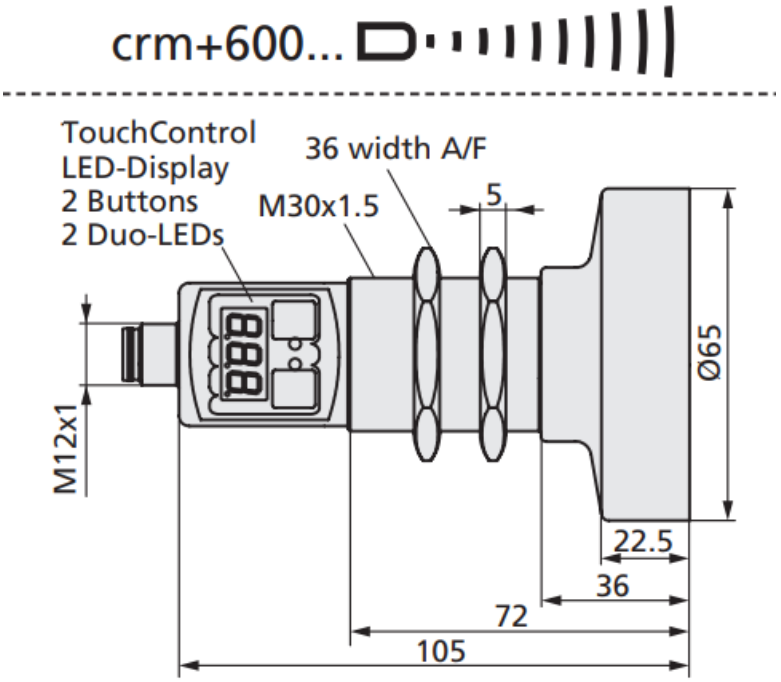
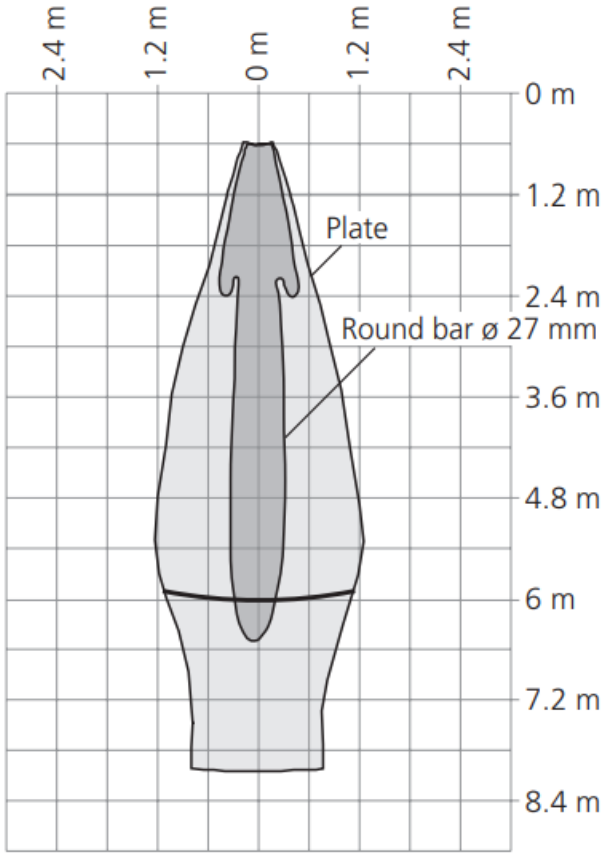


0 to 600 mm 6,000 mm 8,000 mm see detection zone 80 kHz 0.18 mm



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1. Can be programmed via Touch Control, LinkControl and IO-Link.
2. With Touch Control, Link Control and IO-Link, the selected filter setting and the maximum range influence the

switching frequency and the response time.

3. Can be deactivated via Link Control.

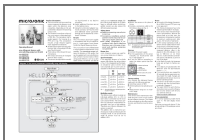
microsonic GmbH / Phoenixseestraße 7 / 44263 Dortmund / Germany /
T +49 231 975151-0
F +49 231 975151-51
E info@microsonic.de
W microsonic.de
The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not warrant any product features.

Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.
The proximity switches shall be used with a Listed (CYJV/7) cable/connector assembly rated minimum 32 Vdc, minimum 290 mA, in the final installation.

2014/30/EU

MV-DO-200442-859549

Documents / Resources

	microsonic crm Plus Series Ultrasonic Sensors [pdf] Instruction Manual crm 25-F-TC-E, crm 35-F-TC-E, crm 130-F-TC-E, crm 340-F-TC-E, crm 600-F-TC-E, crm Plus Series Ultrasonic Sensors, crm Plus Series, Ultrasonic Sensors, Sensors

References

- User Manual