



**Model Number**

**ML100-8-H-100/95/120/162**

Background suppression sensor with 4-pin, M8 x 1 connector

**Features**

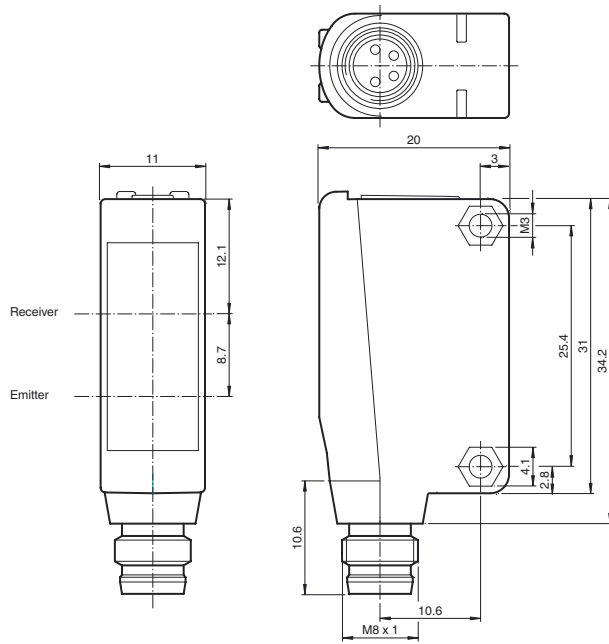
- Diffuse mode sensor with multiple light spots
- Specially designed for detecting critical objects such as PCBs
- Miniature design
- Detects objects in front of a close background through precise background suppression
- Can be adapted to the application in question thanks to the adjustable detection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

**Product information**

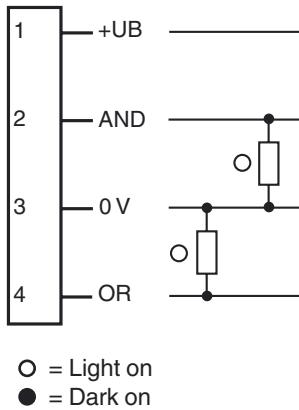
The ML100 series is characterized by its miniature housing with integral, all-metal threaded bushings. All versions are equipped with a visible red transmitter LED. This greatly simplifies installation and commissioning. The switching states are easily visible from all directions thanks to the highly visible LEDs.

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**Dimensions**



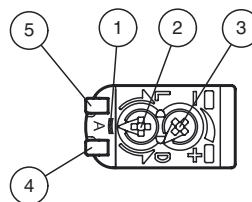
**Electrical connection**



**Pinout**



**Indicators/operating means**



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

**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
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 (outer spot to outer spot)
Optical face	frontal
Ambient light limit	EN 60947-5-2

**Functional safety related parameters**

MTTF <sub>d</sub>	1100 a
Mission Time (T <sub>M</sub> )	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	Detection range adjuster
Control elements	Light/Dark switch

**Electrical specifications**

Operating voltage	U <sub>B</sub>	10 ... 30 V DC, class 2
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	< 15 mA

**Output**

Switching type	light on	
Signal output	2 PNP outputs, independent short-circuit protected, reverse polarity protected, open collector transistor	
Switching voltage	max. 30 V DC	
Switching current	max. 100 mA, resistive load	
Voltage drop	U <sub>d</sub>	≤ 1.5 V DC
Switching frequency	f	500 Hz
Response time		1 ms

**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	connector M8 x 1, 4-pin
Material	
Housing	PC (glass-fiber-reinforced Makrolon)
Optical face	PMMA
Mass	approx. 10 g

**Compliance with standards and directives**

Directive conformity	
EMC Directive 2004/108/EC	EN 60947-5-2
Standard conformity	
Standards	UL 508

**Approvals and certificates**

UL approval	cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval	CCC approval / marking not required for products rated ≤36 V
Approvals	CE, cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure)

**Accessories**

**OMH-ML100-01**  
Mounting bracket

**OMH-ML100-03**  
Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

**OMH-ML100-04**  
Mounting bracket

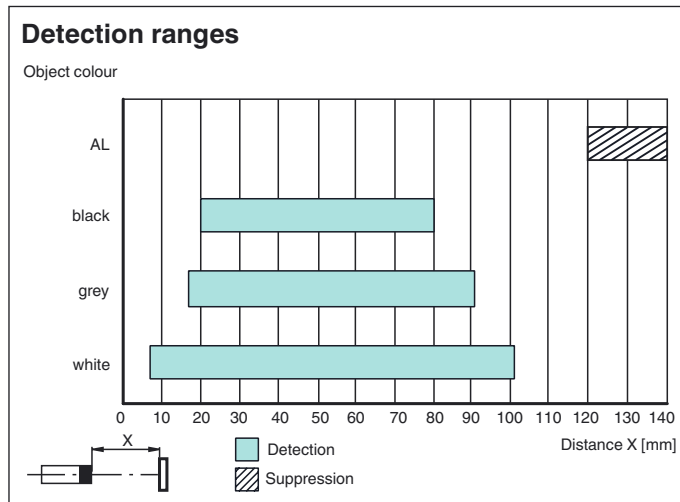
**OMH-ML100-05**  
Mounting bracket

**V31-GM-2M-PUR**  
Female cordset, M8, 4-pin, PUR cable

**V31-WM-2M-PUR**  
Female cordset, M8, 4-pin, PUR cable

**OMH-ML100-08**  
Mounting aid

Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)



## Configuration Information

### Setting mode (A-Mode):

A-Mode is an additional switch position that is integrated into the light ON/dark ON switch. A-Mode is located between position L and position D. A-Mode is a help mode which enables you to detect whether all three 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): One light spot detected
- Slow flashing (4 Hz): Two light spots detected
- Static illumination/LED on: Three light spots detected

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

## Switching output AND and OR

The sensor has three light spots, which the sensor evaluates individually. This permits a logical linking of the light spots.

The logical linking of the light spots is available at the switching output as OR (Pin 4/BK) and AND (Pin 2/WH).

Switching outputs:

If at least one of the three light spots provides an adequate receiving light strength from the detected object, the switching output switches to OR.

If all the light spots provide an adequate receiving light strength from the detected object, the switching output switches to AND.

Logical Linking	1. Light spot	2. Light spot	3. Light spot	Switching output
OR	0	0	0	0
	1	0	0	1
	0	1	0	1
	0	0	1	1
	1	1	0	1
	0	1	1	1
	1	1	1	1
AND	0	0	0	0
	1	0	0	0
	0	1	0	0
	0	0	1	0
	1	1	0	0
	0	1	1	0
	1	1	1	1