



**Model Number**

ULB-18GM50-255-2E3

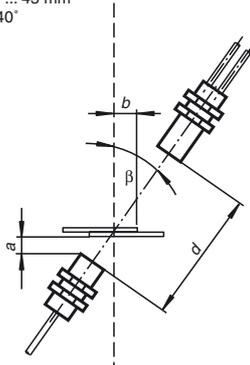
**Features**

- Ultrasonic system for detection of labels and carrier materials.
- Short version
- Insensitive to printing, colors, and shining surfaces
- Automatic compensation of the operating point with slowly changing ambient condition
- Very high processing speeds are possible.

**Diagrams**

**Mounting/Adjustment**

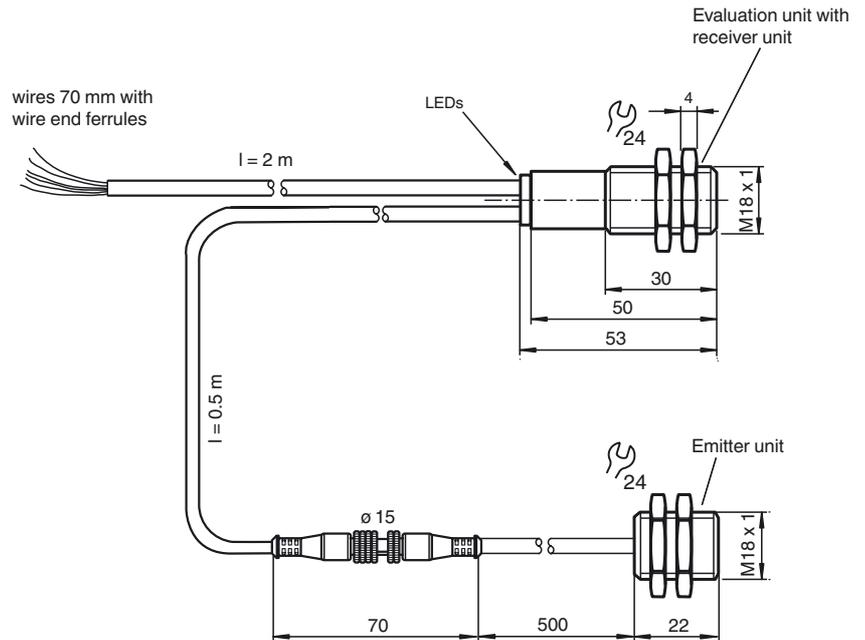
Suggestions:  
 a = 5 mm ... 15 mm  
 b ≥ 10 mm  
 d = 40 mm ... 45 mm  
 β = 20° ... 40°



**Technical data**

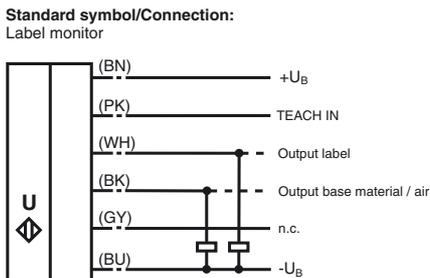
<b>General specifications</b>	
Sensing range	20 ... 60 mm , optimal distance: 45 mm
Transducer frequency	255 kHz
<b>Indicators/operating means</b>	
LED green	Display: readiness
LED yellow	indication: label detected
LED red	Display: error
<b>Electrical specifications</b>	
Operating voltage $U_B$	18 ... 30 V DC , ripple 10 % <sub>SS</sub>
No-load supply current $I_0$	< 60 mA
Time delay before availability $t_v$	< 500 ms
<b>Input</b>	
Input type	Teach-In input 0-level: $-U_B ... -U_B + 1V$ 1-level: $+U_B - 1V ... +U_B$
Pulse length	≥ 500 ms
Impedance	≥ 10 kΩ
<b>Output</b>	
Output type	2 switch outputs PNP, NC
Rated operating current $I_e$	2 x 100 mA , short-circuit/overload protected
Voltage drop $U_d$	≤ 3 V
Switch-on delay $t_{on}$	≤ 600 μs
Switch-off delay $t_{off}$	≤ 600 μs
<b>Ambient conditions</b>	
Ambient temperature	0 ... 60 °C (32 ... 140 °F)
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>	
Connection type	cable PVC , 2 m
Core cross-section	0.14 mm <sup>2</sup>
Degree of protection	IP67
Material	
Housing	nickel plated brass; plastic components: PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass	150 g
<b>Compliance with standards and directives</b>	
Standard conformity	
Standards	EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012
<b>Approvals and certificates</b>	
UL approval	C-UL listed: 57M3, IND CONT. EQ., "Powered by Class 2 Power Source"
CCC approval	CCC approval / marking not required for products rated ≤36 V

**Dimensions**



Release date: 2017-09-07 16:17 Date of issue: 2017-09-07 193007\_eng.xml

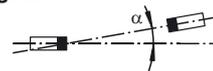
**Electrical Connection**



**Additional Information**

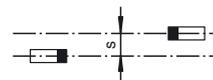
**Angular misalignment**

$\alpha < +/- 1^\circ$



**Sensor offset**

$s < +/- 1 \text{ mm}$



**Accessories**

**MH-UDB01**

Mounting bracket for double sheet monitor

**Operation in applications with increased ESD requirements**

Using the included metal screw caps, the sensor can be used in applications with increased ESD requirements up to 30 kV (ESD = electrostatic discharge). The metal coupling nuts are screwed on the front of the transmitter and receiver. The installation of the transmitter and receiver must ensure a large area electrical connection to the machine earth.

**Description of sensor functions**

The ultrasonic double sheet monitor for label detection can be used in all applications, where an automatic detection of labels is required, to automatise labelling of goods. Even transparent or metalised labels can be detected without problem. The double-sheet monitor is based on the ultrasonic through-beam principle. The following can be detected:

- No base material, i.e. air,
- Labels

A microprocessor system evaluates the signals. The appropriate switch outputs are set as a result of the evaluation. Changes in ambient conditions such as temperature and humidity are compensated for automatically. The interface electronics is integrated into a compact M18 metal housing together with a sensor head.

**Electrical connection**

The sensor is equipped with 6 connecting wires. The functionality of the connections is described in the following table. The teach input (PK) is used to teach the sensor.

Colour	Switching on	Comments
BN	+U <sub>B</sub>	
WH	Switch output for labels	Pulse width corresponds to the event
BK	Switch output for base material / air	Pulse width corresponds to the event
GY	not connected	
PK	-U <sub>B</sub> / n.c. / +U <sub>B</sub>	Normal operation / TEACH-IN
BU	-UB	

**Normal mode**

The sensor is working in normal mode if the function input (PK) is applied to -U<sub>B</sub> or not connected.

Displays:

- LED yellow: Detection of labels
- LED green: Power on
- LED red: Error

Switch outputs:

The switch outputs are only active in normal operation!

- White: WH Label output
- Black: BK Base material / air output

Release date: 2017-09-07 16:17 Date of issue: 2017-09-07 193007\_eng.xml

**TEACH-IN mode**

Connecting the teach input (PK) with +U<sub>B</sub> for at least 500 ms causes the sensor to change into TEACH-IN mode. The TEACH-IN procedure takes place by the transition from label to base material. We suggest to accomplish the TEACH-IN procedure with activated material feeding and multiple label/base material transitions.

During the TEACH-IN procedure flashes the yellow LED; the green LED is off.

After returning to the normal operation mode (teach input (PK) detached from +U<sub>B</sub>) the sensor indicates whether the TEACH-IN procedure was successful or not.

TEACH-IN procedure successful: green LED flashes 3 times

TEACH-IN procedure not successful: red LED flashes 3 times

**Notes:**

A complete device consists of an ultrasonic emitter and an evaluation unit with an ultrasonic emitter. The sensor heads are optimally adjusted to each other when they leave the factory. Therefore, they must not be used separately or exchanged with other devices of the same type. The plug connector on the emitter/receiver connection cable is only intended to be used for easier mounting, not to replace units.

If two or more double sheet controls are used in the immediate vicinity of each other, there may be mutual interference between them, which can result in improper functionality of the devices. Mutual interference can be prevented by introducing suitable countermeasures when planning systems. Suitable measures can be:

- Mounting of sound absorbers (foam material)
- mounting of sound separators (sheet metal)
- installation of the sensors with different directions of sound transmission.