

ultrasonic sensors



ultrasonic sensors emit short, high-frequency sound pulses at regular intervals. These propagate in the air at the velocity of sound. If they strike an object, they are reflected back as echo signals to the sensor, which computes the distance to the target based on the timespan between emitting the signal and receiving the echo. As the distance to an object is determined by measuring the time of flight and not by the intensity of the sound, ultrasonic sensors are excellent at suppressing background interference.

mic / mic+

mic ultrasonic sensors feature a solid metal construction and are available in two device designs with five different detection ranges. They feature a teach-in via pin 5 of the M12 circular connector and LinkControl for sensor setting via PC.

mic+ sensors are available in four device designs with five different detection ranges. Through TouchControl all sensor settings are made. The easy to read LED display constantly shows the current distance value and automatically alternates between mm and cm indication.



*mic+ features LED display with TouchControl

pico+

pico+ compact series features M18 threaded sleeves and only 41 mm in housing length. In addition to the variants with an axial beam direction, there is also a housing variant with a 90° angled head and radial beam direction.

With four detection ranges from 20 mm to 1.3 m and three different output stages, this sensor family covers a wide range of applications.

Sensors with the Push-Pull output stage support SIO and IO link modes. Sensors with analogue output are optionally available with 4–20 mA current output or 0–10 V voltage output.



dbk+4 / dbk+5

The new dbk+4 has 3 control inputs by which 3 working ranges can be pre-selected. The standard working ranges cover the sheet material weight range from 20 g/m² to 1,200 g/m². Extremely thin materials such as thin printing paper with weight per unit areas of less than 20 g/m² are scanned with the use of the "Thin" setting. The "Thick" setting is available for paperboard containers and corrugated card.

The dbk+5 ultrasonic double sheet control is designed for scanning thin sheet metal, plastic sheets and corrugated card with thicknesses exceeding the working range of the dbk+4 sensors. The principle behind the operation is the same as for the dbk+4 sensors. The main difference between the systems lies in the materials to be detected.



esp

The esp can reliably detect high-transparency, reflective materials as well as metallised labels. Labels are guided through the fork. An ultrasonic transmitter in the lower tine of the fork beams a fast sequence of pulses through the backing material. The sound pulses cause the backing material to vibrate, so that a greatly attenuated sound wave is beamed from the opposite side. The receiver in the upper tine of the fork receives this sound wave.

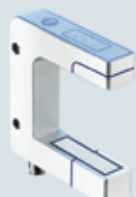
The backing material transmits a different signal level from the label. This signal difference is evaluated by the esp. The signal difference between the backing material and the label can be very small. To ensure a reliable distinction, the esp must be trained to the label.



bks / bks+

The bks/bks+ ultrasonic edge sensor is a fork sensor for scanning the edges of sound-impermeable materials such as foil or paper. This is why the bks is ideally suited for the web control of highly transparent foils, light-sensitive materials, materials with greatly varying transparency and paper subject to high paper dust loads.

The fork's lower leg is equipped with an ultrasonic sensor which cyclically emits short sound impulses, which are detected by the ultrasonic receiver arranged in the upper fork leg. Material immersing into the fork covers this sound path and thus attenuates the received signal in dependence of the coverage, which is evaluated by internally. An analogue signal is output in dependence of the coverage degree.



accessories

LCA-2 - The LinkControl adapter LCA-2 is equipped with a USB interface for connection to a PC or laptop.

With the LinkControl software, the ultrasonic sensors of the mic+, mic, vnp, pico+, ipc, lcs, ucs, crm+, hps+, dbk+4, dbk+5, esp-4 and esp series can be parameterised under Windows®.

SyncBox - For the external synchronisation of more than 10 mic+ sensors

SyncBox2 - For the external synchronisation of zws sensors. About 50 zws sensors can be synchronised.

Other available Accessories Include:

- Cables
- Deflectors
- Mounting Accessories



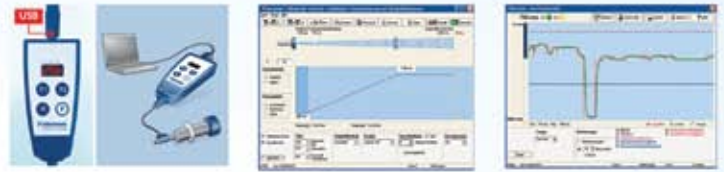
teach-in

Ultrasonic sensors from TR give the opportunity for programmability. This makes changing limits, or setting the scaling of analog outputs quick and easy. Using integrated push buttons and LCD display; or the free software (adapter required), many functions can be adjusted to meet your applicational needs.

TR offers a variety of other ultrasonic sensors including vnp, ipc, zws and esp series.
Contact us for details!

LinkControl Software

With LinkControl Software the ultrasonic sensors of the mic+-, mic-, vnp, pico+, ipc, lcs, ucs, crm+, hps+, dbk+4, dbk+5, esp-4 and esf series can be parameterised under Windows®.



settings



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 detect 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.

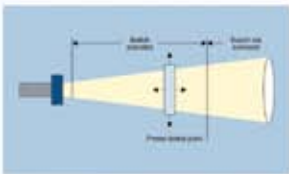


Select between NCC/NOC (or, with analogue outputs, between rising / falling characteristics).



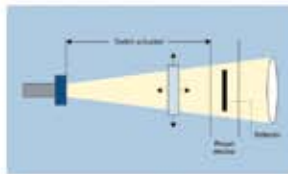
Ready.

operating modes



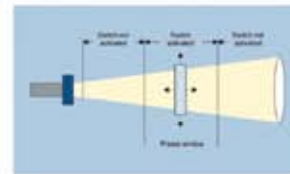
proximity switch / reflective mode

represents the classic method of operation. Here, the switch is activated as soon as the target is located within the preset detect point.



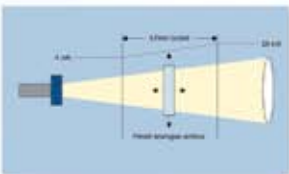
reflective barrier mode

operates in a similar way to a photoelectric barrier. However, no special triple reflector or similar device is needed. Any reflector, e.g. a metal flag, is adequate.



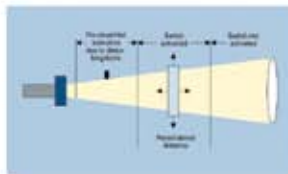
window mode

is an extension of the reflective mode. In this case the switch is only activated when the target is located within a window defined by two window limits.



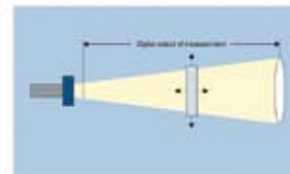
analogue distance measurement mode

transmits the measurement as a proportional voltage (0-10 V) or current (4-20 mA).



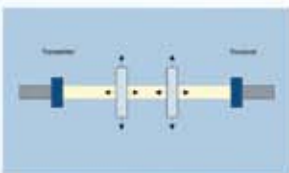
foreground suppression mode

ignores all echo signals closer than the preset detect distance. This can disregard minor disturbing items which protrude into the foreground of the detection zone.



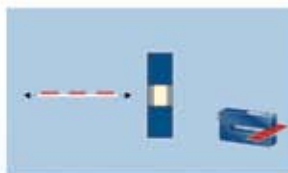
ultrasonic sensor with IO-Link

permits continuous communication on all levels of the system architecture, from the sensor to the upper fieldbus level.



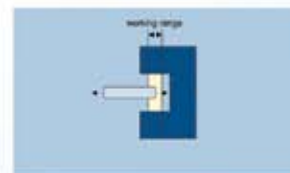
double sheet controllers

operates as a one-way barrier and detects two or more sheets inadvertently stuck together. The transmitter-receiver arrangement can scan papers, films, cardboard and thin sheet metal.



label and splice sensors

works on the same principle as ultrasonic double sheet controls. Since the interior adhesion of the labels to the backing material represents a joint without a separating air layer, label sensors must be calibrated to the backing material and the labels.



edge sensors

designed as fork sensors and also work as a one-way barrier. They are used for path control and emit an analogue signal of 0-10 V or 4-20 mA which is proportional to the orientation of the path edge.