microsonic

Extract from our online catalogue:

# mic+25/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

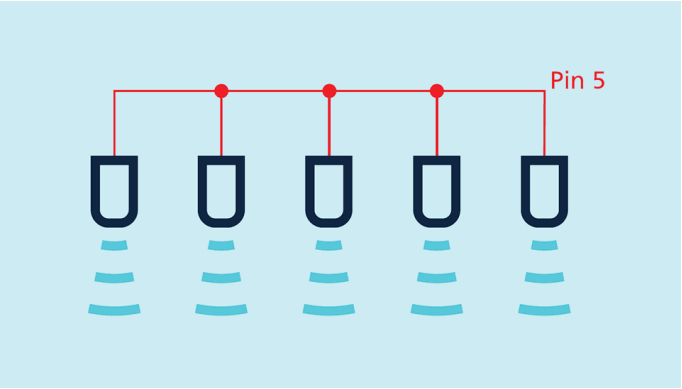
verify the load connected to the output and automatically switch to 4–20 mA current output and 0–10 V voltage output depending on the resistance value. The load verification by the sensor is always initiated upon connection of the operating voltage.

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).

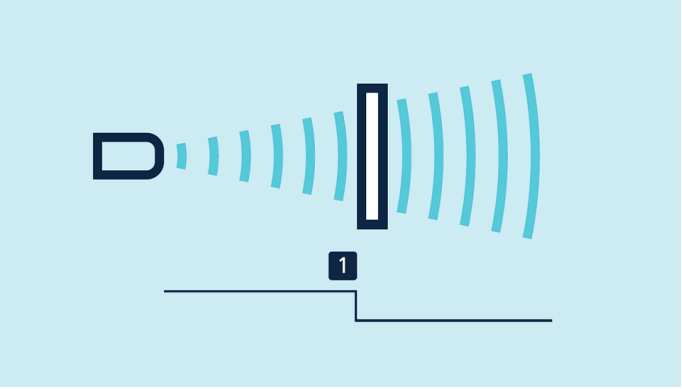
Each sensor is assigned an address from 1 to 10 for this purpose in the add-on menu. The sensors then work in multiplex mode and carry out their measurements one after the other in ascending address order.

### 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.

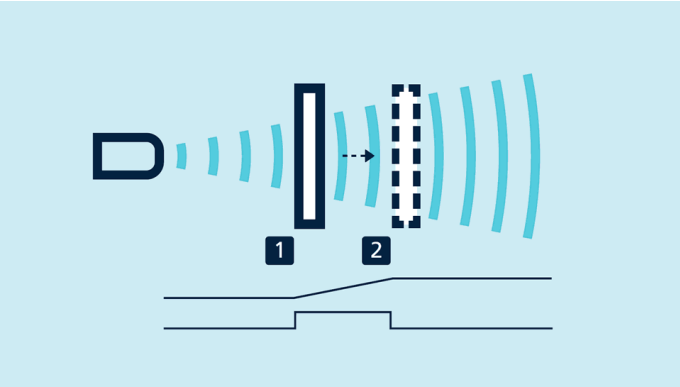



*Teach-in of a switching point*

### 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.



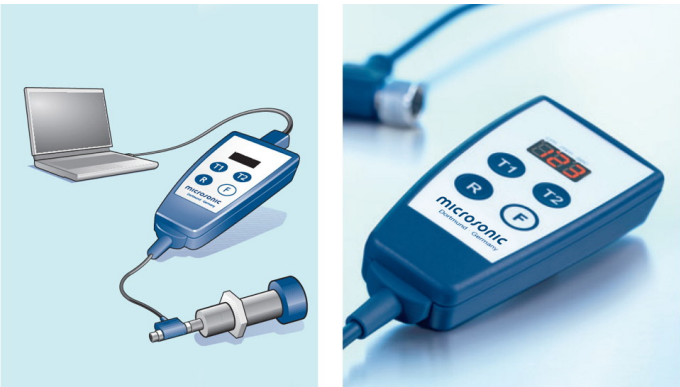

*Teach-in of an analogue characteristic curve or a window with two switching points*

### 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*

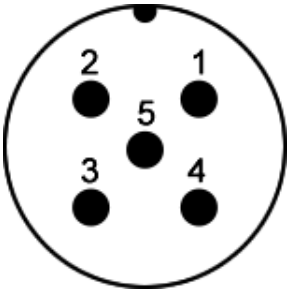
### IO-Link integrated

in version 1.1 for sensors with switching output.

## Pin assignment

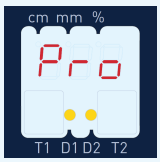
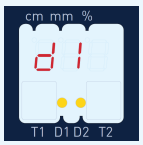
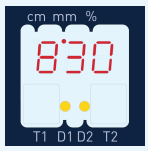
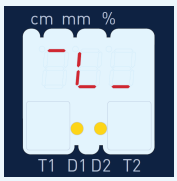
| Pin | PNP | NPN | PNP | NPN | Analogue output | 1 PNP output + Analogue | Colour code of sensor cable |
|---|---|---|---|---|---|---|---|
| 1 | $+U_B$ | $+U_B$ | $+U_B$ | $+U_B$ | $+U_B$ | $+U_B$ | brown |
| 3 | $-U_B$ | $-U_B$ | $-U_B$ | $-U_B$ | $-U_B$ | $-U_B$ | blue |
| 4 | D | E | D2 | E2 | -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

### View on connector

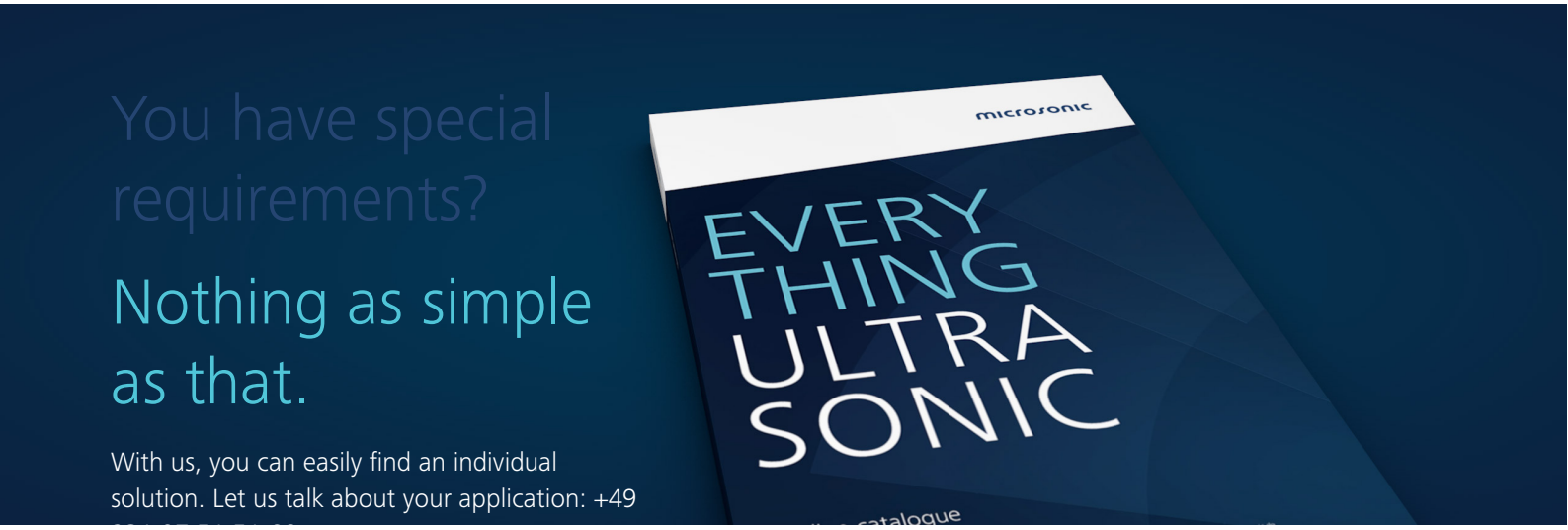


# Setting

## 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.* |

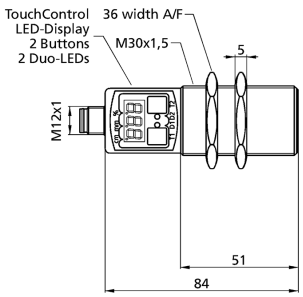
For numerical input, the object to be detected needs not to be placed within the sensor´s detection range.



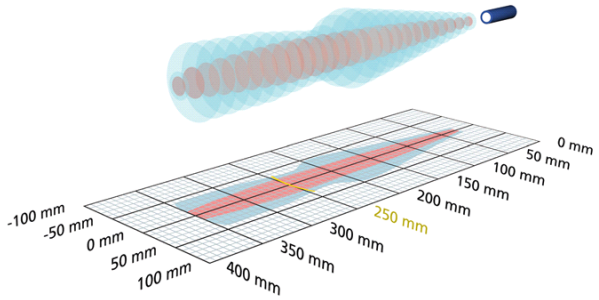

TECHNICAL SUPPORT TEAM ›

# mic+25/D/TC

## scale drawing




## detection zone




1 x pnp

350 mm

| | |
|---|---|
| measuring range | 30 - 350 mm |
| design | cylindrical M30 |
| operating mode | proximity switch/reflective mode<br>reflective barrier<br>window mode |
| particularities | Display<br>UL Listed |

### ultrasonic-specific

| | |
|---|---|
| means of measurement | echo propagation time measurement |
| transducer frequency | 320 kHz |
| blind zone | 30 mm |
| operating range | 250 mm |
| maximum range | 350 mm |
| resolution | 0.025 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+25/D/TC

| outputs | |
|---|---|
| output 1 | switching output<br>pnp: $I_{max}$ = 200 mA ($U_B$-2V)<br>NOC/NCC adjustable, short-circuit-proof |
| switching hysteresis | 3 mm |
| switching frequency | 25 Hz |
| response time | 32 ms |
| delay prior to availability | < 300 ms |

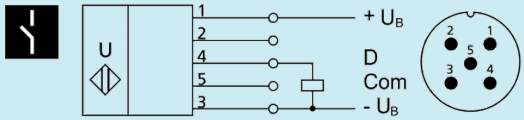
| inputs | |
|---|---|
| input 1 | com input<br>synchronisation input |

| 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 | 150 g |
| further versions | stainless steel<br>cable connection (on request) |
| further versions | mic+25/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<br>LCA-2 with LinkControl |
| Synchronisation | yes |
| multiplex | yes |
| indicators | 3-digit LED display, 2 x three-colour LED |
| particularities | Display<br>UL Listed |

# mic+25/D/TC

pin assignment




| | |
|---|---|
| order no. | **mic+25/D/TC** |

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