

## microsonic crm+ Ultrasonic Sensors with Two Switching Outputs Instruction Manual

[Home](#) » [microsonic](#) » microsonic crm+ Ultrasonic Sensors with Two Switching Outputs Instruction Manual 

# microsonic

Operating Manual  
crm+ Ultrasonic Sensors with two switching outputs



crm+25/DD/TC/E  
crm+35/DD/TC/E  
crm+130/DD/TC/E  
crm+340/DD/TC/E  
crm+600/DD/TC/E

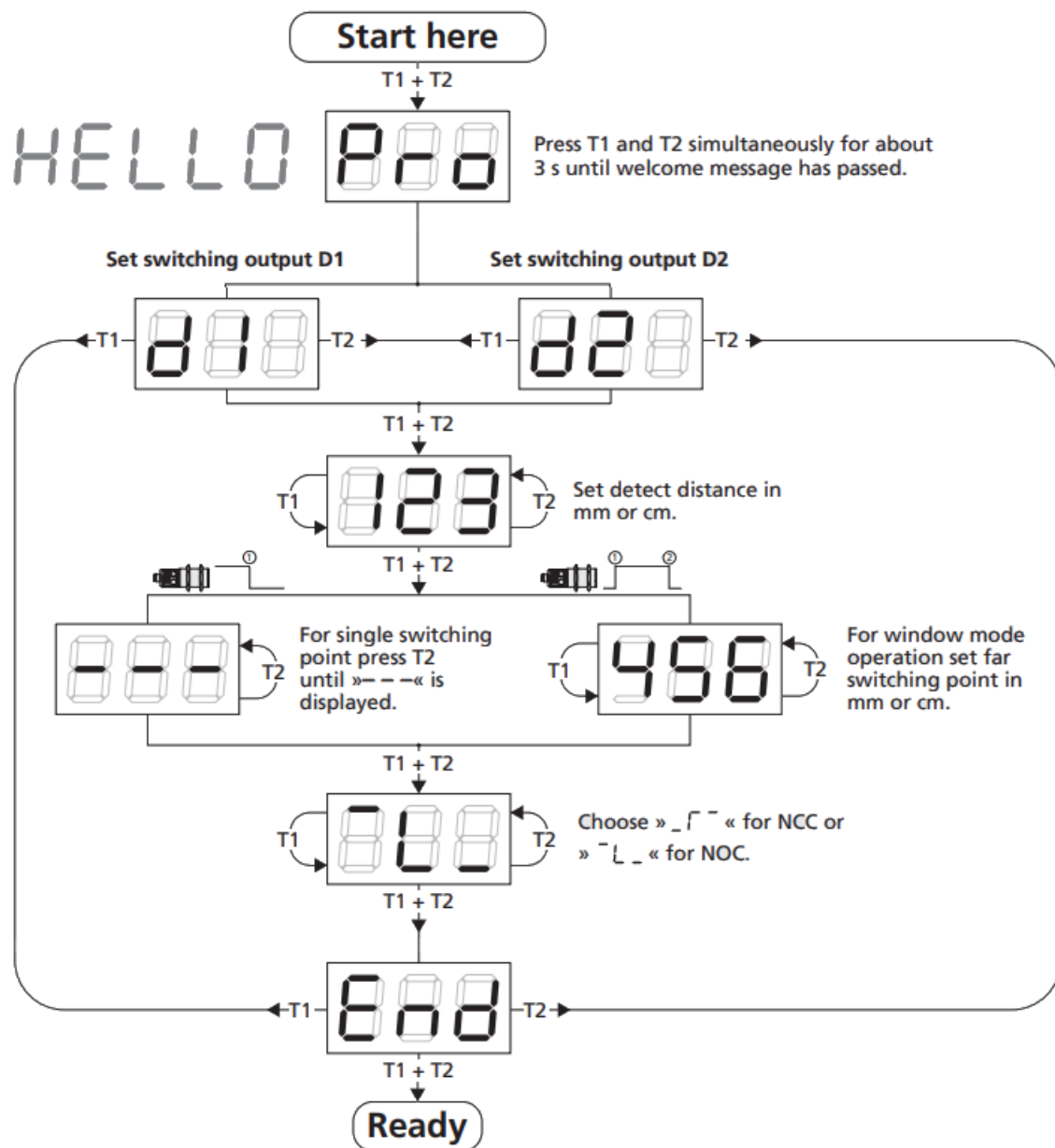
## Contents

- [1 Product description](#)
- [2 Safety Notes](#)
- [3 Installation](#)
- [4 Maintenance](#)
- [5 Technical data](#)
- [6 Documents / Resources](#)
- [7 Related Posts](#)

## Product description

- The crm+ sensor with two switching outputs 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 resistance 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 LinkControl adapter (optional accessory) all TouchControl and additional sensor parameter settings can be adjusted by a Windows® Software.

The crm+ sensors have a blind zone in 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.



## Safety Notes

- Read the operating instructions 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 distances shown in Fig. 1 for two or more sensors are exceeded the integrated synchronisation should be used. Connect Sync/Comchannels (pin 5 at the units receptable) of all sensors (10 maximum).



		
crm+25...	$\geq 0.35$ m	$\geq 2.50$ m
crm+35...	$\geq 0.40$ m	$\geq 2.50$ m
crm+130...	$\geq 1.10$ m	$\geq 8.00$ m
crm+340...	$\geq 2.00$ m	$\geq 18.00$ m
crm+600...	$\geq 4.00$ m	$\geq 30.00$ 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 synchronisation mode and eactivates the multiplex mode. To use synchronised mode all sensors must be set to address »00«.

### Installation

- ➔ Assemble the sensor at the installation location.
- ➔ Plug in the connector cable to the M12 connector, see Fig. 2.

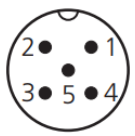

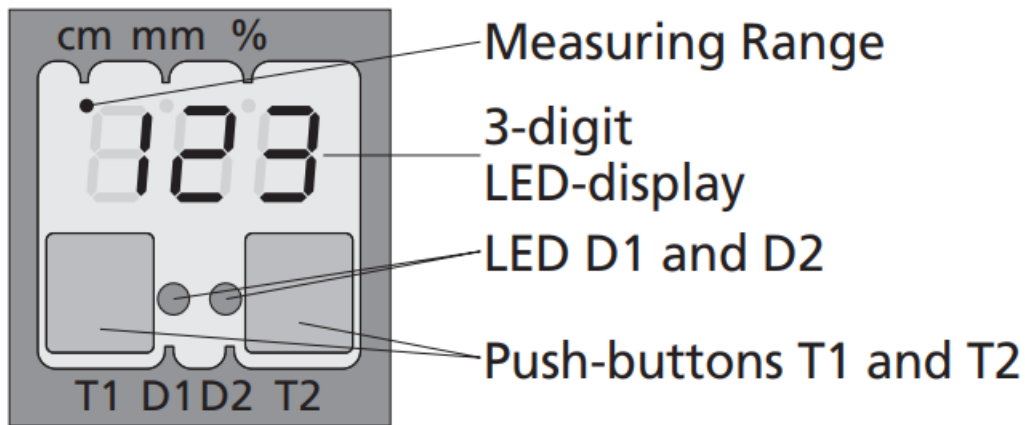
		colour
1	+UB	brown
3	-UB	blue
4	D2	black
2	D1	white
5	Sync/Com	grey

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 outputs on NOC
- Detecting distance at operating range and half 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.
- During normal operating mode, a yellow LED D2 signals that the switching output has connected.
- During 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.
- During 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 stored 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.

### 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

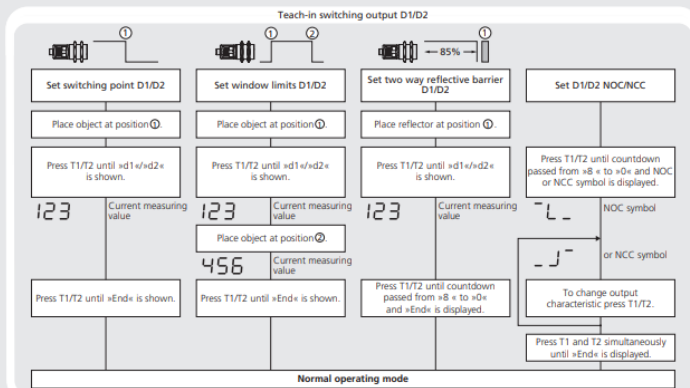


Diagram 3: Key lock and factory setting

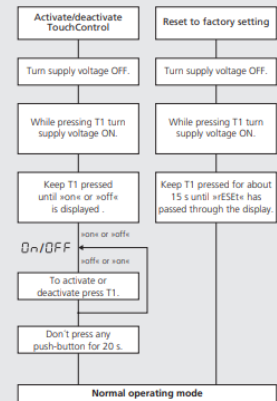
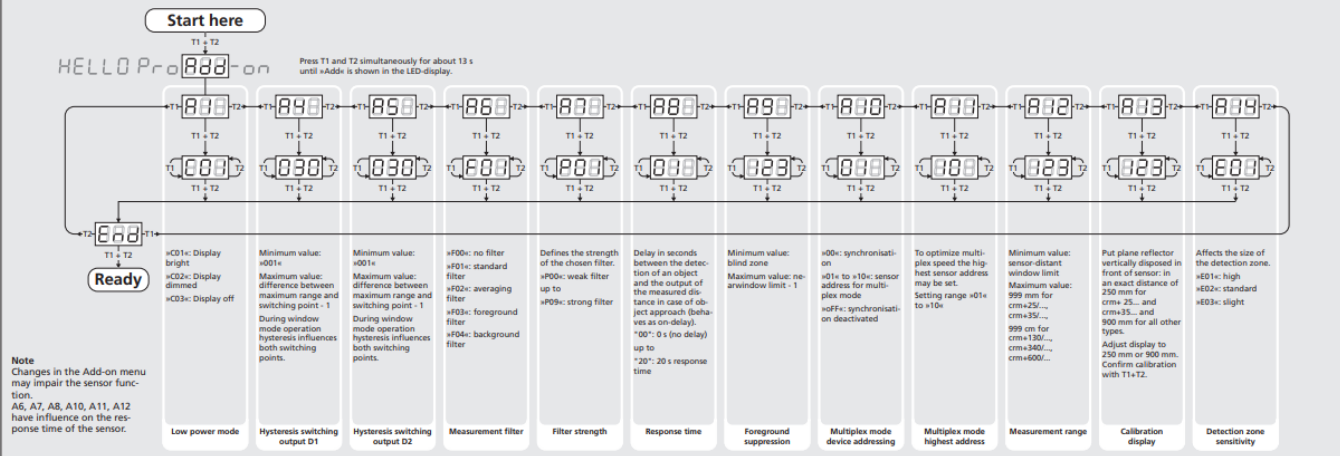
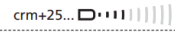
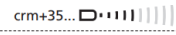
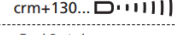


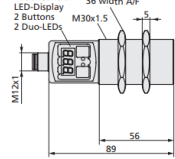
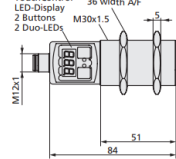
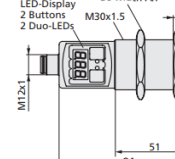
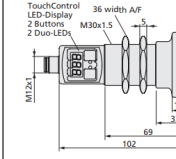
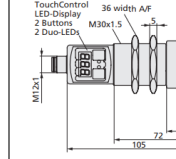


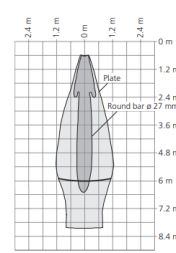
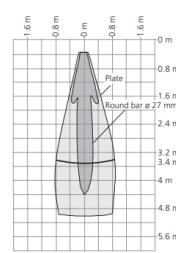
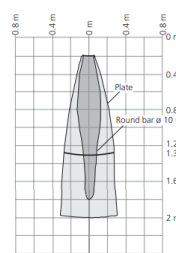
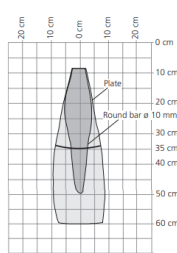
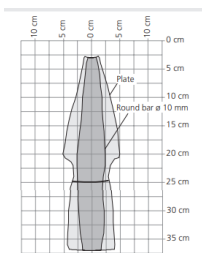
Diagram 4: Useful additional functions in Add-on menu (for experienced users only, settings not required for standard applications)



## Technical data

	crm+25... 	crm+35... 	crm+130... 	crm+340... 	crm+600... 
					
blind zone	0 to 30 mm	0 bis 85 mm	0 to 200 mm	0 to 350 mm	0 to 600 mm
operating range	250 mm	350 mm	1,300 mm	3,400 mm	6,000 mm
maximum range	350 mm	600 mm	2,000 mm	5,000 mm	8,000 mm
angle of beam spread	see detection zone	see detection zone	see detection zone	see detection zone	see detection zone
transducer frequency	320 kHz	360 kHz	200 kHz	120 kHz	80 kHz
resolution	0.025 mm	0.025 mm	0.18 mm	0.18 mm	0.18 mm

detection zone  
s  
for different ob  
jects:  
The dark grey  
areas  
represent the  
zone where it i  
s easy to reco  
gnise the norm  
al reflector (ro  
und bar). This i  
ndicates the ty  
pical operating  
range of the  
sensors. The li  
ght grey areas  
represent the z  
one  
where a very l  
arge reflector  
– for instance  
a plate – can s  
till be recognis  
ed.  
The requireme  
nt  
here is for an o  
ptimum alignm  
ent to the sens  
or. It is  
not possible to  
evaluate ultras  
onic  
reflections out  
side  
this area.



reproducibility	±0.15 %	±0.15 %	±0.15 %	±0.15 %	±0.15 %
accuracy	±1 % (Temperature drift internal compensated, may be deactivated 3), 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated 3), 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated 3), 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated 3), 0.17%/K without compensation)	±1 % (Temperature drift internal compensated, may be deactivated 3), 0.17%/K without compensation)
operating voltage UB	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2	9 to 30 V DC, short-circuit-proof, Class 2
voltage ripple	±10 %	±10 %	±10 %	±10 %	±10 %

no-load supply current	≤ 80 mA	≤ 80 mA	≤ 80 mA	≤ 80 mA	≤ 80 mA
housing	Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE epoxy resin with glass content	Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE epoxy resin with glass content	Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE epoxy resin with glass content	Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE epoxy resin with glass content	Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE epoxy resin with glass content
class of protection to EN 60529	IP 67	IP 67	IP 67	IP 67	IP 67
norm conformity	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
type of connection	5-pin initiator plug, PBT	5-pin initiator plug, PBT	5-pin initiator plug, PBT	5-pin initiator plug, PBT	5-pin initiator plug, PBT
controls	2 push-buttons (TouchControl)	2 push-buttons (TouchControl)	2 push-buttons (TouchControl)	2 push-buttons (TouchControl)	2 push-buttons (TouchControl)
indicators	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs
programmable	with TouchControl and LinkControl	with TouchControl and LinkControl	with TouchControl and LinkControl	with TouchControl and LinkControl	with TouchControl and LinkControl
operating temperature	−25 to +70 °C	−25 to +70 °C	−25 to +70 °C	−25 to +70 °C	−25 to +70 °C
storage temperature	−40 to +85 °C	−40 to +85 °C	−40 to +85 °C	−40 to +85 °C	−40 to +85 °C
weight	150 g	150 g	150 g	210 g	270 g
switching hysteresis 1)	3 mm	5 mm	20 mm	50 mm	100 mm
switching frequency 2)	25 Hz	12 Hz	8 Hz	4 Hz	3 Hz
response time 2)	32 ms	64 ms	92 ms	172 ms	240 ms
time delay before availability	<300 ms	<300 ms	<300 ms	<380 ms	<450 ms



order No.	crm+25/DD/TC/ E	crm+35/DD/TC/ E	crm+130/DD/TC/ E	crm+340/DD/TC/ /E	crm+600/DD/TC/ E
switching output	2 x pnp, UB – 2 V, I <sub>max</sub> = 2 x 200 mA switchable NOC/ NCC, short-circuit-proof	2 x pnp, UB – 2 V, I <sub>max</sub> = 2 x 200 mA switchable NOC/ /NCC, short-circuit-proof	2 x pnp, UB – 2 V, I <sub>max</sub> = 2 x 200 mA switchable NOC/ NCC, short-circuit-proof	2 x pnp, UB – 2 V, I <sub>max</sub> = 2 x 200 mA switchable NOC/ /NCC, short-circuit-proof	2 x pnp, UB – 2 V, I <sub>max</sub> = 2 x 200 mA switchable NOC/ NCC, short-circuit-proof

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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.



## Documents / Resources

	<a href="#">microsonic crm+ Ultrasonic Sensors with Two Switching Outputs</a> [pdf] Instruction Manual crm 25-DD-TC-E, crm 35-DD-TC-E, crm 130-DD-TC-E, crm 340-DD-TC-E, crm 600-DD-TC-E, crm Ultrasonic Sensors with Two Switching Outputs, Ultrasonic Sensors with Two Switching Outputs, Sensors with Two Switching Outputs, Two Switching Outputs
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