Model Number

ML100-54-F/25/103/115a/154-1.5

Retroreflective sensor

with 1500 mm fixed cable and 4-pin, M8 x 1 connector

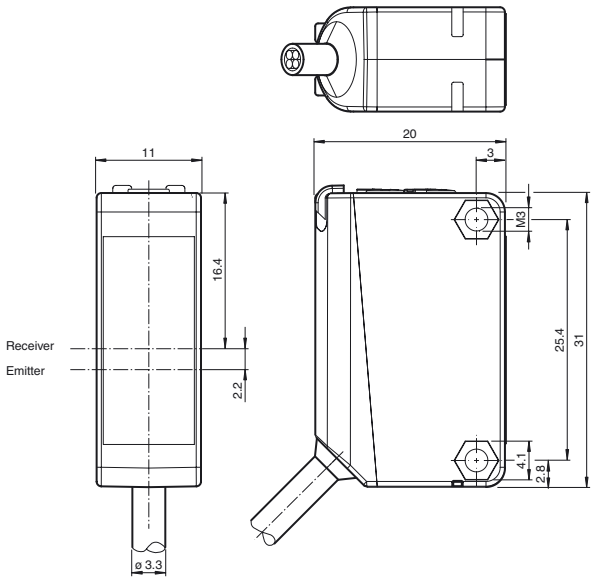
Features

- No controls
- Miniature design
- Easy to use
- Clearly visible LEDs for Power ON, switching state and weak signal indication
- Very bright, highly visible light spot
- Full metal thread mounting
- Not sensitive to ambient light

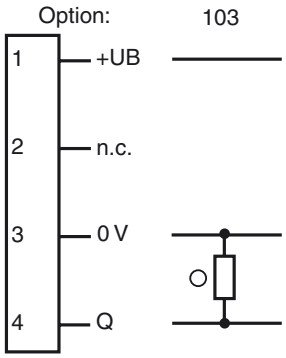
Product information

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.

Dimensions



Electrical connection



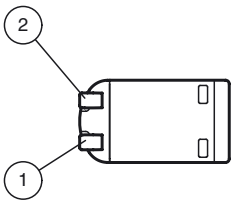
○ = Light on
● = Dark on

Pinout

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Indicators/operating means



1	Signal display	yellow
2	Operating display	green

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Technical data

General specifications		
Effective detection range		0 ... 2.7 m
Reflector distance		0.02 ... 2.7 m
Threshold detection range		3 m
Reference target		H50 reflector
Light source		LED
Light type		modulated visible red light
Polarization filter		yes
Diameter of the light spot		approx. 200 mm at a distance of 3 m
Angle of divergence		approx. 4 °
Optical face		frontal
Ambient light limit		EN 60947-5-2
Functional safety related parameters		
$MTTF_d$		860 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 up when receiving the light beam ; flashes when falling short of the stability control; OFF when light beam is interrupted
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I_0	< 20 mA
Output		
Switching type		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	1000 Hz
Response time		0.5 ms
Conformity		
Product standard		EN 60947-5-2
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Housing width		11 mm
Housing height		31 mm
Housing depth		20 mm
Degree of protection		IP67
Connection		1500 mm fixed cable with 4-pin, M8 x 1 connector
Material		
Housing		PC (Polycarbonate)
Optical face		PMMA
Mass		approx. 50 g
Tightening torque, fastening screws		0.6 Nm
Cable length		1.5 m

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

Accessories

OMH-ML100-09
Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

OMH-F10-ML100
Mounting aid for ML100 series

OMH-ML100-01
Mounting aid for ML100 series, mounting bracket

OMH-ML100-02
Mounting aid for ML100 series, mounting bracket

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

OMH-ML100-04
Mounting aid for ML100 series, mounting bracket

OMH-ML100-05
Mounting aid for ML100 series, mounting bracket

OMH-10
Mounting aid

REF-H85-2
Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes

REF-C110-2
Reflector, round ø 84 mm, central mounting hole

REF-H60-2
Reflector with mounting holes

REF-H50
Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap

REF-H33
Reflector with screw fixing

OFR-70-2
Reflective tape 70 mm x 70 mm

OMH-ML100-08
Mounting aid for ML100 series, Snap-in

Other suitable accessories can be found at www.pepperl-fuchs.com

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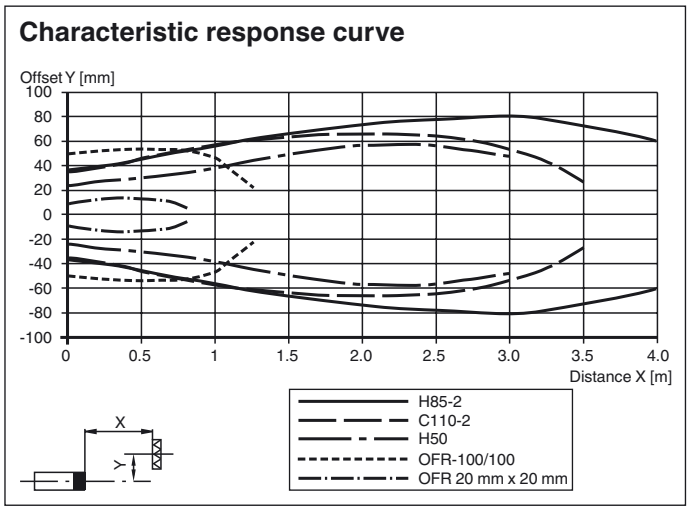
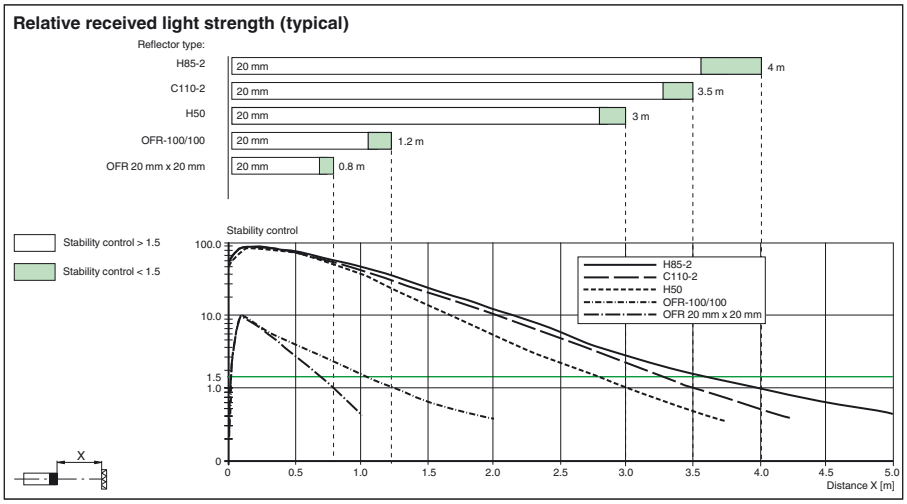
Curves/Diagrams





System Description

The retro-reflective sensor contains both an emitter and a receiver in a single housing. A reflector reflects the light from emitter back to the receiver. If an object interrupts the light beam, the switching function is initiated.

Mounting

The sensors can be mounted directly via through-holes or by using a mounting bracket or a clamp component. Mounting brackets and clamp components are available as accessories.
Ensure that the surface is flat to avoid housing distortion during mounting and fixing.
Secure nut and bolt with spring washers to prevent misalignment of the sensor.

Adjusting the Sensor: Apply the operating voltage to the sensor. The power indicator lights green.
Mount a suitable reflector opposite the retroreflecitve sensor. Align the sensor (without object) roughly with the reflector. Then adjust the sensor to the reflector by tilting it horizontally and vertically until the yellow signal indicator is permanently lights up. If the alignment is inaccurate, the yellow signal indicator flashes.

Commissioning

Check Object Detection: Check as follows if the sensor detects objects as intended.
Position the object in the beam path of the sensor.
Once the object is detected, the yellow signal indicator goes out. As soon as the object leaves the beam path of the sensor, the yellow signal indicator permanently lights up again.

Maintenance

Cleaning: If reception deteriorates, e. g. due to dirt, the yellow signal indicator of the receiver flashes. Clean the optical interfaces of the sensor (e. g. lenses) at regular intervals.
Servicing: Check the mounting screw connections and the electrical plug connections regularly.

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