Background suppression sensor

ML100-8-H-100-5986

- Diffuse mode sensor with multiple light spots
- Specially designed for detecting critical objects such as PCBs
- Miniature design
- Detects objects in front of a close background through precise background suppression
- Can be adapted to the application in question thanks to the adjustable detection range
- Precision object detection, almost irrespective of the color
- Not sensitive to ambient light, even with switched energy saving lamps

Diffuse mode sensor with special light spots for detecting PCBs, background suppression, miniature design, 100 mm detection range, red light, light on, PNP output, fixed cable with M8 plug

Function

The optical sensors of this series are suitable for both standard and demanding applications.
The series features a miniature housing design, two M3 metal-threaded mounting holes and a highly visible LED status indicator.
Each device is equipped with a sensitivity adjuster and a light-on/dark-on changeover switch for increased flexibility.
A wide variety of versions are available in both infrared light and red light with PowerBeam for easy alignment.
Special versions with BlueBeam are suitable for challenging applications like those in the solar and battery industries.

Application

Container handling
- Target sensor
- Control movement on conveyors
- Stack height monitoring

General assembly applications
- Presence monitoring
- Congestion monitoring
- Track loading
- Completeness check

Doors, gates and elevators
- Person detection for automatic doors and gates
- Protection for closing edges on sliding and revolving doors
- Threshold monitoring for elevator doors
- Activation function for restarting escalators

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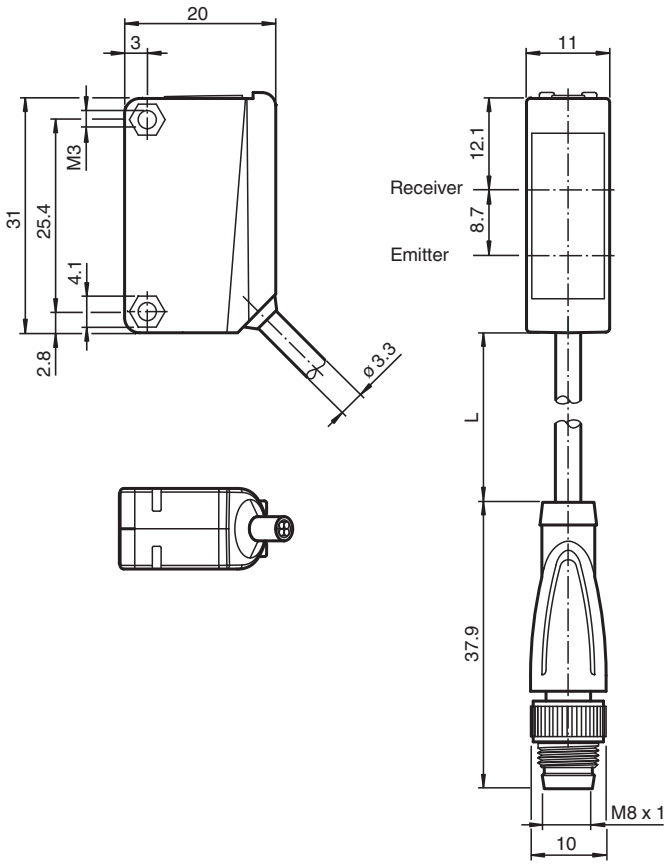
Dimensions



Technical Data

General specifications		
Detection range		20 ... 100 mm
Detection range min.		10 ... 25 mm
Detection range max.		25 ... 100 mm
Adjustment range		25 ... 100 mm
Reference target		standard white, 100 mm x 100 mm
Light source		LED
Light type		modulated visible red light
Polarization filter		no
Black-white difference (6 %/90 %)		< 20 %
Diameter of the light spot		3 light spots, spotsize 4 mm at a distance of 50 mm, spots are 8 mm apart; spotsize 2.5 mm at a distance of 80 mm, spots are 12 mm apart; spotsize 4 mm at a distance of 100 mm, spots are 15 mm apart
Optical face		frontal
Ambient light limit		EN 60947-5-2:2007+A1:2012
Functional safety related parameters		
$MTTF_d$		1100 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		LED green: power on
Function indicator		LED yellow: lights when object is detected , flashes when in adjustment mode
Control elements		Sensing range adjuster

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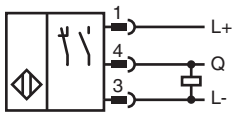
Technical Data

Control elements		Light-on/dark-on changeover switch
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I_0	< 15 mA
Output		
Switching type		The switching type of the sensor is adjustable. The default setting is: light-on
Signal output		1 PNP output, short-circuit protected, reverse polarity protected, open collector
Switching voltage		max. 30 V DC
Switching current		max. 100 mA , resistive load
Voltage drop	U_d	≤ 1.5 V DC
Switching frequency	f	500 Hz
Response time		1 ms
Conformity		
Product standard		EN 60947-5-2
Approvals and certificates		
UL approval		cULus Listed, Class 2 Power Source or listed Power Supply with a limited voltage output with (maybe integrated) fuse (max. 3.3 A according UL248), Type 1 enclosure
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Degree of protection		IP67
Connection		400 mm fixed cable with plug with M8 connector, 3-pin
Material		
Housing		PC (Polycarbonate)
Optical face		PMMA
Mass		approx. 50 g
Tightening torque, fastening screws		0.6 Nm
Dimensions		
Height		31 mm
Width		11 mm
Depth		20 mm
Cable length		0.4 m

Connection



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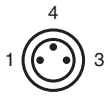
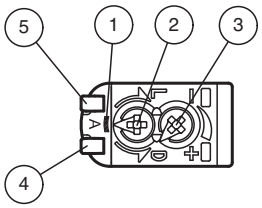
Connection Assignment



Wire colors in accordance with EN 60947-5-2

1	|	BN	(brown)
3	|	BU	(blue)
4	|	BK	(black)

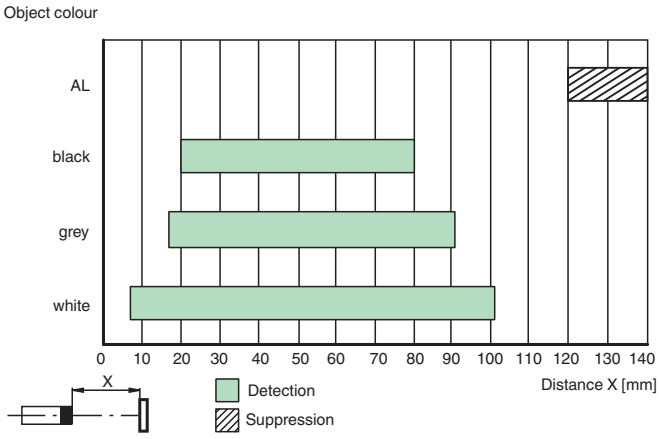
Assembly



1	Alignment Mode	
2	Light-Dark-switching	
3	Sensitivity adjuster	
4	Signal display	yellow
5	Operating display	green

Characteristic Curve

Detection ranges



Configuration

Setting mode (A-Mode):

A-Mode is an additional switch position that is integrated into the light-on/dark-on changeover switch. A-Mode is located between position L and position D. A-Mode is a help mode which enables you to detect whether all 3 light spots are directed onto the object.

If A-Mode is selected, the yellow signal indicator LED flashes; the number of times that the LED flashes equates to the number of detected light spots.

The following scenarios exist:

- No flashing/LED off: No light spots detected
- Fast flashing (8 Hz): 1 light spot detected
- Slow flashing (4 Hz): 2 light spots detected
- Static illumination/LED on: 3 light spots detected

As soon as you exit A-Mode, the yellow LEDs light up in the standard manner again.

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