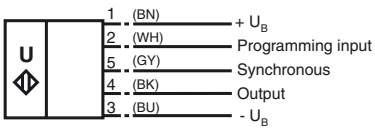
Ultrasonic sensor
UB1000-18GM75-PWM-V15

Features

- PWM output
- 3 different options of outputs parameterisable
- Paramaterisation input
- Synchronisation options
- Deactivation option
- Temperature compensation

Electrical connection

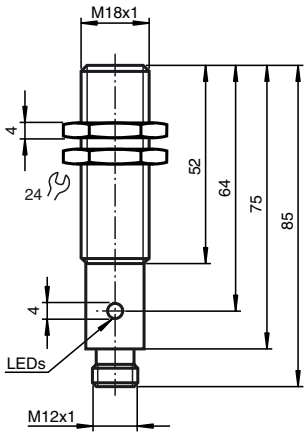
Standard symbol/Connections:



Core colours in accordance with EN 60947-5-2.

Connector V15

Dimensions



Technical data

CE

General specifications	
Sensing range	80 ... 1000 mm
Unusable area	0 ... 80 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 205 kHz
Response delay	approx. 150 ms
Indicators/operating means	
LED green	Power on
LED red	flashing: error(br>permanent: no object detected
Electrical specifications	
Operating voltage	10 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	≤ 50 mA
Input/output	
Synchronisation	1 synchronous connection, bi-directional 0-level: $-U_B$...+1 V 1-level: +4 V...$+U_B$ input impedance: > 12 kΩ synchronisation pulse: ≥ 100 µs, synchronisation interpulse period: ≥ 2 ms
Synchronisation frequency	
Common mode operation	≤ 30 Hz
Multiplex operation	≤ 30/n Hz, n = number of sensors
Input	
Input type	1 Parameterisation input Input impedance: > 4.7 kΩ
Output	
Output type	1 PWM output, push/pull, parameterisable
Resolution	1 mm
Deviation of the characteristic curve	± 1 % of full-scale value
Repeat accuracy	± 0.5 % of full-scale value
Load impedance	> 1000 Ohm < 100 nF
Temperature influence	± 1.5 % of full-scale value
Standard conformity	
Standards	EN 60947-5-2
Ambient conditions	
Ambient temperature	-25 ... 70 °C (248 ... 343 K)
Storage temperature	-40 ... 85 °C (233 ... 358 K)
Mechanical specifications	
Protection degree	IP65
Connection	connector V15 (M12 x 1), 5 pin
Material	
Housing	brass, nickel-plated
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass	60 g

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Notes

Parameter assignment of the signal output
The ultrasonic sensor is equipped with a signal output that represents the distance determined to the object in the form of a pulse-duty factor proportional to the distance of the object. The current path characteristic of this output signal follows a zero-point straight line, i.e. the extrapolated pulse-duty factor for the object distance 0 (not usable in practice) also corresponds to 0. As the distance to the object increases, the pulse-duty factor also increases. It is 50 % when the nominal sensing range is reached.
The object distance can be calculated according to:

Object distance [mm] = 2 * sensing range [mm] * pulse length [s] * frequency [Hz]

If the object distance reaches or exceeds twice the nominal detection range, or if no object is detected, a level 1 is permanently present on the output.
The frequency of the output channel is adjusted by the wiring arrangement of the parameterisation input.

Wiring arrangement of the parameterisation input	Output frequency
$-U_B$	30 Hz
Not used	245 Hz
$+U_B$	1900 Hz

The sensor checks the parameterisation input when the operating voltage is switched on. A change in the wiring of the parameterisation input during ongoing operation has no effect on the signal output.

LED display
The sensor is equipped with 2 LEDs. Their meaning is as follows:

LED green: Operating voltage applied
LED red: No object detected

Synchronisation
The sensor features a synchronisation input for the suppression of mutual interference. If this input is not used, the sensor will operate using an internally generated clock rate. The synchronisation of multiple sensors can be implemented as follows:
External synchronisation
The sensor can be synchronised by the external application of a square wave voltage. A synchronisation pulse at the synchronisation input starts a measuring cycle. The pulse must have a duration greater than 100 µs. The measuring cycle starts with the falling edge of a synchronisation pulse. A low level > 1 s or an open synchronisation input results in normal operation of the sensor. A high level at the synchronisation input disables the sensor.
Two operating modes are available
1) Multiple sensors can be controlled by the same synchronisation signal. The sensors work on the same clock rate.
2) The synchronisation pulses are sent cyclically to only one sensor at a time. The sensors operate in multiplex mode.

Internal synchronisation
The synchronisation connections of up to 5 sensors capable of internal synchronisation are connected to one another. When power is applied, these sensors operate in multiplex mode. The response delay increases according to the number of sensors to be synchronised.

Note
If the option for synchronisation is not used, the synchronisation input should be connected with ground (0 V) or the sensor should be operated with a V1 cable connector (4-pin).

Installation conditions

If the sensor is installed at places, where the environment temperature can fall below 0 °C, for the sensors fixation, one of the mounting flanges BF18, BF18-F or BF 5-30 must be used.

In case of direct mounting of the sensor in a through hole using the steel nuts, it has to be fixed at the middle of the housing thread. If a fixation at the front end of the threaded housing is required, plastic nuts with centering ring (accessories) must be used.

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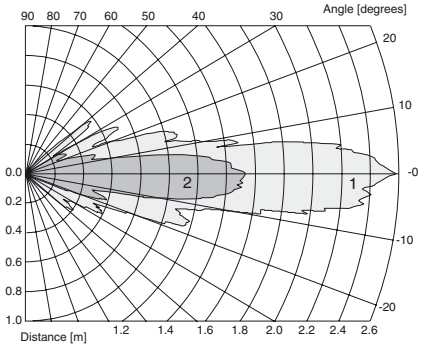
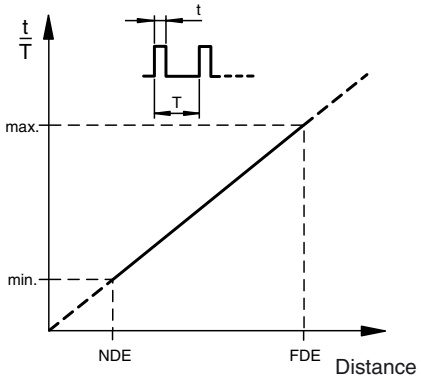
Characteristic curves/additional information

Characteristic response curves

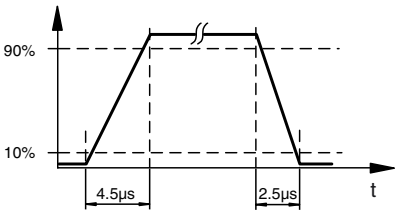


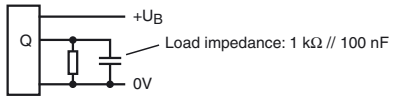
Curve 1: flat plate 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

Output characteristic



Rise-/fall time of output signal





Accessories

Mounting aids/fixing flanges
OMH-04
BF 18