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DATA SHEET

TR4-SEM02CB

TR4 Direct
Non-contact safety switches

SICK Sensor Intelligence



NON-CONTACT SAFETY SWITCHES

TR4-SEM02CB

ORDERING INFORMATION

Type	part no.
TR4-SEM02CB	6070823

Further device versions and accessories at www.sick.com/TR4_Direct

DETAILED TECHNICAL DATA

FEATURES

System part	Sensor with actuator
Sensor principle	RFID
Number of safe outputs	2
Assured switch on distance S_{ao}	15 mm
Assured switch off distance S_{ar}	25 mm
Active sensor surfaces	2
Actuation directions	5
Boundary area indication	✓
Coding	Universally coded

SAFETY-RELATED PARAMETERS

Safety integrity level	SIL 3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFH_D (mean probability of a dangerous failure per hour)	$6.03 * 10^{-10}$
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
Long connecting cable	≤ 200 m
Cable diameter	6.5 mm
Conductor cross section	0.25 mm²
Bend radius (with fixed installation)	> 7 x cable diameter
Bend radius (with moving cable)	> 14 x cable diameter
Cable material	PVC
Conductor material	Copper
Coupling nut material	Nickel-plated brass
Display elements	LEDs
Status display	✓

ELECTRONICS

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	Self-monitoring semiconductor outputs (OSSDs)
Output current	≤ 200 mA
Response time	45 ms [1]
Release time	360 ms [2]
Risk time	≤ 100 ms [3]
Switch-on time	2 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.

MECHANICS

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

AMBIENT DATA

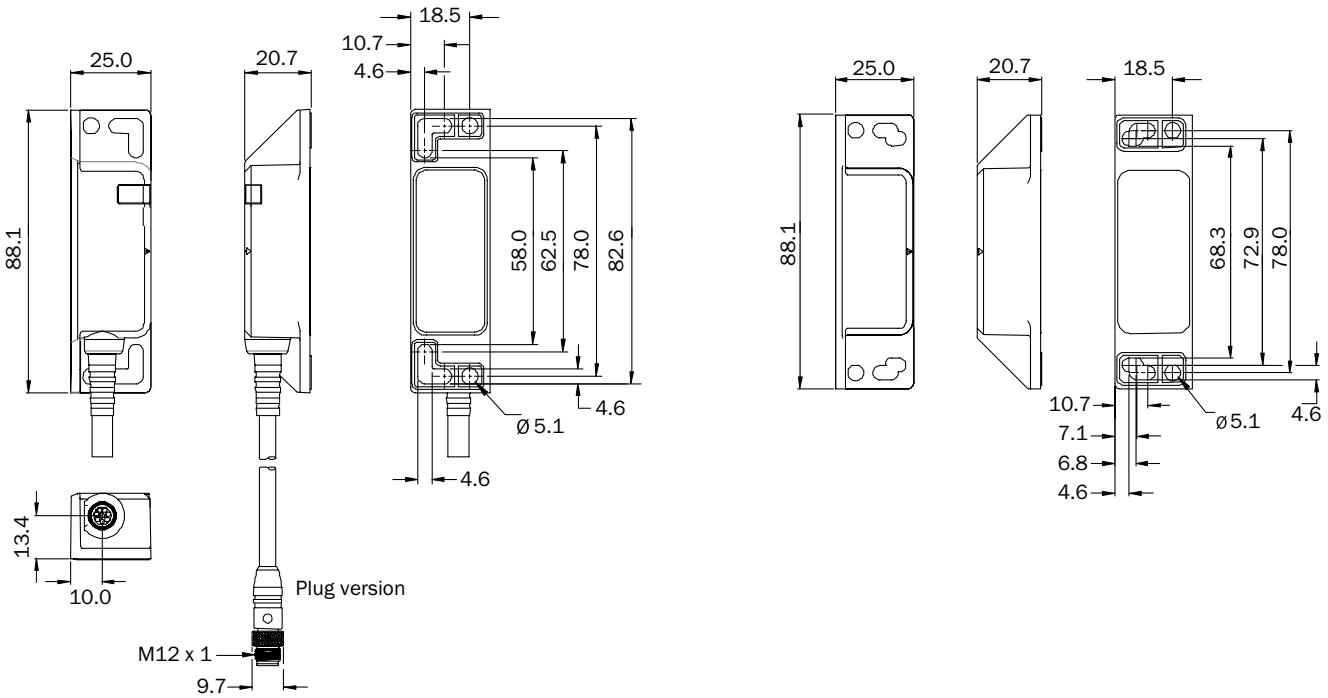
Enclosure rating	IP67 (IEC 60529) IP69K (ISO 20653)
Ambient operating temperature	–25 °C ... +70 °C
Vibration resistance	10 Hz ... 55 Hz, 3.5 mm (IEC 60068-2-6)
Shock resistance	30 g, 11 ms (EN 60068-2-27)

CERTIFICATES

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓

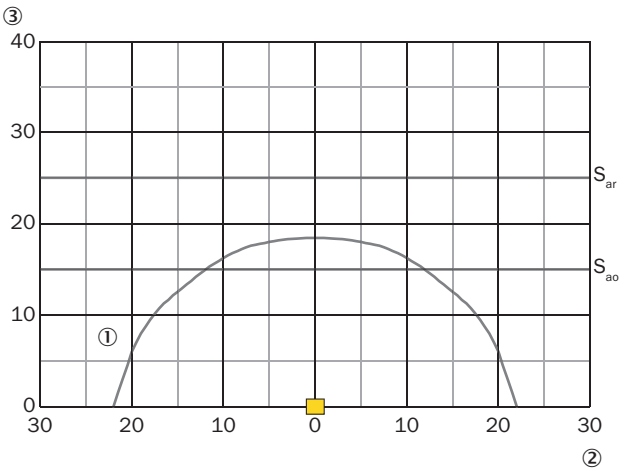
China RoHS	✓
cULus certificate	✓
EC-Type-Examination approval	✓

DIMENSIONAL DRAWING



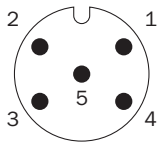
Dimensions in mm (inch)

RESPONSE RANGE



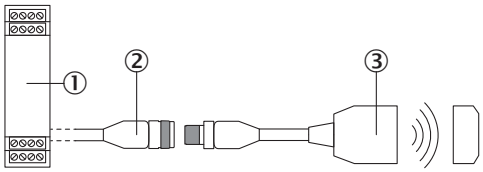
① Sensing range
② side deviation in mm
③ distance to sensor surface

PINOUTS



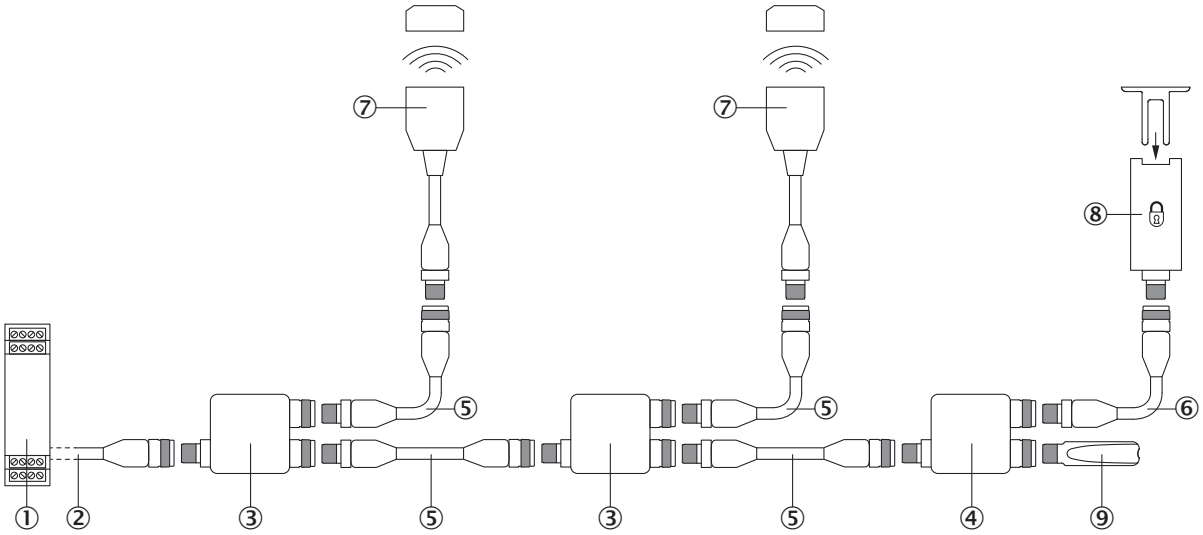
1	Voltage supply 24 V DC
2	OSSD 1
3	Voltage supply 0 V DC
4	OSSD 2
5	Aux output (not safe)

CONNECTION SINGLE SENSOR



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

SERIES CONNECTION WITH FLEXI LOOP (WITH DIAGNOSTICS)



① Flexi Soft safety controller
② connecting cable with M12 female connector, 5-pin 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 RFID safety switch (e.g., TR4-Sxx02C)
⑧ Safety locking device (e.g., i10-x0454 or i110-x0454)
⑨ FLT-TERM00001 Flexi Loop terminating element

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/6070823

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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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