microsonic



Extract from our online catalogue:

mic+340/D/TC

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mic+ sensors are available in four device designs with five different detection ranges

HIGHLIGHTS

- Digital display with direct measured value output in mm/cm or %
- IO-Link interface › for support of the new industry standard
- Numeric configuration of the sensor using digital display › permits complete advance configuration of the sensor
- Automatic synchronisation and multiplex operation › for simultaneous operation of up to ten Sensors in close quarters
- UL Listed to Canadian and US safety standards

BASICS

- 1 Push-Pull switching output › pnp or npn basis
- 1or 2 switching outputs › in pnp or npn variants
- Analogue output 4–20 mA and 0–10 V › with automatic switching between current and voltage outputs
- Analogue output plus 1 pnp switching output
- 5 detection ranges with a measurement range of 30 mm to 8 m
- microsonic Teach-in by using button T1 and T2
- 0.025 mm to 2.4 mm resolution
- Temperature compensation
- 9–30 V operating voltage
- LinkControl › for configuration of sensors from a PC

Description

The mic+ sensor family

embedded in its M30 housing design covers a measuring range from 30 mm to 8 m with its five detection ranges. Depending on the detection range, the internal resolution for distance measurement is 0.025 or 2.4 mm. All sensors are equipped with integrated temperature compensation.



TouchControl with LED Display

Four different output levels

are available for all five detection ranges:



1 switching output, optionally in pnp, npn or Push-Pull circuitry



2 switching outputs, optionally in pnp or npn circuitry



1 analogue output 4–20 mA and 0–10 V



1 analogue output with an additional pnp switching output

With TouchControl

all sensor settings are made. The easily readable LED display constantly shows the current distance value and automatically alternates between the millimetre and centimetre indication. By operating the two keys beneath the LED display, the parameterisation is called up and the self-explanatory menu structure is run through.
The detection points of the switching outputs and the window limits for the analogue output can be pre-set numerically

via the LED display without the object to be detected being positioned within the detection range. Therefore, it is possible to completely set the sensor without the help of auxiliary reflectors, even outside the actual application.

Two three-colour LEDs

always indicate the current status of the switching outputs and/or the analogue output.

Further additional function (add-ons)

are available as an option within the TouchControl menu structure. Measured distances can be smoothed with different measurement filters, e.g., be stressed by means of the ten level software filter, from F00 (direct measuring value output without filtration) to F09 (extremely strong filtration and measuring value attenuation). A high measuring-value attenuation is useful for filling-level measuring operations with wave motions or in situations where parts may sporadically fly between the sensor and the actual measuring surface. The default filter value is F01. Thus, the sensors are preset for rapid counting and control operations. As further add-ons, the default settings of the switching hysteresis of the switching outputs can be changed if required. The LED display can be permanently switched off or dimmed.

Analogue sensors

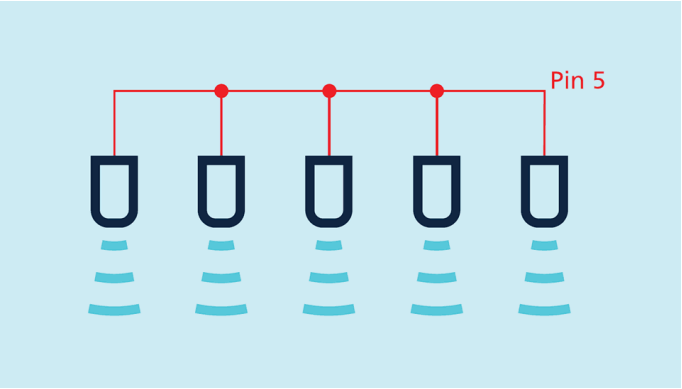
verify the load connected to the output and automatically switch to 4–20 mA current output and 0–10 V voltage output depending on the resistance value. The load verification by the sensor is always initiated upon connection of the operating voltage.

In the add-on menu of TouchControl, the user can, however, also preset the sensor to current or voltage output. In this menu, the measuring value output on the LED display with analogue sensors can additionally be changed to indicate percentage. The window limits of the analogue characteristic curve then correspond to the 0% or the 100% value respectively.

Synchronisation

of up to ten sensors automatically also operates in a mixed configuration of sensors with different detection ranges. The measurement repetition rate is then determined by the sensor with the largest detection range. If the sensors are electrically connected via pin 5 of the M12 circular connector, the synchronisation is active. In synchronised operation, all sensors initiate the measuring process at exactly the same time. With relatively narrow mounting distances between the sensors, a sensor may also receive echo signals from an adjacent sensor.

This can be used as an advantage, e.g. to broaden a sensor’s detection range.



Synchronisation using pin 5

If more than ten sensors need to be synchronised, this can be carried out with the SyncBox1 , which is available as an accessory.

Multiplex operation

ensures that each sensor can only receive echo signals from its own transmission pulse, which completely avoids any interference between the sensors (crosstalk).

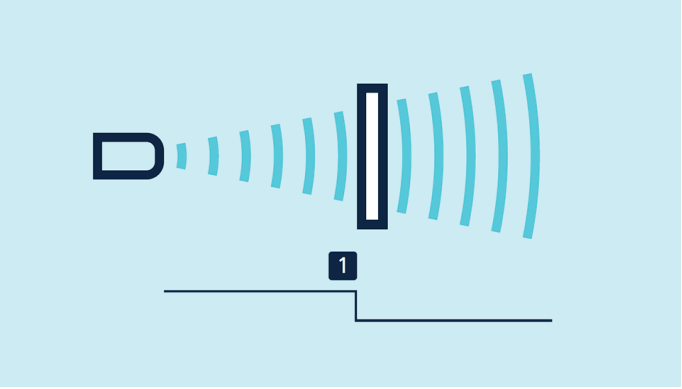
Each sensor is assigned an address from 1 to 10 for this purpose in the add-on menu. The sensors then work in multiplex mode and carry out their measurements one after the other in ascending address order.

The setting of a switching or an analogue output

is either carried out by means of numerically entering the desired distance values or by means of a Teach-in procedure. Thanks to this, the user can select the preferred setting mode.

In the microsonic Teach-in process

the object to be detected must be placed in the desired distance (1) to the sensor. The button assigned to the output must then be pressed until tEACH d1 (or tEACH d2) appears on the LED display. Finally, the Teach-in procedure must be confirmed by a further short keystroke. Ready.

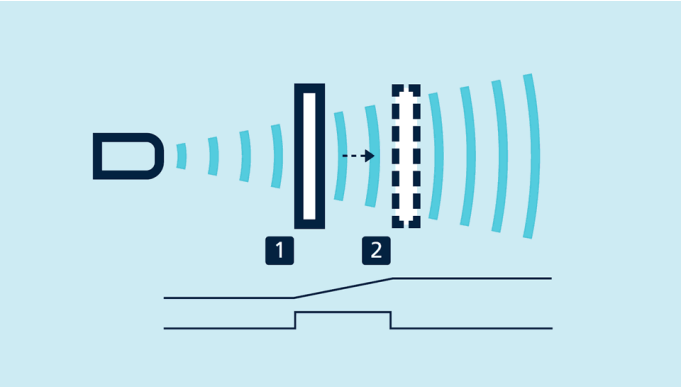


Teach-in of a switching point

To set an analogue output

the object to be detected must first be placed on the sensor-close window limit (1) and the key assigned to the output must be pressed until TEACH IU appears on the display. Then, the object to be detected must be moved to the sensor-distant window limit (2) and the Teach-in procedure must be terminated by a further short keystroke. Ready.

To set window mode with two switching points, the same procedure applies to one switching output.



Teach-in of an analogue characteristic curve or a window with two switching points

NCC/NOC

for the switching outputs and rising/falling characteristic for the analogue sensors can also be set by means of the Teach-in-procedure. For this, press the key assigned to output until the symbol ¯⌊_ bzw. _-¯ appears on the display. With each further keystroke, the NCC/NOC (_⌋¯ / ¯⌊_) and rising/falling (_-¯ / ¯-_) settings are alternated. After approx. 10 seconds, the new setting is automatically stored.

LinkControl

consists of the LinkControl adapter and the LinkControl software and facilitates the configuration of the mic+ sensors via a PC or laptop with all conventional Windows® operating systems. All settings of the TouchControl menu can be read ou during operation, edited on the PC, buffered and re-entered into the sensor.
Especially the two measuring value plotters for the visualisation of distance values support the development of solutions for complex automation tasks.



Sensor connected to the PC via LCA-2 for programming

IO-Link integrated

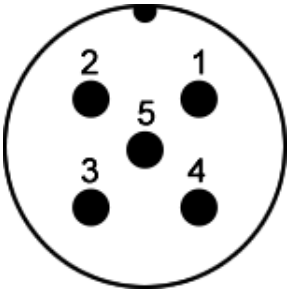
in version 1.1 for sensors with switching output.

Pin assignment



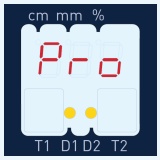
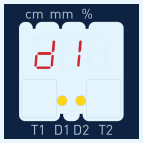
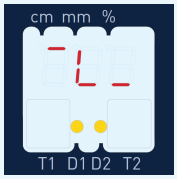
Pin	PNP	NPN	PNP	NPN	Analogue output	1 PNP output + Analogue	Colour code of sensor cable
1	$+U_B$	$+U_B$	$+U_B$	$+U_B$	$+U_B$	$+U_B$	brown
3	$-U_B$	$-U_B$	$-U_B$	$-U_B$	$-U_B$	$-U_B$	blue
4	D	E	D2	E2	-	D	black
2	-	-	D1	E1	I/U	I/U	white
5	COM	COM	COM	COM	COM	COM	grey

View on connector



Setting

Numerical setting via LED display

					
Press both keys until "Pro" for programming is shown on the LED display.	*Select the output to be set (according to sensor type d1, d2 or IU).*	*Via the LED display, set the switching point (or, with analogue outputs, the sensor-close window limit) in mm/cm.*	*If window mode is required for the switching output, the rear window limit must be set (or, with analogue outputs, the sensor-distant window limit) in mm/cm.*	*Select between NCC and NOC (or, with analogue outputs, between rising and falling characteristics).*	*Ready.*

For numerical input, the object to be detected needs not to be placed within the sensor´s detection range.



You have special requirements?

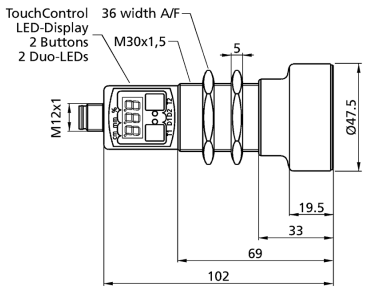
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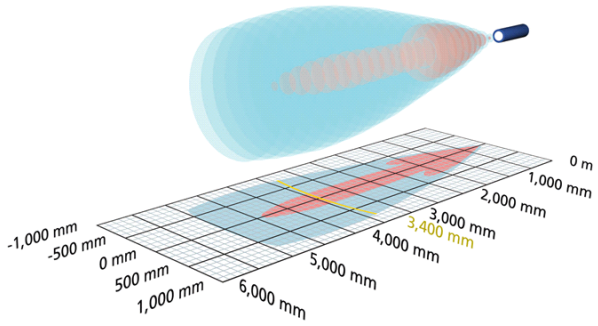
TECHNICAL SUPPORT TEAM ›

mic+340/D/TC

scale drawing



detection zone



1 x pnp

5,000 mm

measuring range	350 - 5.000 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	Display UL Listed

ultrasonic-specific

means of measurement	echo propagation time measurement
transducer frequency	120 kHz
blind zone	350 mm
operating range	3,400 mm
maximum range	5,000 mm
resolution	0.18 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)

electrical data

operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	≤ 80 mA
type of connection	5-pin M12 initiator plug

mic+340/D/TC

outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	50 mm
switching frequency	4 Hz
response time	172 ms
delay prior to availability	< 380 ms

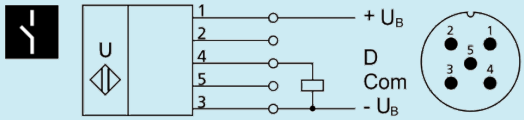
inputs	
input 1	com input synchronisation input

housing	
material	brass sleeve, nickel-plated, plastic parts, PBT, TPU
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
further versions	stainless steel cable connection (on request)
further versions	mic+340/D/TC/E

technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
Synchronisation	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	Display UL Listed

mic+340/D/TC

pin assignment



order no.	**mic+340/D/TC**

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