

Single head system



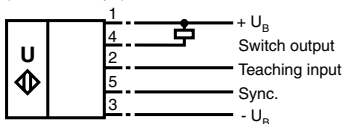
UB500-18GM75-E4-V15

Features

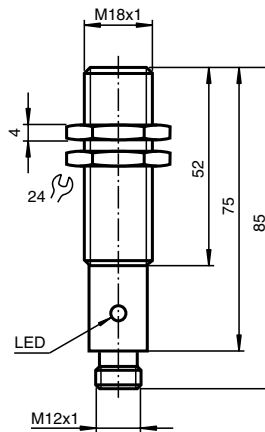
- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Synchronisation options
- Deactivation option
- Temperature compensation

Electrical connection

Standard symbol/Connections:
(version E4, npn)



Dimensions



CE

Technical data

General specifications

| | |
|-----------------------|-----------------|
| Sensing range | 50 ... 500 mm |
| Standard target plate | 100 mm x 100 mm |
| Unusable area | 0 ... 50 mm |
| Transducer frequency | approx. 380 kHz |
| Response delay | approx. 50 ms |
| Standard conformity | EN 60947-5-2 |

Indicating/Operating means

LED yellow

indication of the switching state
flashing: teach-in function object detected
"Error", object uncertain
in teach-in function: No object detected

LED red

Electrical specifications

| | |
|---------------------------------|---|
| Rated operational voltage U_e | 10 ... 30 V DC, ripple 10 % _{SS} |
| No-load supply current I_0 | ≤ 50 mA |

Input/Output

Synchronisation

1 synchro input
0-level: $-U_B \dots +1V$; 1-level: $+4V \dots +U_B$
input impedance: $>12 \Omega$
synchronisation pulse: $\geq 100 \mu s$
synchronisation pulse interval: $\geq 2 ms$

Output

| | |
|---------------------------------|--|
| Output type | 1 switch output E4, npn NO/NC |
| Rated operational current I_e | 200 mA, short circuit/overload protected |
| Voltage drop U_d | ≤ 3 V |
| Switching frequency f | max. 10 Hz |
| Range hysteresis H | ≤ 1 % of the set operating distance |
| Repeat accuracy | ≤ 1 % |
| Temperature influence | ≤ 3 % |

Input

Input type

1 teach-in input,
operating range 1: $-U_B \dots +1 V$
operating range 2: $+4 V \dots +U_B$
input impedance: $>4,7 k\Omega$; teach-in pulse: $\geq 1 s$

Synchronisation frequency

Common mode operation

≤ 100 Hz

Multiplex operation

≤ 100 / n Hz, n = number of sensors

Ambient conditions

| | |
|---------------------|--------------------------------|
| Ambient temperature | -25 ... +70 °C (248 ... 343 K) |
| Storage temperature | -40 ... +85 °C (233 ... 358 K) |

Mechanical specifications

| | |
|-------------------|--------------------------------|
| Protection degree | IP65 according to EN 60529 |
| Connection type | 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

Note

Function

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 realised 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 μ s. The measuring cycle starts with the falling edge of a synchronisation pulse. Two operating modes are available:

1. Multiple sensors can be controlled by the same synchronisation signal. The sensors are synchronised.
2. The synchronisation pulses are sent cyclically to individual sensors. 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 will operate in multiplex mode.

The state of the switch output will not change until the switching threshold has been exceeded five times as an average of the five measurements is determined internally. A low level > 1 s or an open synchronisation input will result in the normal operation of the sensor.

Synchronisation cannot be performed during TEACH-IN and vice versa. The sensors must be operated in an unsynchronised manner to teach the switching point.

A high level at the synchronisation input disables the sensor.

Setting the switching points

The ultrasonic sensor features a switch output with two teachable evaluation limits. These are set by applying the supply voltage -UB or +UB to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. Evaluation limit A1 is taught with - UB, A2 with + UB.

Five different output functions can be set:

1. Window mode, close function
2. Window mode, open function
3. One switching point, close function
4. One switching point, open function
5. Detection of object presence

Teach window mode, close function:

- Set target to near switching point
- Teach switching point A1 with -UB
- Set target to far switching point
- Teach switching point A2 with +UB

Teach window mode, open function:

- Set target to near switching point
- Teach switching point A2 with +UB
- Set target to far switching point
- Teach switching point A1 with -UB

Teach one switching point, close function:

- Set target to near switching point
- Teach switching point A2 with +UB
- Cover sensor with hand or remove all objects from sensing range
- Teach switching point A1 with -UB

Teach one switching point, normally-closed function:

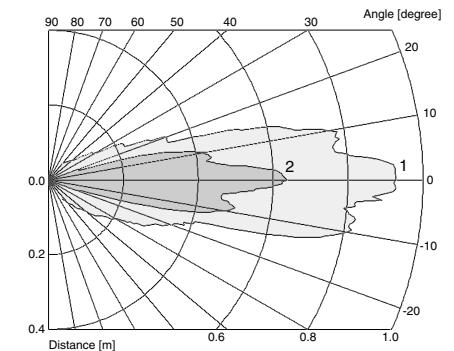
- Set target to near switching point

Model number

UB500-18GM75-E4-V15

Characteristic curves/ Additional information

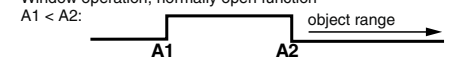
Characteristic response curve



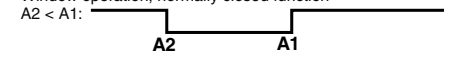
Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

Programmed switching output function

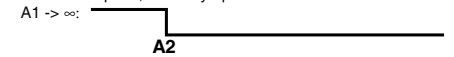
Window operation, normally open function



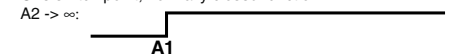
Window operation, normally closed function



One switch point, normally open function



One switch point, normally closed function



A1 -> ∞, A2 -> ∞: Detection of presence of object

Object detected: Switch output closed

No object detected: Switch output open

- Teach switching point A1 with -UB
- Cover sensor with hand or remove all objects from sensing range
- Teach switching point A2 with +UB

Teach detection of object presence

- Cover sensor with hand or remove all objects from sensing range
- Teach switching point A1 with -UB
- Teach switching point A2 with +UB
- Default setting of switching points:
- A1: switching point 1, A2: switching point 2

| Displays in dependence on operating mode | Red LED | Yellow LED |
|--|----------|-----------------|
| Teach switch point: | | |
| Object detected | Off | Flashing |
| No object detected | Flashing | Off |
| Object uncertain (TEACH-IN invalid) | On | Off |
| Normal operation | Off | Switching state |
| Fault | On | Previous state |

