



Extract from our online catalogue:

mic+340/D/TC

Current to: 2013-07-30

*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 %** ::: *for immediately visible results*
- **Numeric configuration of the sensor using digital display** ::: *permits the complete advance configuration of the sensor*
- **Automatic synchronisation and multiplex operation** ::: *for simultaneous operation of up to ten Sensors in close quarters*

Basics

- **1 or 2 switching outputs in pnp or npn variants** ::: *for all controllers*
- **Analogue output 4–20 mA and 0–10 V** ::: *with automatic switching between current and voltage outputs*
- **Analogue output plus 1 pnp switching output** ::: *for proportional distance measurement with an additional limit value*
- **5 Detection ranges with a measurement range of 30 mm to 8 m** ::: *individually appropriate for the use case*
- **microsonic teach-in using T1 or T2 buttons** ::: *for simple, uniform commissioning*
- **0.025 mm to 0.18 mm resolution** ::: *for the highest precision possible*
- **Temperature compensation** ::: *for exact measurement in temperature fluctuations*
- **9–30 V operating voltage** ::: *for use on a variety of voltage networks*
- **LinkControl** ::: *for configuration of sensors from the 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 0.18 mm. All sensors are equipped with an integrated temperature compensation.



TouchControl with LED Display (l.), Winding diameter measuring at the laminating machine (r.)

Four different output levels

are available for all five detection ranges:



1 switching output, optionally in pnp oder npn circuitry



2 switching output, optionally in pnp oder 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 well readable LED display constantly shows the current distance value and automatically alternates between mm and cm 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 detect 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. The measured distance value may, e.g., be stressed by means of the tenstage software filter, from F0 (direct measuring value output without filtration) to F9 (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 F1. 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

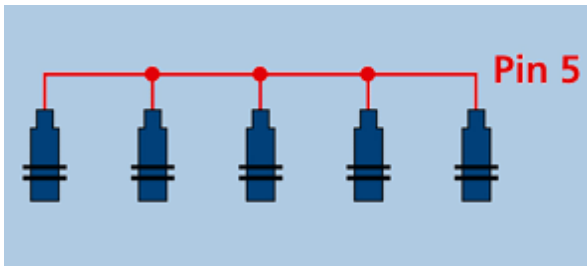
verify the load connected to the output and automatically switch to 4–20 mA current and 0–10 V voltage output in dependence of the resistance value. The load verification by the sensor is always initiated upon connection of the operating voltage.

In the add-on-menu of TouchControl, the user can, however, also pre-set 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 percentage indication. The window limits of the analogue characteristic curve then correspond to the 0% or the 100% value respectively.

Synchronisation

of up to 10 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 10 sensors must be synchronised, this can be carried out with the SyncBox1, 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 0 to 9 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.

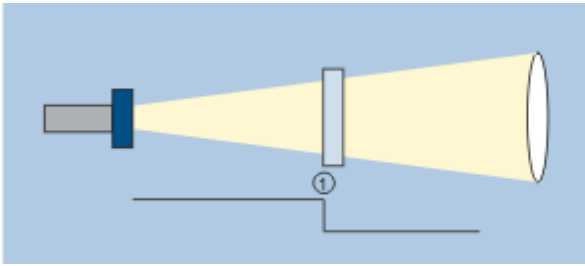
The setting of a switching or an analogue output

is either carried out by means of numerically entering the desired distance values (refer to graphic left below) or by means of a teach-in procedure (refer to this page).

Thanks to this, the user can select his preferred setting mode.

In the microsonic teach-in process

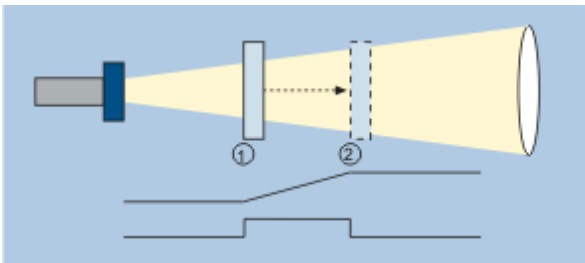
the object to be detected must be placed in the desired distance (1) to the sensor. The button assigned to the output must then be pressed until **TEACH d1** (or **TEACH d2**) appears on the LED display. Finally, the teach-in-procedure must be confirmed by a further short keystroke. Ready.



Teach-in of a detect point

For the setting of 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.

For the setting of 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 detect points

NCC/NOCC

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 \overline{L} bzw. \overline{U} appears on the display. With each further keystroke, the NCC/NOCC (\overline{J} / \overline{L}) and rising/falling ($\overline{-}$ / $\overline{+}$) 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 out 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 (also refer to chapter Accessories).

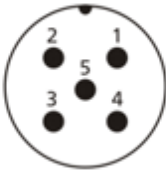


Sensor connected to the PC via LCA-2 for programming



Pin assignment

| PIN |  | |  | |  |  | COLOUR CODE OF SENSOR CABLE |
|-----|---|-----------------|---|-----------------|---|---|--------------------------------|
| | PNP | NPN | PNP | NPN | ANALOGUE OUTPUT | 1 PNP OUTP. + ANALOGUE | |
| 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 | IU | IU | white |
| 5 | COM | COM | COM | COM | COM | COM | grey |

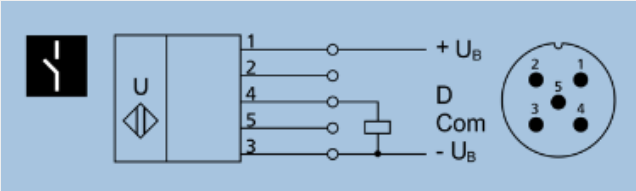
View on connector



mic+340/D/TC

| | |
|---|--|
| scale drawing | detection zone |
| | |
|  1 x pnp |  5,000 mm |
| operating range | 350 - 3,400 mm |
| design | cylindrical M30 |
| operating mode | proximity switch/reflective mode reflective barrier window mode |
| particularities | display |
| 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 |
| angle of beam spread | please see graphics detection zone |
| resolution/sampling rate | 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: $I_{\max} = 200 \text{ mA}$ ($U_B - 2V$) NOC/NCC adjustable, short-circuit-proof |
| switching hysteresis | 50 mm |
| switching frequency | 3 Hz |
| response time | 180 ms |
| delay prior to availability | < 300 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 | 165 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 |
| synchronization | yes |
| multiplex | yes |
| indicators | 3-digit LED display, 2 x three-colour LED |
| particularities | display |
| documentation (download) | |
| pin assignment |  |