



# TR4-SFM01CB

TR4 Direct

NON-CONTACT SAFETY SWITCHES

**SICK**  
Sensor Intelligence.



## Ordering information

Type	Part no.
TR4-SFM01CB	6070817

Other models and accessories → [www.sick.com/TR4\\_Direct](http://www.sick.com/TR4_Direct)



## Detailed technical data

### Features

<b>System part</b>	Sensor with actuator
<b>Sensor principle</b>	Transponder
<b>Number of safe outputs</b>	2
<b>Safe switch on distance <math>S_{ao}</math></b>	15 mm
<b>Safe switch off distance <math>S_{ar}</math></b>	25 mm
<b>Active sensor surfaces</b>	2
<b>Actuation directions</b>	5
<b>Retaining force</b>	≤ 10 N
<b>Boundary area indication</b>	✓
<b>Coding</b>	Universally coded

### 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)
<b>PFH<sub>D</sub> (mean probability of a dangerous failure per hour)</b>	$6.03 \cdot 10^{-10}$ (EN ISO 13849)
<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>Classification in compliance with IEC/EN 60947-5-3</b>	PDF-M
<b>Safe state in the event of a fault</b>	At least one safety-related semiconductor output (OSSD) is in the OFF state.

### Functions

<b>Safe series connection</b>	With Flexi Loop (with diagnostics) With T-connector (without diagnostics)
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### Interfaces

<b>Connection type</b>	Cable with plug M12, 8-pin
Length of cable	0.2 m

Cable material	PVC
Long connecting cable	≤ 200 m
<b>Status display</b>	✓

#### Electrical data

<b>Protection class</b>	III (EN 50178)
<b>Classification according to cULus</b>	Class 2
<b>Supply voltage V<sub>s</sub></b>	24 V DC (20.4 V DC ... 26.4 V DC)
<b>Power consumption</b>	≤ 50 mA
<b>Type of output</b>	Self-monitoring semiconductor outputs (OSSDs)
<b>Output current</b>	≤ 200 mA
<b>Response time</b>	45 ms <sup>1)</sup>
<b>Enable time</b>	360 ms <sup>2)</sup>
<b>Risk time</b>	≤ 100 ms <sup>3)</sup>
<b>Switch-on time</b>	2 s <sup>4)</sup>
<b>Electrical life</b>	10 x 10 <sup>6</sup> switching cycles

<sup>1)</sup> In a safe series connection, each downstream safety switch increases the system response time. More response times can be found in the operating instructions.

<sup>2)</sup> Response time on approach to the enable zone.

<sup>3)</sup> Detection time for external faults (e.g., short-circuit or cross-circuit of output signal switching devices). Follow the detailed information in the operating instructions.

<sup>4)</sup> After application of the supply voltage to the safety switch.

#### Mechanical data

<b>Design</b>	Rectangular
<b>Dimensions (W x H x D)</b>	25 mm x 88 mm x 20 mm
<b>Weight</b>	112 g
<b>Housing material</b>	Valox® DR48

#### Ambient data

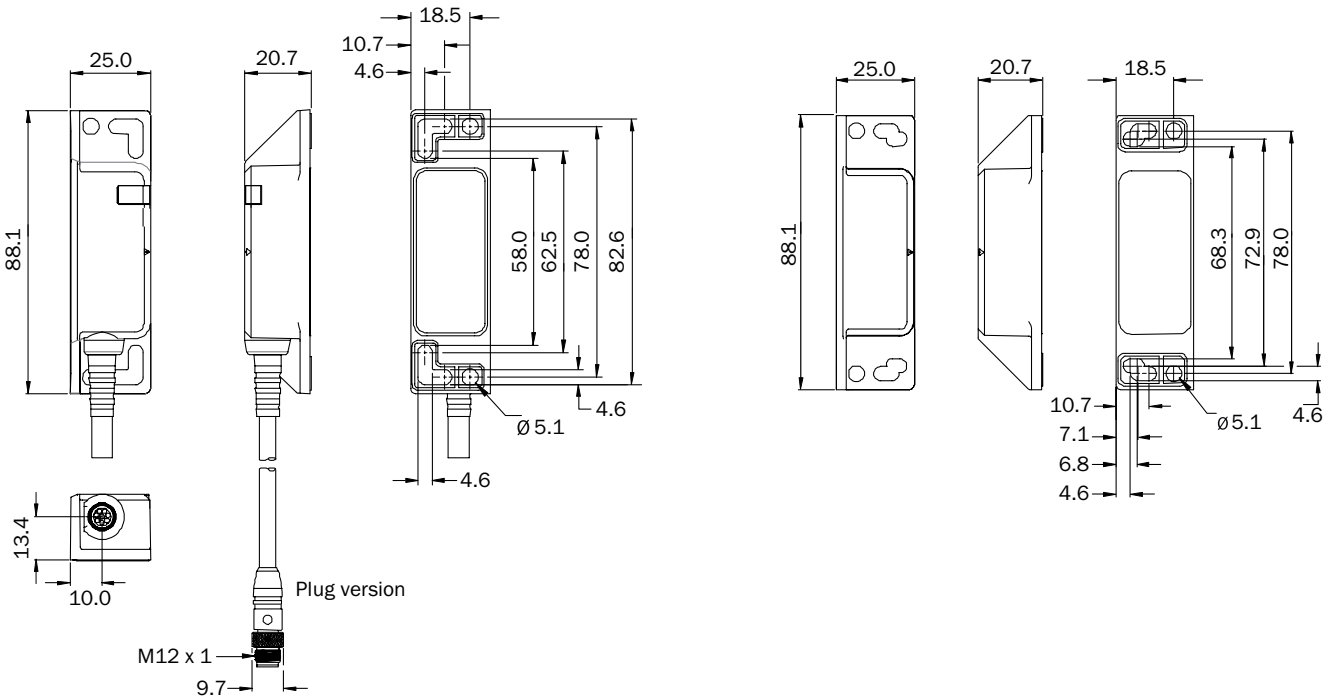
<b>Enclosure rating</b>	IP67 (IEC 60529) IP69K (ISO 20653)
<b>Ambient operating temperature</b>	-25 °C ... +70 °C
<b>Vibration resistance</b>	10 Hz ... 55 Hz, 3.5 mm (IEC 60068-2-6)
<b>Shock resistance</b>	30 g, 11 ms (EN 60068-2-27)

#### Classifications

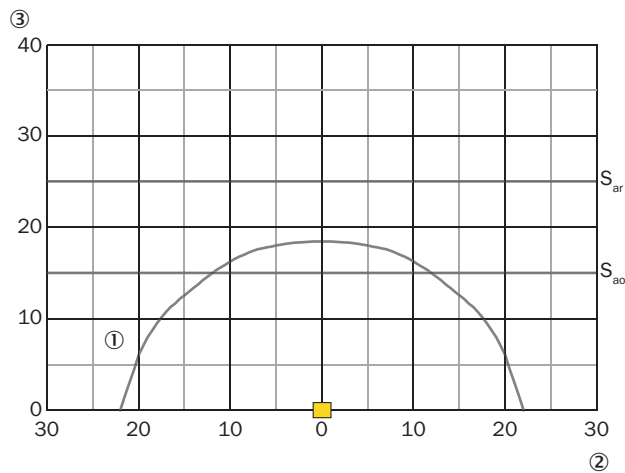
<b>ECI@ss 5.0</b>	27272403
<b>ECI@ss 5.1.4</b>	27272403
<b>ECI@ss 6.0</b>	27272403
<b>ECI@ss 6.2</b>	27272403
<b>ECI@ss 7.0</b>	27272403
<b>ECI@ss 8.0</b>	27272403
<b>ECI@ss 8.1</b>	27272403
<b>ECI@ss 9.0</b>	27272403
<b>ECI@ss 10.0</b>	27272403
<b>ECI@ss 11.0</b>	27272403

ETIM 5.0	EC001829
ETIM 6.0	EC001829
ETIM 7.0	EC001829
ETIM 8.0	EC001829
UNSPSC 16.0901	39122205

Dimensional drawing (Dimensions in mm (inch))

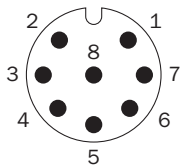


## Response range



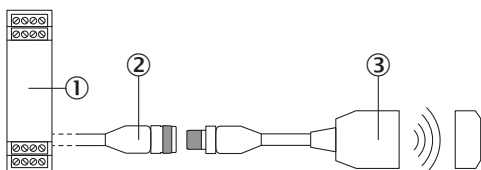
- ① Sensing range
- ② Side deviation in mm
- ③ Distance to sensor surface

## Pin assignment



1	Aux output (not safe)
2	Voltage supply 24 V DC
3	Not connected
4	Enable input for OSSD 2
5	OSSD 1
6	OSSD 2
7	Voltage supply 0 V DC
8	Enable input for OSSD 1

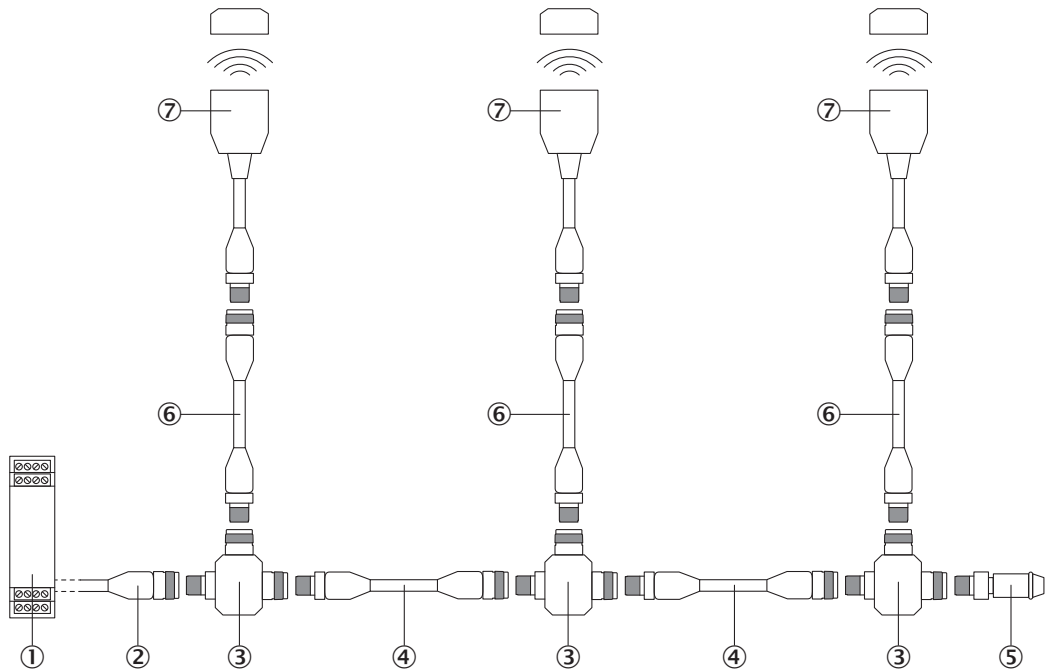
## Connection single sensor



- ① Safe evaluation unit
- ② Connecting cable with M12 female connector, 8-pin and flying leads (e.g. YF2A18-xxxUA5LEAX)
- ③ TR4 Direct transponder safety switch (e.g., TR4-Sxx01C)

## Series connection


Series connection with T-piece (without diagnostics)



- ① Safe evaluation unit
- ② Connecting cable with M12 female connector, 4-pin and flying leads (e.g. YF2A14-xxxVB3XLEAX)
- ③ STR1-XXA T-connector
- ④ Connection cable with 4-pin, M12 male connector and 4-pin, M12 female connector (e.g., YF2A14-xxxVB3M2A14)
- ⑤ MLP1-XXT end connector
- ⑥ Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
- ⑦ TR4 Direct transponder safety switch (e.g., TR4-Sxx01C)

## Recommended accessories

Other models and accessories → [www.sick.com/TR4\\_Direct](http://www.sick.com/TR4_Direct)

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, 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, 10 m	YF2A18-100UA5XLEAX	2095654

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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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