



MLP1-SMMFOAC

MLP1

SAFETY LOCKING DEVICES

SICK
Sensor Intelligence.



Ordering information

| Type | part no. |
|--------------|----------|
| MLP1-SMMFOAC | 1080321 |

Other models and accessories → www.sick.com/MLP1



Detailed technical data

Features

| | |
|--|-------------------|
| Sensor principle | RFID |
| Locking principle | Power to lock |
| Coding | Universally coded |
| Locking force F_{max} | 550 N (GS-ET-19) |
| Locking force F_{Zh} | 500 N (GS-ET-19) |
| Retaining force | 25 N |
| Offset tolerance | ≤ 5 mm |
| Assured switch off distance S_{ar} | 45 mm |
| For process protection only | ✓ |

Safety-related parameters

| | |
|---|--|
| Safety integrity level | SIL 3 (IEC 61508) |
| Category | Category 4 (EN ISO 13849) |
| Performance level | PL e (EN ISO 13849) ¹⁾ |
| PFH_D (mean probability of a dangerous failure per hour) | $15 * 10^{-9}$ ²⁾ |
| T_M (mission time) | 20 years (EN ISO 13849) |
| Type | Type 4 (EN ISO 14119) |
| Actuator coding level | Low coding level (EN ISO 14119) |
| Safe state in the event of a fault | At least one safety-related semiconductor output (OSSD) is in the OFF state. |

¹⁾ In a safe series connection, the performance level for the safe series connection as a whole depends on the number and type of devices in the safe series connection. PL e is only possible in safe series connections with a maximum of 6 devices.

²⁾ At 40 °C and 1000 m above sea level.

Functions

| | |
|--|---------------------|
| Switching behavior of the OSSDs | Actuator monitoring |
|--|---------------------|

| | |
|-------------------------------|--|
| Safe series connection | With T-connector (without diagnostics) With Flexi Loop (with diagnostics) |
|-------------------------------|--|

Interfaces

| | |
|---------------------------------------|------------------------------|
| Connection type | Cable with plug M12, 8-pin |
| Length of cable | 150 mm |
| Long connecting cable | ≤ 100 m |
| Cable diameter | 5.5 mm |
| Conductor cross section | 0.12 mm ² |
| Bend radius (with fixed installation) | > 8 x cable diameter |
| Bend radius (with moving cable) | > 12 x cable diameter |
| Cable material | PVC |
| Conductor material | Copper |
| Coupling nut material | Zinc die-cast, nickel-plated |
| Display elements | LEDs |
| Status display | ✓ |

Electronics

| | |
|---|---|
| Protection class | III (IEC 61140) |
| Contamination rating | 3 (EN 60947-1) |
| Classification according to cULus | Class 2 |
| Usage category | DC-13 (IEC 60947-5-1) |
| Rated insulation voltage U_i | 32 V |
| Rated impulse withstand voltage U_{imp} | 1,500 V |
| Supply voltage U_v when an individual safety switch is connected | |
| Sensor | 24 V DC (19.2 V DC ... 28.8 V DC) |
| Magnet | 24 V DC (19.2 V DC ... 28.8 V DC) |
| Supply voltage U_v when a cascade is connected | |
| Sensor | 24 V DC (22.8 V DC ... 28.8 V DC) |
| Magnet | 24 V DC (21.6 V DC ... 28.8 V DC) |
| Power consumption | |
| Locking active | 350 mA |
| Locking deactivated | 50 mA |
| Switching frequency | ≤ 0.5 Hz |
| Type of output | Self-monitoring semiconductor outputs (OSSDs) |
| Output current (OSSDs) | ≤ 100 mA |
| Diagnostic output | ≤ 25 mA, short-circuit protected |
| Cable capacitance | 400 nF (for OUT A and OUT B) |
| Response time | 50 ms ¹⁾ |
| Release time | 100 ms ¹⁾ |
| Risk time | 100 ms ¹⁾ |

¹⁾ In a cascade, the value is multiplied by the number of safety switches in the cascade.

| | |
|--------------------------|---------------|
| Switch-on time | 2.5 s |
| Locking principle | Power to lock |

¹⁾ In a cascade, the value is multiplied by the number of safety switches in the cascade.

Mechanics

| | | |
|-------------------------------|------------------------|----------------------------|
| Weight | Switches (spare parts) | 510 g |
| | Actuator | 210 g |
| Material | Sensor housing | Anodized aluminum |
| | Actuator housing | Fiber-glass-reinforced PVC |
| | Anchor plate | Nickel-plated steel |
| Dimensions (W x H x D) | Switches (spare parts) | 120 mm x 60 mm x 38.5 mm |
| | Actuator | 120 mm x 60 mm x 20.5 mm |
| Offset tolerance | Vertical | ≤ 5 mm |
| | Horizontal | ≤ 5 mm |
| | Aperture angle | ≤ 3° |

Ambient data

| | |
|--------------------------------------|--|
| Enclosure rating | IP67 (EN 60529) |
| Ambient operating temperature | -20 °C ... +55 °C |
| Storage temperature | -25 °C ... +70 °C |
| Relative humidity | 50 %, at 70 °C (IEC 60947-5-2) |
| Vibration resistance | 10 Hz ... 55 Hz, 1 mm (IEC 60068-2-6) |
| Shock resistance | 30 g, 11 ms (EN 60068-2-27) |
| EMC | EN IEC 61326-3-1 EN IEC 60947-5-2 EN IEC 60947-5-3 |

Certificates

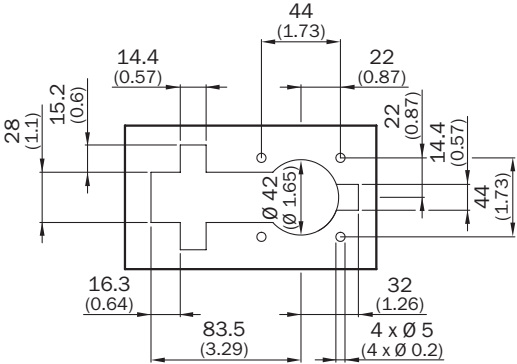
| | |
|---------------------------------------|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| China RoHS | ✓ |
| UK-Type-Examination approval | ✓ |
| cULus certificate | ✓ |
| FCC certificate | ✓ |
| TÜV approval | ✓ |
| TÜV approval annex | ✓ |
| EC-Type-Examination approval | ✓ |

Classifications

| | |
|-------------------|----------|
| ECLASS 5.0 | 27272603 |
|-------------------|----------|

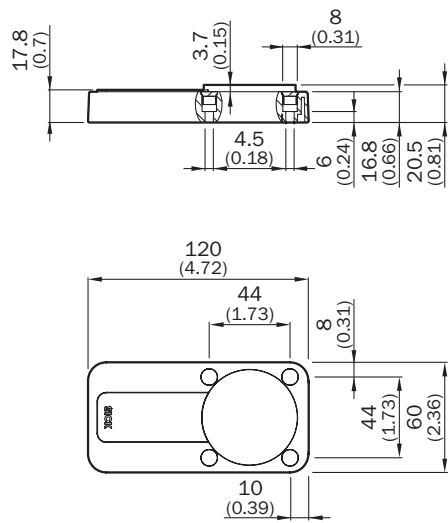
| | |
|-----------------------|----------|
| ECLASS 5.1.4 | 27272603 |
| ECLASS 6.0 | 27272603 |
| ECLASS 6.2 | 27272603 |
| ECLASS 7.0 | 27272603 |
| ECLASS 8.0 | 27272603 |
| ECLASS 8.1 | 27272603 |
| ECLASS 9.0 | 27272603 |
| ECLASS 10.0 | 27272603 |
| ECLASS 11.0 | 27272603 |
| ECLASS 12.0 | 27272603 |
| ETIM 5.0 | EC002593 |
| ETIM 6.0 | EC002593 |
| ETIM 7.0 | EC002593 |
| ETIM 8.0 | EC002593 |
| UNSPSC 16.0901 | 39122205 |

Dimensional drawing Recess for flush mounting



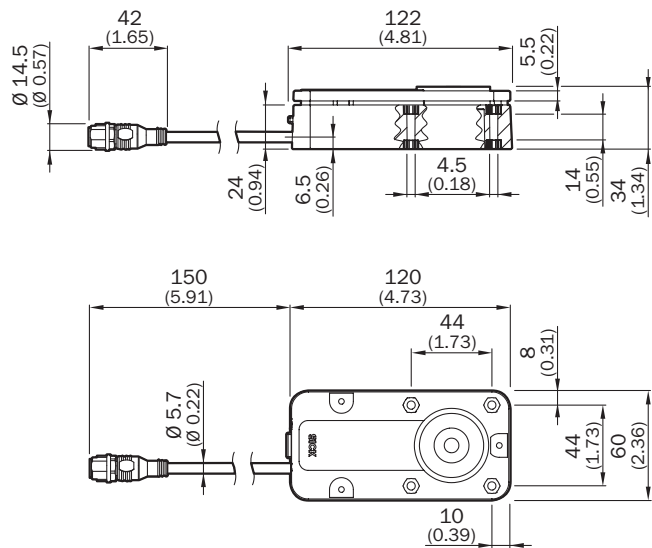
Dimensions in mm (inch)

Dimensional drawing Actuator



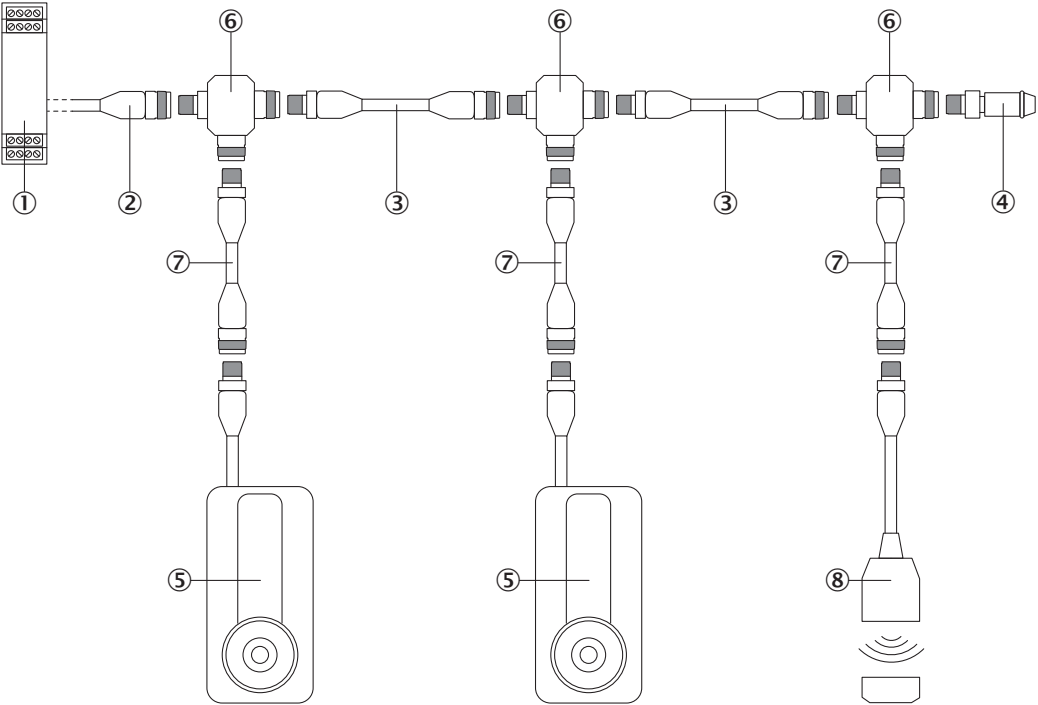
Dimensions in mm (inch)

Dimensional drawing Sensor with M12 male connector



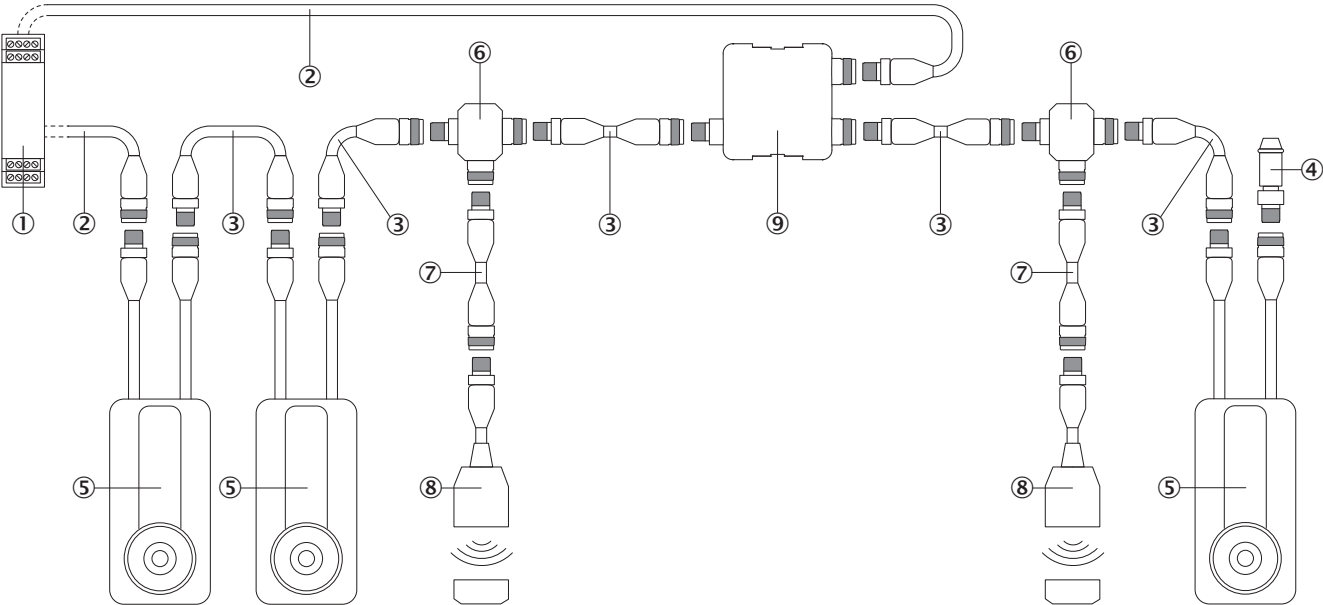
Dimensions in mm (inch)

Series connection Connecting safety switches connected with T-connectors



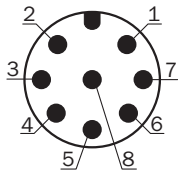
- ① Safe evaluation unit
- ② connecting cable with M12 female connector, 5-pin and flying leads (e.g., YF2A15-xxxVB5XLEAX)
- ③ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female connector (e.g., YF2A15-xxxUB5M2A15)
- ④ End plug
- ⑤ MLP1 safety switch (M12, 8-pin)
- ⑥ T-piece
- ⑦ Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
- ⑧ other safety switch, M12, 8-pin (e.g. TR4, STR1, TR10 Lock)

Series connection Combining connection methods as desired



- ① Safe evaluation unit
- ② connecting cable with M12 female connector, 5-pin and flying leads (e.g., YF2A15-xxxVB5XLEAX)
- ③ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female connector (e.g., YF2A15-xxxUB5M2A15)
- ④ End plug
- ⑤ MLP1 safety switch
- ⑥ T-piece
- ⑦ Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
- ⑧ Safety switch, M12, 8-pin
- ⑨ Nodes for voltage supply

Pinouts







| Pin | Designation | Description |
|-----|-------------------|------------------------------|
| 1 | Service interface | Diagnostic output |
| 2 | +24 V DC | Safety switch voltage supply |
| 3 | Magnet | Magnet control 24 V DC |
| 4 | In 2 | OSSD 2 input* |
| 5 | OSSD 1 | OSSD 1 output |
| 6 | OSSD 2 | OSSD 2 output |
| 7 | 0 V | 0 V DC voltage supply |
| 8 | In 1 | OSSD 1* input |

*When used as an individual safety switch or as the first safety switch in a cascade: Apply 24 V DC.

For details see operating instructions

Recommended accessories

Other models and accessories → www.sick.com/MLP1

| | Brief description | Type | part no. |
|---|---|--------------------|----------|
| connectors and cables | | | |
|  | <ul style="list-style-type: none"> Description: Sensor/actuator cable, unshielded Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 2 m, 8-wire, PUR, halogen-free Application: Drag chain operation, Zones with oils and lubricants, Robot, Drag chain operation | YF2A18-020UA5XLEAX | 2095652 |
|  | <ul style="list-style-type: none"> Description: Sensor/actuator cable, unshielded Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 8-wire, PUR, halogen-free Application: Drag chain operation, Zones with oils and lubricants, Robot, Drag chain operation | YF2A18-050UA5XLEAX | 2095653 |
|  | <ul style="list-style-type: none"> Description: Sensor/actuator cable, unshielded Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 10 m, 8-wire, PUR, halogen-free Application: Drag chain operation, Zones with oils and lubricants, Robot, Drag chain operation | YF2A18-100UA5XLEAX | 2095654 |
| Safety relays | | | |
|  | <ul style="list-style-type: none"> Applications: Evaluation unit Compatible sensor types: Safety sensors with OSSDs Connection type: Front connector with spring terminals Restart interlock: yes External device monitoring (EDM): Integrated Outputs: 2 enabling current paths (safe), 2 application diagnostic outputs (not safe), 1 test pulse output (not safe) Housing width: 18 mm | RLY3-OSSD200 | 1085344 |

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SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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