



# 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](http://www.sick.com/MLP1)



## Detailed technical data

## Features

<b>Sensor principle</b>	Transponder
<b>Locking force</b>	500 N
<b>Retaining force</b>	25 N
<b>Offset tolerance</b>	≤ 5 mm
<b>Safe switch off distance <math>S_{ar}</math></b>	45 mm
<b>For process protection only</b>	✓

## Safety-related parameters

<b>Safety integrity level</b>	SIL3 (IEC 61508), SILCL3 (EN 62061)
<b>Category</b>	Category 4 (EN ISO 13849)
<b>Performance level</b>	PL e (EN ISO 13849) <sup>1)</sup>
<b>PFH<sub>D</sub> (mean probability of a dangerous failure per hour)</b>	$1.5 \times 10^{-8}$ (EN ISO 13849) <sup>2)</sup>
<b>T<sub>M</sub> (mission time)</b>	20 years (EN ISO 13849)
<b>Type</b>	Type 4 (EN ISO 14119)
<b>Actuator coding level</b>	Low coding level (EN ISO 14119)
<b>Safe state in the event of a fault</b>	At least one safety-related semiconductor output (OSSD) is in the OFF state.

<sup>1)</sup> In a cascade, the performance level for the cascade as a whole depends on the number and type of devices in the cascade. PL e is only possible in cascades with a maximum of 6 devices.

<sup>2)</sup> At 40 °C and 1000 m above sea level.

## Functions

<b>Cascading</b>	✓ (cascadable with T-connector or Flexi Loop)
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## Interfaces

<b>Connection type</b>	Cable with plug M12, 8-pin
Flexi-Loop-ready	✓
Length of cable	150 mm

Cable material	PVC
Connecting cable length	≤ 100 m

Electrical data

<b>Protection class</b>	III (IEC 61140)
<b>Contamination rating</b>	3 (EN 60947-1)
<b>Classification according to cULus</b>	Class 2
<b>Usage category</b>	DC-13 (IEC 60947-5-1)
<b>Rated insulation voltage <math>U_i</math></b>	32 V
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	1,500 V
<b>Supply voltage <math>U_V</math> when an individual safety switch is connected</b>	
Sensor	24 V DC (19.2 V DC ... 28.8 V DC)
Magnet	24 V DC (19.2 V DC ... 28.8 V DC)
<b>Supply voltage <math>U_V</math> when a cascade is connected</b>	
Sensor	24 V DC (22.8 V DC ... 28.8 V DC)
Magnet	24 V DC (21.6 V DC ... 28.8 V DC)
<b>Power consumption</b>	
Locking active	350 mA
Locking deactivated	50 mA
<b>Switching frequency</b>	≤ 0.5 Hz
<b>Type of output</b>	Semiconductor (OSSD)
<b>Output current (OSSDs)</b>	≤ 100 mA
<b>Diagnostic output</b>	≤ 25 mA, short-circuit protected
<b>Cable capacitance</b>	400 nF (for OUT A and OUT B)
<b>Response time</b>	50 ms <sup>1)</sup>
<b>Enable time</b>	100 ms <sup>1)</sup>
<b>Risk time</b>	100 ms <sup>1)</sup>
<b>Switch-on time</b>	2.5 s
<b>Locking principle</b>	Power to lock

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

Mechanical data

<b>Weight</b>		
Switches		510 g
Actuator		210 g
<b>Material</b>		
Sensor housing		Anodized aluminum
Actuator housing		Fiber-glass-reinforced PVC
Anchor plate		Nickel-plated steel
<b>Dimensions (W x H x D)</b>		
Switches		120 mm x 60 mm x 38.5 mm

	Actuator	120 mm x 60 mm x 20.5 mm
<b>Offset tolerance</b>	Vertical	≤ 5 mm
	Horizontal	≤ 5 mm
	Aperture angle	≤ 3°

## Ambient data

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

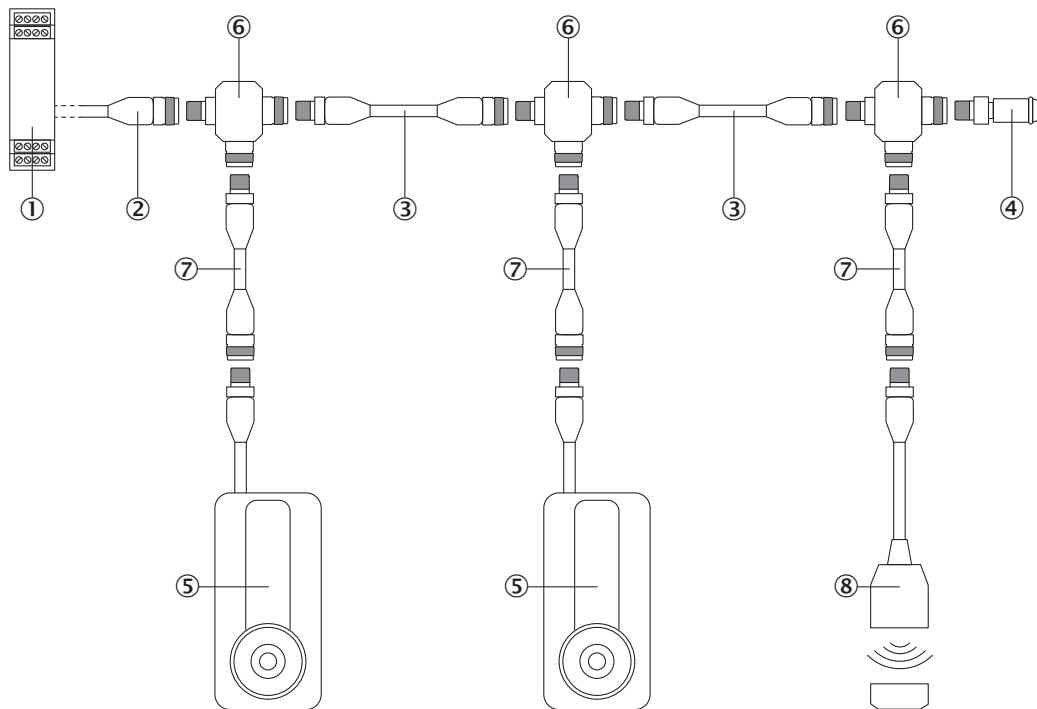
## Classifications

<b>ECl@ss 5.0</b>	27272603
<b>ECl@ss 5.1.4</b>	27272603
<b>ECl@ss 6.0</b>	27272603
<b>ECl@ss 6.2</b>	27272603
<b>ECl@ss 7.0</b>	27272603
<b>ECl@ss 8.0</b>	27272603
<b>ECl@ss 8.1</b>	27272603
<b>ECl@ss 9.0</b>	27272603
<b>ETIM 5.0</b>	EC002593
<b>ETIM 6.0</b>	EC002593
<b>UNSPSC 16.0901</b>	39122205



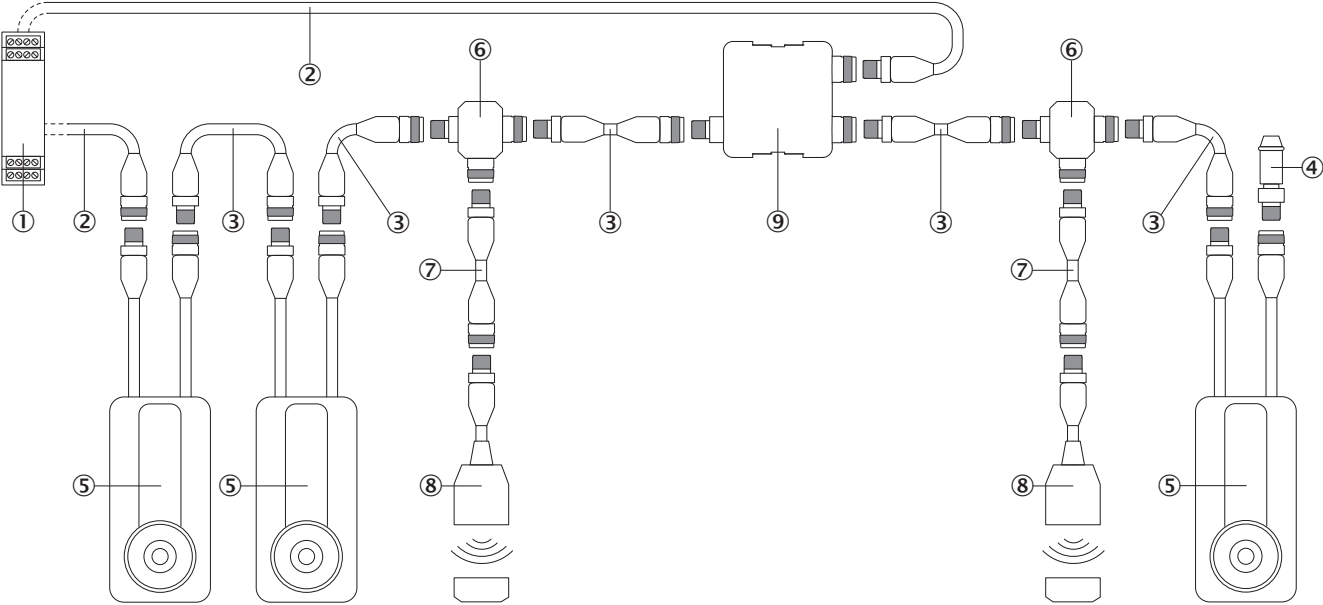
### Series connection

Connecting safety switches connected with T-connectors



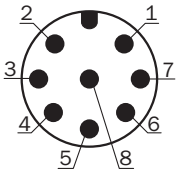
- ① Safe evaluation unit
- ② Connecting cable with 5-pin, M12 female connector and flying leads (e.g., YF2A15-xxxVB5XLEAX)
- ③ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female with connector (e.g., YF2A15-xxxUB5M2A15)
- ④ End plug
- ⑤ MLP1 safety switch (M12, 8-pin)
- ⑥ T-piece
- 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)

Combining connection methods as desired



- ① Safe evaluation unit
- ② Connecting cable with 5-pin, M12 female connector 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

**Connection diagram**



Pin	Designation	Description
1	AUX	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

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

### Recommended accessories

Other models and accessories → [www.sick.com/MLP1](http://www.sick.com/MLP1)

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m	YF2A18-020UA5XLEAX	2095652
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2.5 m	YF2A18-025UA5XLEAX	2099229
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m	YF2A18-050UA5XLEAX	2095653
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 7.5 m	YF2A18-075UA5XLEAX	2099230
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m	YF2A18-100UA5XLEAX	2095654
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 15 m	YF2A18-150UA5XLEAX	2095679
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 20 m	YF2A18-200UA5XLEAX	2095680
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 30 m	YF2A18-300UA5XLEAX	2095681



## SICK AT A GLANCE

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.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)