Model Number
ML4.2-54-F/40b/95/110
Retroreflective sensor with 4-pin, M8 x 1 connector

Features
- High-precision sensors for complex applications
- Miniature design with very robust and versatile mounting options
- Optical surface made of scratch-resistant glass for areas that are prone to high levels of dirt
- Objects can be reliably detected down to 0 mm: no blind zone
- Small, sharp light spot
- Tamper-proof version with no adjustments

Product information
The ML4.2 series is characterized by a robust, powerful and standard design in a miniature housing. The housing offers IP67/ IP69K degree of protection, a scratch- and chemical-resistant lens, highly visible LEDs and robust all-metal bushings for mounting. Adjustable and tamper-proof sensors are available with a universal push-pull output and an electrical light ON/dark ON switch. The sensors have a high ambient light limit. Reflections from the background are suppressed. The unusually small, sharp light spot and the quick response time offer maximum switching precision on object edges. Both red and infrared light sources are available. A high-performance fixed focus background suppressor is a useful feature. The sensors are suitable for precise object detection and open up a wide range of application fields.
Retroreflective sensor with polarization filter

ML4.2-54-F/40b/95/110

Technical data

General specifications
- Effective detection range: 0 ... 5 m
- Reflector distance: 0 ... 5 m
- Threshold detection range: 6 m
- Reference target: H85-2 reflector
- Light source: LED
- Light type: modulated visible red light, 660 nm
- Polarization filter: yes
- Angle deviation: max. ± 1°
- Diameter of the light spot: approx. 40 mm at detection range 1 m
- Angle of divergence: 1.7°
- Ambient light limit:
  - Continuous light: 40000 Lux
  - Modulated light: 5000 Lux

Functional safety related parameters
- MTTFd: 1940 a
- Mission Time (TM): 20 a
- Diagnostic Coverage (DC): 0 %

Indicators/operating means
- Operation indicator: LED green, statically lit Power on, Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz), short-circuit: LED green flashing (approx. 4 Hz)
- Function indicator: LED yellow: switching state, Stability control

Electrical specifications
- Operating voltage: \( U_B \) 10 ... 30 V DC
- Ripple: max. 10 %
- No-load supply current: \( I_0 \) < 20 mA at 24 V DC

Output
- Switching type: light/dark on electrically switchable
- Signal output: 1 push-pull (4 in 1) output, short-circuit-protected, reverse polarity protected
- Switching voltage: max. 30 V DC
- Switching current: max. 100 mA
- Voltage drop: \( U_d \) ≤ 2.5 V DC
- Switching frequency: \( f \) 1 kHz
- Response time: 500 μs

Ambient conditions
- Ambient temperature: -20 ... 60 °C (-4 ... 140 °F)
- Storage temperature: -20 ... 75 °C (-4 ... 167 °F)

Mechanical specifications
- Degree of protection: IP67 / IP69K
- Connection: M8 x 1 connector, 4-pin
- Material:
  - Housing: ABS
  - Optical face: glass pane
- Mass: approx. 10 g

Compliance with standards and directives
- Standard conformity:
  - IEC 60947-5-2:2007
- Shock and impact resistance: IEC / EN 60068, half-sine, 40 g in each X, Y and Z directions
- Vibration resistance: IEC / EN 60068-2-6. Sinus. 10 -2000 Hz, 10 g in each X, Y and Z directions

Approvals and certificates
- CE conformity: yes
- EAC conformity: TR CU 020/2011
- UL approval: cULus Listed
- CCC approval: CCC approval / marking not required for products rated ≤36 V

Accessories
- OMH-4.1
  - Mounting Clamp
- OMH-ML6
  - Mounting bracket
- OMH-ML6-Z
  - Mounting bracket
- OMH-ML6-U
  - Mounting bracket
- OMH-11-02 Aperture-V-H 0.5 mm
  - Slit diaphragm can be affixed for detecting very small parts
- OMH-11-04 Aperture-V-H 1.0 mm
  - Slit diaphragm can be affixed for detecting very small parts
- OMH-11-06 Aperture-V-H 1.5 mm
  - Slit diaphragm can be affixed for detecting very small parts
- OMH-11-08 Aperture-V-H 2.0 mm
  - Slit diaphragm can be affixed for detecting very small parts
- V31-GM-2M-PVC
  - Female cordset, M8, 4-pin, PVC cable
- V31-WM-2M-PVC
  - Female cordset, M8, 4-pin, PVC cable
- 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
  - Reflector, rectangular 40.5 mm x 60 mm, mounting holes
- REF-VR10
  - Reflector, rectangular 60 mm x 19 mm, mounting holes
- OFR-100/100
  - Reflective tape 100 mm x 100 mm
- REF-A17
  - Reflector, round ø 20.5 mm, self-adhesive

Other suitable accessories can be found at www.pepperl-fuchs.com
Retroreflective sensor with polarization filter ML4.2-54-F/40b/95/110

### Curves/Diagrams

#### Characteristic response curve

![Characteristic response curve diagram](image1)

- Offset Y [mm]
- Distance X [m]
- H85-2
- C110-2
- H60
- VR10
- OFR100/100

#### Relative received light strength

![Relative received light strength diagram](image2)

- Reflector types: H85-2, C110-2, H60, VR10, OFR100/100
- Distance X [m]
- Stability control > 2
- Stability control < 2

#### Light spot diameter

![Light spot diameter diagram](image3)

- Diameter in mm
- Distance in m
- H85-2
- C110-2
- H60
- VR10
- OFR100/100
- A17