

User Information

English translation

Correct Use

ZCode-LR is a coded tamper-proof safety switch for the use in machinery and plant engineering. Coding is achieved by using radio frequency (RFID) and magnetic technology, both principles need to be satisfied for the switch to operate safely. These redundant diverse structure provides the highest degree of anti-tamper, virtually impossible to override. The high specification plastic housings allow the use in almost any environments. In combination with a dual channel safety relay (e.g. ZANDER SR-Series) or a safety control (e.g. ZANDER TALOS) the switches are selfmonitoring with short-circuit protection.



Features

- High degree of anti-tamper due to redundant diverse structure (RFID and magnet)
- 2 NC safety outputs, 1 auxiliary output
- Unicode (activation by one factory set actuator) and Mastercode (any actuator will operate any switch) types available
- Wide tolerance to guard misalignment
- High specification housing IP69K, IP67
- Connect up to 20 switches to one standard safety relay
- High operational life without moving or touching parts
- Up to PL e, Cat. 4 according to EN ISO 13849-1
- Switches achieve Coding Levels Type 4, low coding with master code and Type 4, high coding with unicode version according to EN ISO 14119
- High operational life without moving or touching parts.



Product Safety
SIL/PL
Capability
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ID 0600000000

Function

Coded RFID magnetic non contact safety switches ZCode are designed to interlock hinge, sliding or removal guard doors (see Fig. 1).

The outputs of the ZCode will be switched off, if the guard door is opened. The connected safety relay will open the safety contacts immediately.

The ZCode safety switches have a RFID and magnetic sensing system which provides a wide sensing distance and provides a high tolerance to misalignment after sensing. They can be fitted behind stainless steel fittings and can operate from 4 directions even in extreme environments of temperature and moisture.



Fig. 1: Application examples

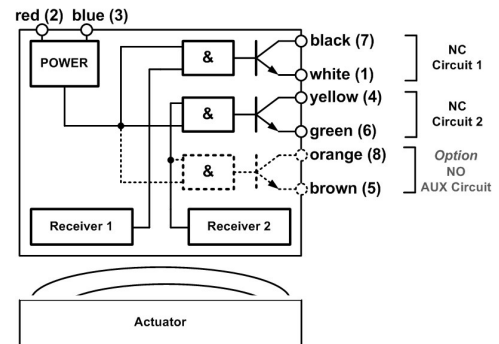


Fig. 2: Block diagram

Installation

M4 mounting bolts must be used to fix the switches and actuators. Tightening torque for mounting bolts to ensure reliable fixing is 1Nm. Always mount on to non ferrous materials. The recommended setting gap is 5mm.

The safety switches must not be used as a mechanical stop. The actuators must not be allowed to strike the switch. An adjustment by striking with a hammer is inadmissible. Do not mount adjacent switches or actuators closer than 30 mm. Typical misalignment tolerance after setting is 5 mm in any plane.



Fig. 3: Operating direction

Safety Precautions

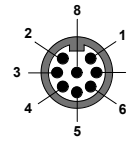


- Installation and commissioning of the device must be performed **only by authorized personnel**.
- Observe the country-specific regulations when installing the device.
- The electrical connection of the device is only allowed to be made with the device isolated.
- The wiring of the device must comply with the instructions in this user information, otherwise there is a risk that the safety function will be lost.
- It is not allowed to open the device, tamper with the device or bypass the safety devices.
- All relevant safety regulations and standards are to be observed.
- The overall concept of the control system in which the device is incorporated must be validated by the user.
- Failure to observe the safety regulations can result in death, serious injury and serious damage.
- Record any RFID codes as required by factory rules or with reference to any risk assessment for the particular application.

User Information

Electrical Connection

The installation of all ZCode - safety switches must be in accordance with a risk assessment for the individual application. For monitoring the ZCode switches, the two redundant outputs must be connected to a safety emergency stop relay (e.g. ZANDER SR) or a dual channel connection has to be made with the inputs of a safety controller (e.g. ZANDER TALOS).



View of M12-Connector

M12	Colour	Signal
2	red	operating voltage, 24V
3	blue	operating voltage, GND
7	black	safety contact 1, NC
1	white	safety contact 2, NC
4	yellow	safety contact 2, NC
6	green	safety contact 2, NC
8	orange	auxiliary contact, NO
5	brown	auxiliary contact, NO

Abb. 4 Terminals M12 Connector

Applications

When connecting one ZCode to a ZANDER emergency stop safety relay the highest Performance Level PL e, Cat. 4 will be achieved.

However, it is also possible to connect up to 20 sensors to one safety relay „SRC“ (up to PL d, safety category 3). By connection up to 10 sensors check that the power supply DC 24 V is without under voltage at the safety relay. For recognizing possible single faults each door should be opened and closed individually.

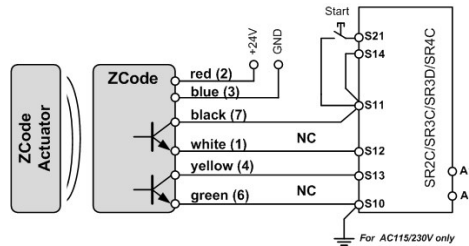


Figure 5: Single connection of a ZCode to one ZANDER SR“C“ (category 4, PL e)

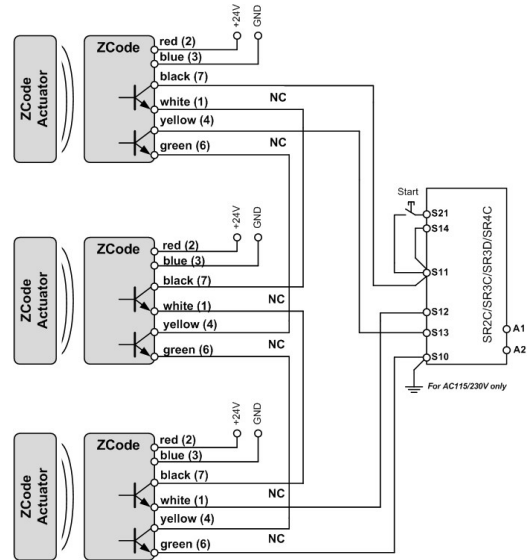


Figure 6: Connecting up to 20 ZCode in series to one ZANDER SR“C“ (safety category 3, PL d)

Commissioning Procedure

Note: The items listed under “Electrical connection” must be observed during commissioning.



1. Mounting the device:

See subitem „Installation“. Check the distance between switch and actuator.

2. Wiring:

Installation of all switches and safety relays must be in accordance to your application and the required Performance Level (see Fig. 5, Fig. 6).

Caution: Check the installation specifications of the used emergency stop safety relay. Wiring only in de-energized state.

3. Starting the device:

Switch on the operating voltage for the safety switch and safety emergency stop relay.

4. Check your application:

After installation always check each switch function by opening and closing each guard individually in turn. Ensure that the green LED at the switch and also both LED's on the safety inputs of the emergency stop safety relay are lit while the door is closed and are extinguished when the switch is open.

5. Triggering safety function:

Check that the machine stops and cannot be re-started when a switch is open.

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Maintenance

Monthly: Check alignment of actuator. Check switch case and wiring for signs of mechanical damage.

For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PL e Cat. 3/4 or once per year for PL d Cat. 3 (ISO 13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done (ISO 14119).

Check that the machine stops and cannot be re-started when each switch is open.

Check each switch function and each door individually in turn and ensure that the green light on the switch and appropriate LEDs on the safety relay are illuminated when the switch is closed and are extinguished when the switch is open. Check that the machine stops and cannot be re-started when each switch is open.

Never repair any switch, actuator or integral cables. Replace any switch displaying signs of mechanical damage to casing or cables.

The device is otherwise maintenance free, provided that it was installed properly.

What to Do in Case of a Fault?

Device does not switch on:

- Check the wiring by comparing it to the wiring diagrams.
- Check the safety switch for correct adjustment.
- Check if the green LED is lit when the switch is closed.
- Check the operating voltage.

If the fault still exists, perform the steps listed under "Commissioning Procedure".

If these steps do not remedy the fault either, return the device to the manufacturer for examination.

Opening the device is impermissible and will void the warranty.

Safety Characteristics According to DIN EN ISO 13849-1

The device is certified according to DIN EN ISO 13849-1 up to a Performance Level of PL e .

The specified PL (for applications according to Fig. 5) values were determined under the following worst-case conditions for a guard door monitoring

Note:

Additional data can be requested from the manufacturer for applications that deviate from these conditions.

DIN EN ISO 13849-1:2008-12	
Performance Level	e (Application see Figure 5)
Categorie	4
MTTF _d	1100 years
Diagnostic Coverage DC	99%
Safety Integrity Level	SIL 3
PF _D	4.18E-05 (Coressponds to 4.2% of SIL3)
PFH (1/h)	4.77E-10 (Coressponds to 4.8% of SIL3)
Utilization time	20 years
d _{op}	365 days/year
h _{op}	24 hours/day

Techn. Data

Corresponds to the standards	EN 60204-1; DIN EN ISO 13849-1; EN1088, IEC 60 947-5-3; DIN EN ISO 14119; UL508, CSA-C22.2 No.14
Approvals	CE, TÜV, UL
Power supply	DC 24V, +/- 10%, max. 50 mA
Contact rating outputs	DC 24V, max. 200 mA, short circuit proof
Contact rating auxiliary output	DC 24V, max. 200 mA, short circuit proof
Minimum switched current	10 mA
Dielectric withstand	AC 250 V
Recommended setting gap	5 mm
Switching distance, max.	10 mm close / 20 mm open
Tolerance to misalignment	5 mm in any direction from 5 mm setting gap
Switching frequency	max. 1.0 Hz
Approach speed	200 mm/min - 1000 mm/s
Body material	red polyester
Protection	IP69K, IP67
Temperature range	-25 °C to +80 °C
Shock resistance	11 ms 30 g accord. to IEC 68-2-27
Vibration resistance	10 - 55 Hz 1 mm accord. to IEC 68-2-6
Cable	PVC 6 core, 6 mm O.D. for 2 NC
Mounting	each 2 x M4 screws; 1 Nm recommended; any position
Weight	approx. 200 g

User Information

Dimension Drawing

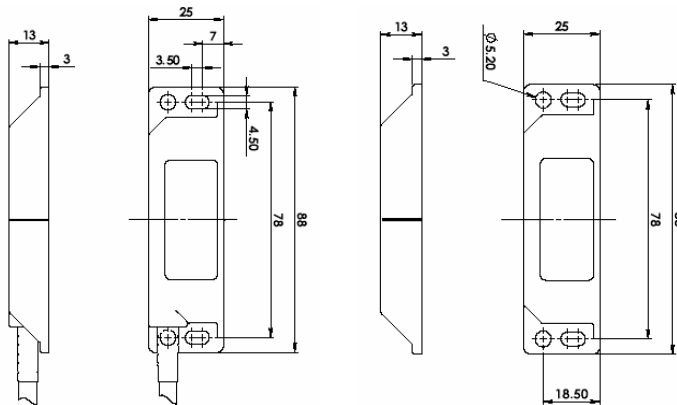


Figure 7 : Switch (left) and Actuator (right) ZCode-LR

Versions

Order No. 941144	ZCode-LR, 5m cable, 2NC/1NO, Mastercode, incl. actuator
Order No. 941145	ZCode-LR, M12, 2NC/1NO, Mastercode, incl. actuator
Order No. 941154	ZCode-LR, 5m cable, 2NC/1NO, Unicode, incl. actuator
Order No. 941155	ZCode-LR, M12, 2NC/1NO, Unicode, incl. actuator
Order No. 941149	ZCode-LR, Replacement Actuator Mastercode
Order No. 941200	M12 Extension Cable, 15 m lengths, PUR, female M12x1, open end cable

Konformitätserklärung

EC Declaration of Conformity
Déclaration de conformité

Hersteller: H. ZANDER GmbH & Co. KG
 Producer: Am Gut Wolf 15 • 52070 Aachen • Deutschland
 Fabricant:

Produktgruppe: RFID Sicherheitsschalter / Prozesssicherheit
 Product Group: RFID Safety Switches / Process Interlock
 Groupe de produits: RFID Interrupteur de sécurité / Processus gâchette

Produkt Name	Anbringung der CE-Kennzeichnung	Zertifikats-Nr.
Product Name	Affixing of CE marking	No of Certificate
Nom du produit	Application du marque CE	N° du certificat
ZCode-PR/ZCode-LR.....2015	968/FSP 1020.01/15
ZCode-MZ-LU/ZCode-MZ-SU.....2015	968/FSP 1020.01/15
ZCode-MZ-LM/ZCode-MZ-SM.....2015	968/FSP 1020.01/15
ZCode-MZA-LU/ZCode-MZA-SU.....2015	968/FSP 1020.01/15
ZCode-MZA-LM/ZCode-MZA-SM.....2015	968/FSP 1020.01/15
ZCode-MZE-LU/ZCode-MZE-SU.....2015	968/FSP 1020.01/15
ZCode-MZE-LM/ZCode-MZE-SM.....2015	968/FSP 1020.01/15

Die Produkte stimmen mit den Vorschriften folgender Europäischer Richtlinien überein:
 The products conform with the essential protection requirements of the following European directives:
 Les produits sont conformes aux dispositions des directives européennes suivantes:

2006/42/EG : Maschinenrichtlinie	2011/65/EU : RoHS Richtlinie
2006/42/EG : Machinery Directive	2011/65/EU: RoHS Directive
2006/42/EG : Directive <<Machines>>	2011/65/EU: Directive <<RoHS>>

2014/30/EU : EMV Richtlinie	ab 2016-04-20	2014/53/EU : RED Richtlinie
2014/30/EU : EMC Directive	from 2016-04-20	2014/53/EU : RED Directive
2014/30/EU : Directive <<CEM>>	dés 2016-04-20	2014/53/EU : Directive <<RED>>

Die Übereinstimmung der bezeichneten Produkte mit den Vorschriften der o.a. Richtlinie wird, falls anwendbar, nachgewiesen durch die vollständige Einhaltung folgender Normen:
 If applicable, the conformity of the designated products is proved by full compliance with the following standards:
 Le strict respect des norms suivantes confirme, s'il y a lieu, que les produits désignés sont conformes aux dispositions de la directive susmentionnée:

EN 301 489-1: V2.1.1 (2017)	EN 301 489-3: V1.6.1 (08/2013)
EN 60204-1: 2006+A1:2009+AC:2010	

Gemäß Zertifikat TÜV-Rheinland:
 According to the certificate of TÜV-Rheinland:
 Selon de organisme TÜV-Rheinland:

EN 60947-5-3: 2013	EN 62061:2005 + A2:2015
EN ISO 13849-1:2015	EN ISO 14119:2013

Dokumentationsbeauftragte/r: Christiane Nittschalk
 Documentation manager
 Autorisé à constituer le dossier technique

Aachen, den 04.08.2017
 Dipl.-Ing. Walter Zander
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 General Manager
 Direction

Dipl.-Ing. Alfons Austerhoff
 Leiter CE-Konformitätsbewertung
 Manager for EC declaration of conformity
 Responsable évaluation de conformité CE

F.3.3/03