Model Number
ML9-54-G/25/136/143
Retroreflective sensor with 4-pin, M8 x 1 connector

Features
• Ultra bright LEDs for power on, pre-fault indication and switching state
• Flashing power on LED in case of short-circuit
• TEACH-IN
• Automatic adjustment in case of soiling in contrast detection mode
• Not sensitive to ambient light, even with switched energy saving lamps
• Protected against mutual interference (no cross-talk)
• Protection class II

Electrical connection
Option:
1. +UB
2. ○
3. 0 V
4. Q

Indicators/operating means
1. LED green
2. LED yellow
3. Teach-In
## Technical data

### General specifications
- **Effective detection range**: 0 ... 3.5 m in TEACH mode  
  0 ... 5.7 m in normal mode  
- **Reflector distance**: 0 ... 3.5 m in TEACH mode  
  0 ... 5.7 mm in normal mode  
- **Threshold detection range**: 7.6 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**: 40000 Lux

### Functional safety related parameters
- **MTTFd**: 1050 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; Teach-In  
- **Control elements**: Teach-In key  
- **Contrast detection levels**: 10 % - clean, water filled PET bottles

### Electrical specifications
- **Operating voltage**: $U_B$  
  10 ... 30 V DC, class 2  
- **Ripple**: max. 10 %  
- **No-load supply current**: $I_0$ < 20 mA at 24 V DC

### Output
- **Switching type**: light on  
- **Signal output**: 2 push-pull (4 in 1) outputs, complementary, short-circuit proof, reverse polarity protected  
- **Switching voltage**: max. 30 V DC  
- **Switching current**: max. 100 mA  
- **Switching frequency**: f 1000 Hz  
- **Response time**: 500 µs

### Ambient conditions
- **Ambient temperature**: -20 ... 60 °C (-4 ... 140 °F)  
- **Storage temperature**: -40 ... 75 °C (-40 ... 167 °F)

### Mechanical specifications
- **Degree of protection**: IP67  
- **Connection**: M8 x 1 connector, 4-pin  
- **Material**
  - Housing: PC (glass-fiber-reinforced Makrolon)  
  - Optical face: glass  
  - Connector: plastic  
- **Mass**: approx. 25 g

### Compliance with standards and directives
- **Standard conformity**
  - IEC 60947-5-2:2007  
- **Standards**: EN 50178, UL 508

### Approvals and certificates
- **Protection class**: II, rated voltage ≤ 50 V AC with pollution degree 1-2 according to IEC 60664-1 functional insulation acc. to DIN EN 50178
- **UL approval**: cULus  
- **CCC approval**: CCC approval / marking not required for products rated ≤36 V

---

### Accessories
- **OMH-ML9**
  - Mounting bracket
- **OMH-ML9-01**
  - Threaded bolt M3
- **V31-GM-2M-PVC**
  - Female cordset, M8, 4-pin, PVC cable
- **V31-WM-2M-PVC**
  - Female cordset, M8, 4-pin, PVC cable
- **V31-GM-5M-PUR**
  - Female cordset, M8, 4-pin, PUR cable
- **V31-WM-5M-PUR**
  - Female cordset, M8, 4-pin, PUR cable

Other suitable accessories can be found at www.pepperl-fuchs.com
Adjustment instructions for devices with Teach-In

After the operating voltage has been applied, the LED is lit green. The sensor is automatically set to a state of maximum sensitivity (state as supplied) or the state of the most recent Teach-In setting.

Assemble the appropriate reflector opposite the light barrier.

Teach-In using the Teach key
- Align the sensor to an appropriate reflector.
- Press the Teach key - as confirmation, the green display LED is briefly turned off once.
Retroreflective sensor with polarization filter for clear object ML9-54-G/25/136/143

- Hold the Teach key down until the yellow and green display LED is flashing at regular intervals (about 2.5 Hz). Then release the Teach key.
- During the internal set-up of the sensor, the green and yellow display LEDs flash alternately (about 2.5 Hz).
- Teach-In successful: The green and yellow display LEDs are lit. Contrast detection 10% is activated. The device is ready for operation.
- Teach-In not successful: The green and yellow display LEDs flash alternately and rapidly (about 8 Hz) for about 5 seconds. Then the sensor goes to the state with maximum sensitivity. After this happens, repeat the Teach-In procedure, starting with step 1.