Product data sheet

TR4-SBM02C

TR4 Direct

NON-CONTACT SAFETY SWITCHES

SICK
Sensor Intelligence.

Ordering information

Type	Part no.
TR4-SBM02C	6051948

Other models and accessories ➜ www.sick.com/TR4_Direct

Detailed technical data

Features

System part	Sensor and actuator
Sensor principle	Transponder
Number of safe outputs	2
Safe switch on distance S_{ao}	25 mm
Safe switch off distance S_{ar}	35 mm
Active sensor surfaces	2
Actuation directions	5
Coding	Universally coded

Safety-related parameters

Safety integrity level	SIL3 (IEC 61508), SILCL3 (EN 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFH_D (mean probability of a dangerous failure per hour)	1.119×10^{-9} (EN ISO 13849)
T_M (mission time)	20 years (EN ISO 13849)
Type	Type 4 (EN ISO 14119)
Actuator coding level	Low coding level (EN ISO 14119)
Classification in compliance with IEC/EN 60947-5-3	PDF-M
Safe state in the event of a fault	At least one safety-related semiconductor output (OSSD) is in the OFF state.

Functions

Safe series connection	With Flexi Loop (with diagnostics)

Interfaces

Connection type	Cable with plug M12, 5-pin
Length of cable	0.2 m
Cable material	PVC
Long connecting cable	≤ 200 m
Status display	✓

Electrical data

Protection class	III (EN 50178)
Classification according to cULus	Class 2
Supply voltage V_S	24 V DC (20.4 V DC ... 26.4 V DC)
Power consumption	50 mA
Type of output	Semiconductor (OSSD)
Output current	≤ 200 mA
Response time	60 ms [1)]
Enable time	360 ms [2)]
Risk time	60 s [3)]
Switch-on time	2.5 s [4)]
Electrical life	10 x 10^6 switching cycles

[1)] In a safe series connection, each downstream safety switch increases the system response time. More response times can be found in the operating instructions.
[2)] Response time on approach to the enable zone.
[3)] 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.
[4)] After application of the supply voltage to the safety switch.

Mechanical data

Design	Cylindrical
Housing diameter (sensor/actuator)	M18 / M30
Weight	+ 79 g
Housing material	Valox® DR48

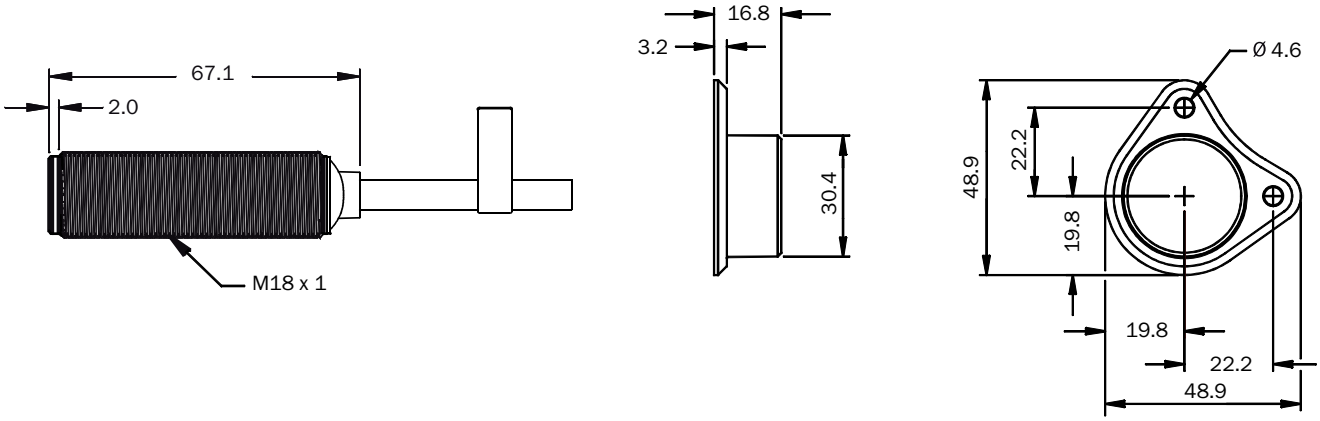
Ambient data

Enclosure rating	IP69K (IEC 60529) NEMA 3 (NEMA 250) NEMA 4X (NEMA 250) NEMA 12 (NEMA 250) NEMA 13 (NEMA 250)
Ambient operating temperature	–10 °C ... +55 °C
Vibration resistance	10 Hz ... 55 Hz, 3.5 mm (IEC 60068-2-6)
Shock resistance	30 g, 11 ms (EN 60068-2-27)

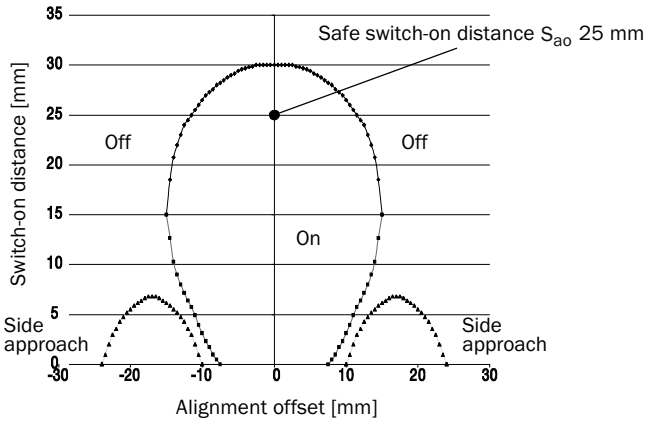
Classifications

ECl@ss 5.0	27272403
ECl@ss 5.1.4	27272403
ECl@ss 6.0	27272403
ECl@ss 6.2	27272403
ECl@ss 7.0	27272403
ECl@ss 8.0	27272403
ECl@ss 8.1	27272403
ECl@ss 9.0	27272403
ETIM 5.0	EC001829
ETIM 6.0	EC001829
UNSPSC 16.0901	39122205

Dimensional drawing (Dimensions in mm (inch))

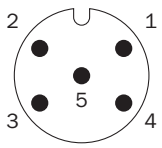


Response range



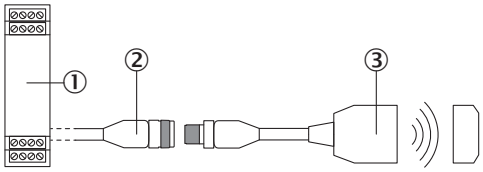
If the actuator moves laterally in relation to the surface of the sensor, a minimum distance of 7 mm must be maintained. This distance will prevent premature triggering due to the side approach areas.

Connection diagram



1	Voltage supply 24 V DC
2	OSSD 1
3	Voltage supply 0 V DC
4	OSSD 2
5	Aux output (not safe)

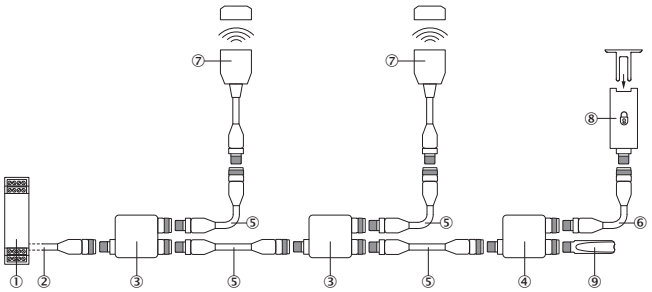
Connection single sensor



① Safe evaluation unit
② Connecting cable with 5-pin, M12 female connector and flying leads (e.g., YF2A15-xxxVB5XLEAX)
③ TR4 Direct transponder safety switch (e.g., TR4-Sxx02C)

Series connection

Series connection with Flexi Loop (with diagnostics)



① Flexi Soft safety controller
② Connecting cable with 5-pin, M12 female connector and flying leads (e.g., YF2A15-xxxVB5XLEAX)
③ FLN-OSSD1000105 Flexi Loop node
④ FLN-EMSS1100108 Flexi Loop node
⑤ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female connector (e.g., YF2A15-xxxUB5M2A15)
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-Sxx02C)
⑧ Safety locking device (e.g., i10-x0454 or i110-x0454)
⑨ FLT-TERM00001 Flexi Loop terminating element

Recommended accessories

Other models and accessories ➜ www.sick.com/TR4_Direct

	Brief description	Type	Part no.
Mounting brackets and plates			
	Mounting bracket for M18 sensors, steel, zinc coated, without mounting hardware	BEF-WN-M18	5308446
Terminal and alignment brackets			
	Clamping block for round sensors M18, without fixed stop, plastic (PA12), glass-fiber reinforced, mounting hardware included	BEF-KH-M18	2051481

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 2 m	YF2A15-020VB5XLEAX	2096239
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 5 m	YF2A15-050VB5XLEAX	2096240
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 10 m	YF2A15-100VB5XLEAX	2096241

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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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