**Ultrasonic sensor**

# UB1000-18GM75-BIT-V15

## Dimensions



LED green    LED red

## Features

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

## Technical data   $C\epsilon$

### 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 $I_0$ | $\leq$ 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 k$\Omega$ |
| | synchronisation pulse: $\geq$ 100 $\mu$s, synchronisation interpulse period: $\geq$ 2 ms |
| Synchronisation frequency | |
|   Common mode operation | $\leq$ 30 Hz |
|   Multiplex operation | $\leq$ 30/n Hz, n = number of sensors |

### Input
| | |
|---|---|
| Input type | 1 Parameterisation input |
| | Input impedance: > 4.7 k$\Omega$ |

### Output
| | |
|---|---|
| Output type | 1 serial output, push/pull, parameterisable |
| Resolution | 1 mm |
| Deviation of the characteristic curve | $\pm$ 1 % of full-scale value |
| Repeat accuracy | $\pm$ 0.5 % of full-scale value |
| Load impedance | > 1000 Ohm < 100 nF |
| Temperature influence | $\pm$ 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 |

## Electrical connection

**Standard symbol/Connections:**



| | | |
|---|---|---|
| 1 | (BN) | + $U_B$ |
| 2 | (WH) | Programming input |
| 5 | (GY) | Synchronous |
| 4 | (BK) | Output |
| 3 | (BU) | - $U_B$ |

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

## Connector V15

### 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 digital value 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 digital value for the object distance 0 (which is not usable in practical terms) also corresponds to 0. As the object distance increases, the digital value also increases. The digital value is generated serially. A word consists of 1 start bit (level 1), 12 data bits (value), and 1 stop bit (level 0).

The object distance can be calculated according to:

*Object distance [mm] = Value / 2*

If no object is detected, a level 1 is permanently present on the output.
The bit width is adjusted by the wiring arrangement of the parameterisation input.

| Wiring arrangement of the parameterisation input | Bit width |
|---|---|
| $-U_B$ | 50 µs |
| Not used | 100 µs |
| $+U_B$ | 200 µs |

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.

## UB1000-18GM75-BIT-V15

## Characteristic curves/additional information

### Characteristic response curves
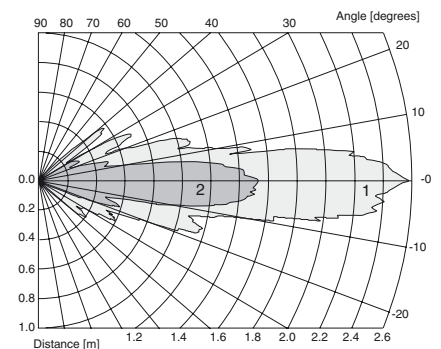


Curve 1: flat plate 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

**Output characteristic**
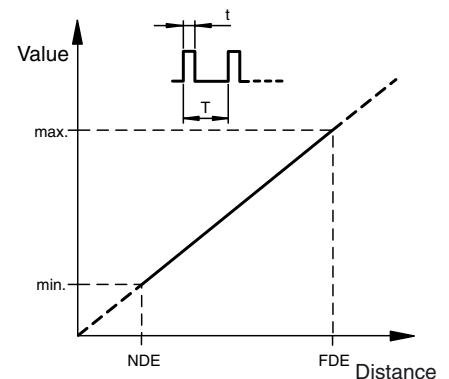


**Rise-/fall time of output signal**
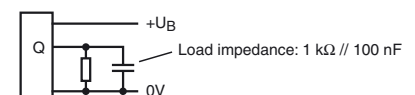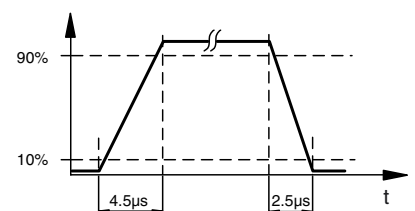


## Accessories

### Mounting aids/fixing flanges

OMH-04

BF 18