The XCSRC is to be integrated into the safety chain for the monitoring of mobile guards (swivelling, sliding or removable). The safe state is ensured when its two redundant safety outputs (OSSDs) are switched at the OFF state (guard door opened or safety switch in error mode).

**Package Content (Example)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCSRZSRC1</td>
<td>Provided One-way M4x12mm (recommended)</td>
</tr>
<tr>
<td>XCSRZSTK1</td>
<td>Provided One-way M4x12mm (provided)</td>
</tr>
</tbody>
</table>

**Accessories**

- **Standalone Models**: XCSRc0M12
- **Daisy-chain models**: XCSRc2M12
- **Loopback device M12**: XCSRZE

**Dimensions**

- XCSRc0M12: 15.099 mm x 7.5 mm
- XCSRc2M12: 18.5 mm x 15 mm
- XCSRZE: 1.34 mm x 30 mm

**Cable connection procedures**

- XCSRc0M12: 100/3.93 mm
- XCSRc2M12: 100/3.93 mm
- XCSRZE: 100/3.93 mm

**WARNING**

- **Improper Setup or Installation**
  - This equipment must only be installed and serviced by qualified personnel.
  - Read, understand, and follow the compliance below and the complete XCSR User Manual before installing the XCSR Safety RFID switch.
  - Do not tamper with or make alterations on the unit.
  - Comply with the wiring and mounting instructions.
  - Check the connections and fastening during maintenance operations.
  - Disconnect all power before servicing equipment.
  - The proper functioning of the XCSR Safety RFID switch and its operating line must be checked on a regular basis based on the level of security required by the application (e.g., number of operations, level of environmental pollution, etc.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

These devices have been designed to be in compliance with the standards currently in effect: EN/IEC 60947-5-2, EN/IEC 60947-5-3, EN/ISO 13849-1, IEC 61508, EN/IEC 60601, EN/ISO 14119, UL 508, CSA C22.2. These devices can achieve up to category 4 PL=e or SIL 3 (if combined with an appropriate PREVENTA XPS safety unit PL=e / SIL 3 for Single and Daisy-chain models).

We welcome your comments about this document. You can reach us by e-mail at: customer-support@tesensors.com

**Note**: you can download the complete User Manual in different languages from our website at: www.tesensors.com

www.tesensors.com
**RISK OF MATERIAL DAMAGE**
- Do not use safety switch as a mechanical stop.
- Do not adjust the position of switches using a hammer or other tool likely to exceed the device's shock and vibration tolerances.
Failure to follow these instructions can result in injury or equipment damage.

**Functional directions**

**Face to Face Mounting (preferred configuration)**

**Orientation of the transponder sensitive area**

1: Reader
2: Transponder
3: Transponder sensitive area
4: Reader sensitive area

**IMPROPER SETUP OR INSTALLATION**
The XCSR RFID switch must always be mounted and used with respect to the assured sensing distances Sao and Sar:
- When the guard is closed, the maximum distance between the transponder and the reader must be Sao.
- When the guard is being opened and up to Sar, the protected machinery shall not present any risk of danger.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

**Correct Mounting Configuration**

**Wrong Mounting Configuration**

**Sao, Sar, Hr values above are given without misalignment between the transponder and the reader**

**Sr** = Real switch-ON sensing distance

**Sao** = Assured operating distance

**Sar** = Assured release distance

0 mm = 0.04 in.

**WARNING**

At every power-up phase, an automatic tuning between the transponder and the reader is performed. The aim of this automatic tuning is to reduce the environmental effects on the sensing distances (e.g. material of the mounting support, room temperature).

Thus, transponder and reader must be installed in their definitive operational conditions before operating the power-up.

**UNINTENDED EQUIPMENT OPERATION**

**Orientation of the transponder sensitive area**

1: Reader
2: Transponder
3: Transponder sensitive area
4: Reader sensitive area

**Correct Mounting Configuration**

**Wrong Mounting Configuration**

**Sao, Sar, Hr values above are given without misalignment between the transponder and the reader**

**Sr** = Real switch-ON sensing distance

**Sao** = Assured operating distance

**Sar** = Assured release distance

0 mm = 0.04 in.
Detection Curves

**A: Face to Face Mounting (preferred configuration)**

Sao and Sar sensing distances along Y axis as function of Z 
(longitudinal misalignment for X=0)

Sao and Sar sensing distances along Z axis as function of X 
(transverse misalignment for Y=0)

**B: Side by Side Mounting**

Sao and Sar sensing distances along Y axis as function of X 
(longitudinal misalignment for Z=0mm)

Sao and Sar sensing distances along Z axis as function of X 
(transverse misalignment for Y=0mm)
Minimum mounting clearances between safety switches

- **E1Min.** = 45 mm / 1.77 in.
- **E2Min.** = 150 mm / 5.91 in.
- **E3Min.** = 65 mm / 2.56 in.

Possible use of one-way screws to be ordered separately:

<table>
<thead>
<tr>
<th>One-Way Screw reference</th>
<th>Screw size</th>
<th>Sold in lots of</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCSZ71</td>
<td>∅4mm x L14mm</td>
<td>10</td>
</tr>
<tr>
<td>XCSZ72</td>
<td>∅4mm x L35mm</td>
<td></td>
</tr>
</tbody>
</table>

Electrical Connections

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+24 Vdc</td>
</tr>
<tr>
<td>2</td>
<td>OSSD2</td>
</tr>
<tr>
<td>3</td>
<td>OSSD1</td>
</tr>
<tr>
<td>4</td>
<td>Diagnosis Out (Do)</td>
</tr>
<tr>
<td>5</td>
<td>Diagnosis In (Di)</td>
</tr>
<tr>
<td>6</td>
<td>EDM_ST_1</td>
</tr>
<tr>
<td>7</td>
<td>EDM_ST_2</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Pre-Wired Female Connectors

<table>
<thead>
<tr>
<th>M12, 5 pins</th>
<th>M12, 8 pins</th>
<th>M12/M12 Female Jumpers</th>
</tr>
</thead>
<tbody>
<tr>
<td>XZCP11V12L2</td>
<td>XZCP11V12L9</td>
<td>XZCP1110064D3</td>
</tr>
<tr>
<td>XZCP11V12L10</td>
<td>XZCP11V12L20</td>
<td>XZCP1110064D5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XZCR1111064D10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XZCR1111064D25</td>
</tr>
</tbody>
</table>

Wrong Mounting Configuration

Tightening torque, tightening capacity

- **A** < 1.5 Nm (13 lb-in)
- **B** < 1 Nm (8.85 lb-in)

(*) : Blanking plugs available Q1 2018

Pre-Wired Female Connectors

<table>
<thead>
<tr>
<th>M12, 5 pins</th>
<th>M12, 8 pins</th>
<th>M12/M12 Female Jumpers</th>
</tr>
</thead>
<tbody>
<tr>
<td>XZCP11V12L2</td>
<td>XZCP11V12L9</td>
<td>XZCP1110064D3</td>
</tr>
<tr>
<td>XZCP11V12L10</td>
<td>XZCP11V12L20</td>
<td>XZCP1110064D5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XZCR1111064D10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XZCR1111064D25</td>
</tr>
</tbody>
</table>
XCSR RFID Safety Switches must be connected using both safety outputs. A single safety output, if it fails, may not stop the machine.

**IMPROPER CONNECTION**
- The XCSR RFID Safety switches must be powered by a dedicated safety extra low voltage (SELV) or a protected extra low voltage (PELV).
- The XCSR RFID Safety switches must be connected to a safety relay XPS-AK or XPSMCM.
- The XCSR RFID Safety switches operate directly from a 24 Vdc power supply. The power supply must meet the requirements of IEC 60947-5-1 (EN/IEC 61800-5-1).
- The XCSR RFID Safety switches must have force-guided contacts.

**WARNING**
- Improper connection of the XCSR RFID Safety switches may cause failure of the safety system or hazardous conditions.
- The XCSR RFID Safety switches must be installed in a manner that ensures a defined safety function.
- The XCSR RFID Safety switches must be connected to a safety controller that meets the requirements of EN/IEC 61508.

**Standalone models**
- Connection to a safety controller XPSMCM.
- Operating status of the XCSR Indicator light.
- Internal electronic fuse.
- Restart feedback.
- To the Diagnostic Module.

**Single models Connection to a safety relay XPS-AK**
- Operating status of the XCSR Indicator light.
- External start deactivated.
- ESC: External start conditions.

**Single models Connection to a safety controller XPSMCM**
- Operating status of the XCSR Indicator light.
- Connected)
- NC (Not Connected)
- To a Safety Interface.

**Daisy-chain models - Series connection**
- Connection to a safety controller XPSMCM.
- Operating status of the XCSR Indicator light.
- Internal electronic fuse.

---

Cables: XZCP1P12V12L or XCPZ12V12L

- GN/YE = Green / Yellow
- BK/WH = Black / White
- OR = Orange
- VT = Purple
- PK = Pink
- GY = Grey
- BK = Black
- BU = Blue
- BN = Brown

---

www.tesensors.com
### Characteristics

#### Product certifications
- CE, cULus (The safety function of this device has been evaluated by TÜV North, not by UL, TÜV, FCC, EAC, IC, RCM, E2)

#### Maximum Safety Level
- Up to category 4 PLe or SIL 3 (if combined with an appropriate PREVENTA XPS safety unit PLe / SIL 3 for Single and Daisy-chain models).

#### Assured operating distance (Sao)
- 10 mm (values above are given without misalignment between the transponder and the reader for face to face mounting)

#### Assured release distance (Sar)
- 35 mm (values above are given without misalignment between the transponder and the reader for face to face mounting)

#### Ambient air temperature
- Operation: -25…70 °C (-13 °F to 158 °F) without blanking plugs or -25…45 °C (-13 °F to 113 °F) with blanking plugs
- Storage: -40…85 °C (-40 °F to 185 °F)

#### Degree of protection
- Conforming EN/IEC 60529: IP65, IP66 & IP67; Conforming DIN 40050: IP69K. Enclosure type 4, 4X according to UL 50E

#### Vibration resistance
- 10 gn (10-500 Hz) conforming to EN/IEC 60068-2-6

#### Shock resistance
- 35 gn (11 ms) conforming to EN/IEC 60068-2-27

#### Protection against electric shock
- Class II conforming to EN/IEC 61140

#### Rated operating characteristics
- Ue = 24 V
- Le = 60 mA
  - The power supply must meet the requirements of EN/IEC 60204-1 relative to SELV/PELV power supply

#### Repeat accuracy
- ± 10 %, Sr

#### Hysteresis
- 3 % ± 10 %, Sr (given without misalignment between the transponder and the reader for face to face mounting)

#### Switching frequency
- < 0,5 Hz

#### Risk Time
- < 120 ms (+18 ms per additional switch in Daisy-chain configuration)

#### Response time
- Typical: < 120 ms (+50 ms per additional switch in Daisy-chain configuration) and < 250 ms (for the Standalone models)

#### First-up time
- < 5 s

#### Pairing mode time
- 15 s (after First-up time)

#### Number of switches in series connection (Daisy-chain)
- ≤ 20 XCSRC

#### PFH (according to EN/ISO 13849-1 and EN/IEC 62061)
- 5.10^-10

#### Mission Time (TM)
- 20 years

#### OSSD
- Standalone XCSRC
  - Ιmax=100 mA per output at 24 Vdc
  - Drop out voltage: < 2 Vdc, Leakage current (OFF state): < 1 mA
  - Maximum Load capacitance: 49 μF under 24 Vdc
- Single and Daisy-chain: XCSRC and XCSRC
  - Ιmax=200 mA per output at 24 Vdc
  - Drop out voltage: < 2 Vdc, Leakage current (OFF state): < 1 mA
  - Maximum Load capacitance: 49 μF under 24 Vdc

### Operating and output States, LED meaning

<table>
<thead>
<tr>
<th>Operating state</th>
<th>Color LED1 (TR)</th>
<th>Color LED2 (RD)</th>
<th>OSSDs</th>
<th>LEDs meaning</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>XCSR reader is unpowered</td>
<td></td>
</tr>
<tr>
<td>Initialization</td>
<td>Orange</td>
<td>Orange</td>
<td>OFF</td>
<td>XCSR reader initialization in progress</td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td>Orange Fast blinking</td>
<td>Orange Fast blinking</td>
<td>OFF</td>
<td>Pairing with new transponder done. New power-up required</td>
<td>Only for &quot;re-pairing enabled models&quot;</td>
</tr>
<tr>
<td>Green</td>
<td>Orange Fast blinking</td>
<td>Red</td>
<td>OFF</td>
<td>Maximum of pairing reached</td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Red</td>
<td>OFF</td>
<td>Invalid transponder detected</td>
<td>Transponder not blank or not Telemecanique transponder</td>
<td></td>
</tr>
<tr>
<td>Orange Fast blinking</td>
<td>Red</td>
<td>OFF</td>
<td>Pairing process unsuccessful</td>
<td>Only for &quot;re-pairing enabled models&quot;</td>
<td></td>
</tr>
<tr>
<td>Run</td>
<td>Green</td>
<td>ON</td>
<td>Paired transponder detected but the safety inputs are at the OFF state.</td>
<td>For Daisy-Chain models. At least one of the previous readers has its OSSDs at the OFF state (door opened, error detected or OFF state)</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>Green</td>
<td>OFF</td>
<td>Paired transponder detected and all other operating conditions are correct</td>
<td>Door closed</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>Red blinking</td>
<td>Red blinking</td>
<td>OFF</td>
<td>Invalid transponder or non-paired transponder detected. New power-up required after fault clearance</td>
<td>Possible attempted fraud or transponder damaged</td>
</tr>
<tr>
<td>Green</td>
<td>OFF</td>
<td>1, 2, 3 or 4 red flashes</td>
<td>OFF</td>
<td>Internal error detected. Contact the customer support of your country</td>
<td>The color of the LED1 depends on the presence of the transponder: ● Green: transponder detected ● OFF: no transponder detected</td>
</tr>
</tbody>
</table>

NOTE: The safe state is ensured when the two redundant safety outputs (OSSDs) are switched at the OFF state (i.e. guard door opened or safety switch in error mode).