SCR-1 Emergency Stop Relay  2NC Outputs

The SCR-1 is a low cost all purpose Safety Relay that ensures the quick and safe deactivation of the moving parts of a machine in case of danger. Internal fault monitoring takes place during restart via the start button.

Applications include single and dual channel emergency stop circuits or dual channel safety guard monitoring using Tongue switches.

Features:
2 safe, redundant safety output contacts

Standards:  EN 60204-1, EN954-1, ISO13849-1, EN62061
Up to Category 3 to EN 954-1
Up to PLe to ISO13849-1  SILCL 2  EN62061
Single or Dual Channel input – LED indication of input status
Redundancy and cycle monitoring
Feedback loop for monitoring contactors or expansion modules
22mm Din Rail Mounting

Applications:

Single channel Interlocking to PLC ISO13849-1 and Cat.1.

SCR-1

- Manual start.
- Automatic start.

A1 A2 S11 S21

Dual channel interlocking to PLC ISO13849-1  Cat.3.

SCR-1

- Manual start.
- Automatic start.

A1 A2 S21

Block diagram and electrical connection

A1 A2 Power
S11 24V,dc control voltage
S21 Control line
13-14 Safety Output Contact 1
23-24 Safety Output Contact 2

Feedback circuit.
The feedback circuit monitors machine contactors or expansion modules.

Safety Classification and Reliability Data:
The specified PL or SILCL were determined under worst case conditions:

ISO 13849-1:
- Performance level: d
- Category (ISO13849-1 / EN 954-1): 3
- MTTFd: 484 years
- DC (avg.): 96.6%
- Proof Test Interval (Life): 20 years
- Safety Data Annual usage: 365 days per year
- Test cycle 3600 seconds / cycle
- Full Load AC15

EN 62061:
- SILCL: 2
- Proof Test Interval (Life): 20 years
- Hardware fault tolerance: 1
- DC (avg.): 96.6%
- Safe Failure Fraction SFF: 99.9%
- PFHd: 2.70 x 10^11

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Supply Voltage</th>
<th>EN 954-1 Category</th>
<th>Switch Input Circuits</th>
<th>Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180009</td>
<td>SCR-1</td>
<td>24V.ac/dc</td>
<td>Up to Cat.3</td>
<td>2 NC</td>
<td>2NC</td>
</tr>
</tbody>
</table>

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**SCR-2 Safety Monitoring Relay 2NC Outputs**

The SCR-2 is an all purpose Safety Monitoring Relay that ensures the quick and safe deactivation of the moving parts of a machine in case of danger.

Applications include single and dual channel emergency stop circuits or dual channel safety guard monitoring using Tongue switches or Non Contact Switches.

**Features:**

- 2 Force guided safety output contacts
- Standards: EN 60204-1, EN954-1, ISO13849-1, EN62061
- Stop Category: 0
- Up to Category 4 to EN 954-1
- Up to PLe to ISO13849-1
- SIL CL 3 - EN62061
- Single or Dual Channel input – LED indication of input status
- Redundancy and cycle monitoring
- Feedback loop for monitoring contactors or expansion modules
- Short circuit and earth fault monitoring
- 22mm Din Rail Mounting

**Function:**

The SCR-2 is designed in accordance with EN 60204-1 for safety circuits and they may be applied for up to PLe ISO13849-1 or Cat.4 EN954-1.

The internal logic system closes the relay safety outputs when the start button is pressed.

If the control lines are opened by operation of a Safety Switch or E Stop button then the safety output contacts are opened and safely switch off the supply to the machine. It is ensured that a single fault does not lead to the loss of the safety function and that cyclic monitoring means that any fault is detected no later than the next start up.

**Block diagram and electrical connection**

- A1 A2 Power 24V dc control voltage
- S11 S10 S13 S14 S12 Control lines
- S21 Start Control Line
- 13-14 Safety Output Contact 1
- 23-24 Safety Output Contact 2

**Safety Classification and Reliability Data:**

ISO 13849-1: The specified PL or SIL/CL were determined under worst case conditions:

- Performance level: e
- Category (ISO13849-1 / EN 954-1): 4
- MTTF: 848 years
- DC (avg.): 99%
- Test cycle: 24 hours per day
- 365 days per year
- Test cycle: 3600 seconds / cycle
- Full Load AC15

- EN 62061:
- SIL CL 3
- Proof Test Intervals (Life) 20 years
- Hardware fault tolerance 1 99%
- Safe Failure Fraction SFF 96.6%
- PFHx 2.70 x 10^-11

**Table:**

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Terminal Type</th>
<th>Supply Voltage</th>
<th>Switch Input Circuits</th>
<th>Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180001</td>
<td>SCR-2</td>
<td>Standard Screw Terminals</td>
<td>24V, ac/dc</td>
<td>2 NC</td>
<td>2NC</td>
</tr>
<tr>
<td>180001-P</td>
<td>SCR-2</td>
<td>Pluggable Screw Terminals</td>
<td>24V, ac/dc</td>
<td>2 NC</td>
<td>2NC</td>
</tr>
</tbody>
</table>

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Safety Relays - SCR-3

SCR-3 Safety Monitoring Relays 3NC 1NO Outputs

The SCR-3 is an all purpose Safety Monitoring Relay that ensures the quick and safe deactivation of the moving parts of a machine in case of danger.

Applications include single and dual channel emergency stop circuits or dual channel safety guard monitoring using Tongue switches or Non Contact Switches.

Features:

3 Force guided safety output contacts
1 Auxiliary output contact
Standards: EN 60204-1, EN954-1, ISO13849-1, EN62061
Stop Category: 0
Up to Category 4 to EN 954-1
Up to PLe to ISO13849-1
SILCL 3 EN62061
Single or Dual Channel input – LED indication of input status
Redundancy and cycle monitoring
Feedback loop for monitoring contacts or expansion modules
Short circuit and earth fault monitoring
22mm Din Rail Mounting
Choice of 24Vac/dc, 110Vac or 230Vac supply (by part number)

Function:

The SCR-3 is designed in accordance with EN 60204-1 for safety circuits and they may be applied for up to PLe ISO13849-1 or Cat.4 EN954-1.

The internal logic system closes the relay safety outputs when the start button is pressed.

If the control lines are opened by operation of a Safety Switch or E Stop button then the safety outputs are opened and safety switch off the supply to the machine. It is ensured that a single fault does not lead to the loss of the safety function and that cyclic monitoring means that any fault is detected no later than the next start up.

SCR-3

Standards EN60204-1, EN 292, EN 418, EN60204-1
EN 954-1, ISO13849-1, EN 1088 EN62061

Monitored Safety Inputs Circuits 2 NC or 1NC from Safety Switches
Safety Switching Outputs 3 NC positively guided
Auxiliary outputs 1 NO
Operating voltage AC230V, AC110V AC/DC24V by part number
Supply deviation +/ - 10%
Control voltage AC24V, DC
Control current S11 to S14 40mA approx.
Monitored Reset Circuit loop Auto or Monitored Manual Reset
Maximum line conductor cross section 2.5 sq.mm
Maximum length of control line 1000m. with 0.75 Sq.mm
Contact material AgNi
Indication - Green LED 1 internal relay K1 energised
Contact service life Mechanical 1 x 10⁸, Electrical 1 x 10⁹
Safety Contact breaking capacity AC 250V, 2500VA, 8A. ohmic
DC 24V, 48V, 2.0A, DC13
(Max. total Current 15A).
Auxiliary Contact breaking capacity AC 250V, 500VA, 2A.
DC 50V, 30W, 1.25A, ohmic
External Fuse protection – Safety outputs 4A slow blow or 6A quick blow
Minimum voltage and current 24V, 20mA, dc
Response time on output opening 90 ms
Rated insulation voltage 250V
Degree of protection IP20
Rated impulse withstand voltage 4kV
Operating temperature -15°C +40°C
IP Protection IEC529 Terminals IP20
Mounting 35mm DIN rail
Weight 0.23kg approx.

Block diagram and electrical connection

Safety Classification and Reliability Data:
The specified PL or SILCL were determined under worst case conditions:

ISO 13849-1:

<table>
<thead>
<tr>
<th>Performance level</th>
<th>Category (ISO13849-1 / EN 954-1)</th>
<th>SIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>MTTFd (hours)</td>
<td>567</td>
<td>20</td>
</tr>
<tr>
<td>Proof Test Interval (Life)</td>
<td>365 days per year</td>
<td>20 years</td>
</tr>
</tbody>
</table>

EN 62061:

<table>
<thead>
<tr>
<th>Safety Data Annual usage</th>
<th>SILCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC (avg.)</td>
<td>99%</td>
</tr>
<tr>
<td>Safe Failure Fraction SFF</td>
<td>99.8%</td>
</tr>
<tr>
<td>PFHd</td>
<td>4.10 x 10⁻¹¹</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Terminal Type</th>
<th>Supply Voltage</th>
<th>Switch Input Circuits</th>
<th>Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180002</td>
<td>SCR-3</td>
<td>Standard Screw Terminals</td>
<td>24V ac/dc</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180003</td>
<td>SCR-3</td>
<td>Pluggable Screw Terminals</td>
<td>230V ac</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180004</td>
<td>SCR-3</td>
<td>Standard Screw Terminals</td>
<td>110V ac</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180002-P</td>
<td>SCR-3</td>
<td>Standard Screw Terminals</td>
<td>24V ac/dc</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180003-P</td>
<td>SCR-3</td>
<td>Pluggable Screw Terminals</td>
<td>230V ac</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180004-P</td>
<td>SCR-3</td>
<td>Standard Screw Terminals</td>
<td>110V ac</td>
<td>2 NC</td>
<td>3NC 1NO</td>
</tr>
</tbody>
</table>

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SCR-4-TD Safety Monitoring Relays

The SCR-4-TD are all purpose Safety Monitoring Relays that combine time delayed and non time delayed contacts in a compact 22.5mm housing.

This permits dangerous components of a system to be switched off quickly and safely, whilst at the same time other circuits still be supplied with voltage for up to 30 seconds (adjusted on the SCR-4-TD by a potentiometer).

Features:

Force guided safety output contacts – available in 3 variants

Standards: EN 60204-1, EN 505-1, ISO13849-1, EN62061
Stop Category: 0 (non time delayed) 1 (time delayed)
Up to Category 4 to EN 954-1
Up to PLe to ISO13849-1 SILCL 3 EN62061
Single or Dual Channel input – LED indication of input status
Redundancy and cycle monitoring
Feedback loop for monitoring contactors or expansion modules
Short circuit and earth fault monitoring
22mm Din Rail Mounting

Function:

If the application requires time delayed opening of a safety circuit following activation of the stop signal then the SCR-4-TD range will provide combination of instant and variable delayed contacts.

This may be useful for applications that rely on PLC control to provide an initial controlled shutdown but ultimately requires a delayed opening of a safety circuit.

Variants:

<table>
<thead>
<tr>
<th>SCR-4-TD-1</th>
<th>SCR-4-TD-2</th>
<th>SCR-4-TD-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instant 3NC</td>
<td>Instant 2NC</td>
<td>Instant 1NC</td>
</tr>
<tr>
<td>Delayed 1NC</td>
<td>Delayed 2NC</td>
<td>Delayed 3NC</td>
</tr>
</tbody>
</table>

SCR-4-TD

Standards: EN60204-1, EN 292, EN 418, EN60204-1
EN 954-1, ISO13849-1, EN 1089 EN62061

- 2 NC or 1 NC
- 1 NC

- DCDC24V
- 30 seconds continuously adjustable
- 4 NC

- MTCF
- DC (avg)
- Proof Test Interval (Life)
- Safety Data Annual usage

- SIL CL

Safety Classification and Reliability Data:

The specified PL or SILCL were determined under worst case conditions:

- ISO 13849-1:
  - Category: ISO13849-1 / EN 954-1
  - MTTF
  - DC (avg)
  - Proof Test Interval (Life)
  - Safety Data Annual usage

- EN 60206:
  - SILCL
  - Proof Test Interval (Life)
  - Hardware fault tolerance DC (avg)
  - Safe Failure Fraction SFF
  - PFHn Non delayed PFHn Delayed

- 4 Non delayed 3 Delayed
- 73.36 years
- 98% Non delayed 90% Delayed
- 10 years
- 261 days per year
- 16 hours per day
- Test cycle 180 seconds

- Low Load AC

- 3 Non delayed
- 20 years
- 99% Non delayed 90% Delayed

- 5.59 x 10^8
- 6.85 x 10^8

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Supply Voltage</th>
<th>Switch Input Contacts</th>
<th>Instant Output Contacts</th>
<th>Delayed Output Contacts</th>
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</thead>
<tbody>
<tr>
<td>1800003</td>
<td>SCR-4-TD-1</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>3NC</td>
<td>1NC</td>
</tr>
<tr>
<td>1800006</td>
<td>SCR-4-TD-2</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>2NC</td>
<td>2NC</td>
</tr>
<tr>
<td>1800007</td>
<td>SCR-4-TD-3</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>1NC</td>
<td>3NC</td>
</tr>
<tr>
<td>1800007-P</td>
<td>SCR-4-TD-1</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>3NC</td>
<td>1NC</td>
</tr>
<tr>
<td>1800006-P</td>
<td>SCR-4-TD-2</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>2NC</td>
<td>2NC</td>
</tr>
<tr>
<td>1800007-P</td>
<td>SCR-4-TD-3</td>
<td>24V ac/dc</td>
<td>2NC</td>
<td>1NC</td>
<td>3NC</td>
</tr>
</tbody>
</table>
SEU-1 Expansion Module - for use with SCR-2 and SCR-3

SEU-1 Safety Expansion Relay offering 3NC Outputs

The SEU-1 is an expansion unit which offers 3 additional NC Safety Output Contacts. An existing system using SCR-2 or SCR-3 can be expanded modularly. The safety actuation is achieved from the basic SCR-2 or SCR-3 relay.

Features:

3NC relay outputs
1NO auxiliary contact – (fault monitoring)
Standards: EN 60204-1, EN954-1, ISO13849-1, EN62061
Stop Category: 1
Up to Category: 4 EN 954-1
Up to: PLe ISO13849-1
Force Guided Contacts: 3
Fault Monitoring by basic SCR device.

Block diagram and electrical connection SEU-1

A1 A2 Power
S11 24V,dc control voltage
S10 S15 S16 Control lines
S23 S24 Fault monitoring
13-14 Safety Contact 1
23-24 Safety Contact 2
33-34 Safety Contact 3

SEU-1

Standards
EN60204-1, EN 292, EN 418, EN60204-1
EN 954-1, ISO13849-1, EN 1088 EN62061

Safety Switching Outputs 3 NC
Auxiliary Contact 1 NO
Operating voltage ACDC24V AC110V AC230V by part number
Supply deviation +/-10%
Control voltage at S11 24V,dc
Control current S11 to S14 40mA approx.
Maximum line conductor cross section 2.5 sq.mm
Maximum length of control line 100m, with 0.75 Sq.mm
Contact material AgNi
Indication - Green
Contact service life Mechanical 1 x 10⁶ Electrical 1 x 10⁶
Safety Contact breaking capacity AC 250V, 1500VA, 6A, ohmic
DC 24V, 4A for AC15
DC 24V, 30V, 1.25A, ohmic
DC 24V, 30V, 2.0A for DC-13
4A slow blow or 6A quick blow
24V, 24mA dc

External Fuse protection – Safety outputs
Minimum voltage and current... 250V
Rated insulation voltage... 4 kV
Degree of protection... IP20
Rated impulse withstand voltage... 4 kV
Operating temperature... -15°C +40°C
IP Protection... IEC529
Mounting... 35mm DIN rail
Weight... 0.25kg approx.

ISO 13849-1: Performance level
Category (ISO13849-1 / EN 954-1)
MTTFd 4
DC (avg.) 567 years
99%
Proof Test Interval (Life) 20 years
Safety Data Annual usage 365 days per year
24 hours per day
3600 seconds/cycle
Full Load AC15

EN 602061:
SIILCL 3
Proof Test Interval (Life) 20 years
Hardware fault tolerance 1
DC (avg.) 99%
Safe Failure Fraction SFF 95.6%
PFHd 4.10 x 10⁻⁶

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Terminal Type</th>
<th>Supply Voltage</th>
<th>Output Contacts</th>
<th>Auxiliary Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180010</td>
<td>SEU-1</td>
<td>Standard</td>
<td>24V ac/dc</td>
<td>3NC</td>
<td>1NO</td>
</tr>
<tr>
<td>180011</td>
<td>SEU-1</td>
<td>Screw</td>
<td>110V,ac</td>
<td>3NC</td>
<td>1NO</td>
</tr>
<tr>
<td>180012</td>
<td>SEU-1</td>
<td>Terminals</td>
<td>230V,ac</td>
<td>3NC</td>
<td>1NO</td>
</tr>
<tr>
<td>180010-P</td>
<td>SEU-1</td>
<td>Pluggable</td>
<td>24V,ac/dc</td>
<td>3NC</td>
<td>1NO</td>
</tr>
<tr>
<td>180011-P</td>
<td>SEU-1</td>
<td>Screw</td>
<td>110V,ac</td>
<td>3NC</td>
<td>1NO</td>
</tr>
<tr>
<td>180012-P</td>
<td>SEU-1</td>
<td>Terminals</td>
<td>230V,ac</td>
<td>3NC</td>
<td>1NO</td>
</tr>
</tbody>
</table>

The specified PL or SIILCL were determined under worst case conditions.
SEU-TD-1 Safety Expansion Relay offering delayed outputs

The SEU-TD-1 is an expansion unit which can be used with an existing system using SCR-2 or SCR-3 to allow delayed shutdown or timing to a safety application. Time Delay is variable 1-30s. The safety actuation is achieved from the basic SCR-2 or SCR-3 relay.

Features:

- 3NC relay outputs
- 1NO auxiliary contact
- Standards: EN 60204-1, EN954-1, ISO13849-1, EN62061
- Stop Category: 1
- Up to Category: 3 EN 954-1
- Up to: PLd ISO13849-1
- Force Guided Contacts: 3
- Fault Monitoring by basic SCR device.

Block diagram and electrical connection SEU-TD-1

<table>
<thead>
<tr>
<th>Power</th>
<th>24V dc control voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>S11</td>
<td>Control lines</td>
</tr>
<tr>
<td>S15</td>
<td>17-18 Safety Contact 1</td>
</tr>
<tr>
<td>S16</td>
<td>27-28 Safety Contact 2</td>
</tr>
<tr>
<td>S25</td>
<td>37-38 Safety Contact 3</td>
</tr>
<tr>
<td>S26</td>
<td>Fault monitoring</td>
</tr>
</tbody>
</table>

Safety Classification and Reliability Data:

- The specified PL or SIL CL were determined under worst case conditions.
- ISO 13849-1:
  - Performance level: d
  - Category (ISO 13849-1 / EN 954-1): 3
  - MTTFd: 487 years
  - DC (avg.): 92.1%
  - Proof Test Interval (Life): 20 years
  - Safety Data Annual usage: 365 days per year
  - 24 hours per day
  - 3600 seconds / cycle
  - Full Load AC1

- SIL CL:
  - SIL CL: 2
  - Proof Test Interval (Life): 20 years
  - Hardware fault tolerance: 1
  - DC (avg.): 92.1%
  - Safe Failure Fraction SFF: 94%
  - PFHd: 3.68 x 10^-13

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Terminal Type</th>
<th>Supply Voltage</th>
<th>Delayed Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180015</td>
<td>SEU-TD-1</td>
<td>Standard Screw</td>
<td>24V ac/dc</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180016</td>
<td>SEU-TD-1</td>
<td>Terminals</td>
<td>110V ac</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180017</td>
<td>SEU-TD-1</td>
<td>Terminal</td>
<td>230V ac</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180015-P</td>
<td>SEU-TD-1</td>
<td>Pluggable Screw</td>
<td>24V ac</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180016-P</td>
<td>SEU-TD-1</td>
<td>Terminals</td>
<td>110V ac</td>
<td>3NC 1NO</td>
</tr>
<tr>
<td>180017-P</td>
<td>SEU-TD-1</td>
<td>Terminals</td>
<td>230V ac</td>
<td>3NC 1NO</td>
</tr>
</tbody>
</table>
SCR-2H  2 Hand Control Safety Monitoring Relay

The SCR-2H is a compact, universal 2 hand control safety relay. It complies with EN574, Type IIIC and is intended for use in safety circuits designed in accordance with EN60204-1.

Features:
- 2 Force guided safety output contacts
- Standards: EN 574, EN 60204-1, EN954-1, ISO13849-1, EN62061
- Stop Category: 0
- Up to Category 4 EN954-1 and IIIC EN574
- Up to PLe ISO13849-1 SIL CL3 EN62061
- Redundancy and cycle monitoring
- Short circuit monitoring
- 22mm Din Rail Mounting

Principle of operation:

The SCR-2H is suitable for connection of two hand buttons with one normally closed contact and one normally open contact. When the operating voltage is applied to A1 and A2 and the feedback loop X1 and X2 is closed, the SCR-2H is ready for use. The output contacts only close when the 2 hand buttons T1 and T2 are operated simultaneously (within 0.5s). The output contacts do not close if only one button is operated or the feedback loop is open. Short or open circuits are detected. In order to trigger a new operation both buttons must have been released and the feedback loop closed.

It is important to arrange the buttons such that accidental operation or easy bypass cannot be achieved, and in accordance with EN574 and EN999.

EN574 – the buttons must be arranged such that operation of both buttons using one hand is prevented i.e. a minimum distance apart of 260mm but also so as to prevent actuation by other parts of the body (forearm, elbow, hip etc.).

EN999 – it is necessary to maintain a minimum distance between the 2 hand buttons and the hazard on the machine.

<table>
<thead>
<tr>
<th>SCR-2H Standards</th>
<th>EN60204-1, EN954-1, ISO13849-1, EN 574, EN62061</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Switching Outputs</td>
<td>2 NC: positively guided</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>AC230V, AC110V AC/DC24V by part number</td>
</tr>
<tr>
<td>Supply deviation</td>
<td>+1% -10%</td>
</tr>
<tr>
<td>Control voltage at S12-S13</td>
<td>24V dc</td>
</tr>
<tr>
<td>Control current to buttons</td>
<td>20mA approx.</td>
</tr>
<tr>
<td>Release time for the NC contacts after release of buttons</td>
<td>&lt;20ms</td>
</tr>
<tr>
<td>Synchronisation time</td>
<td>&lt;0.5s</td>
</tr>
<tr>
<td>Maximum line conductor cross section</td>
<td>2.5 sq.mm</td>
</tr>
<tr>
<td>Maximum length of control line</td>
<td>1000m, with 0.75 Sq.mm</td>
</tr>
<tr>
<td>Contact material</td>
<td>AgNi</td>
</tr>
<tr>
<td>Indication - Green</td>
<td>LED 1 internal relay K1 energised</td>
</tr>
<tr>
<td></td>
<td>LED 2 internal relay K2 energised</td>
</tr>
<tr>
<td></td>
<td>LED 1 and 2 OSSD closed</td>
</tr>
<tr>
<td></td>
<td>Mechanical 1 x 10[^2] Electrical 1 x 10[^3]</td>
</tr>
<tr>
<td>Contact service life</td>
<td>AC 230V, 1500VA, 6A, ohmic</td>
</tr>
<tr>
<td></td>
<td>DC 230V, 1.25A, ohmic</td>
</tr>
<tr>
<td>Safety Contact breaking capacity</td>
<td>24V, 30W, 2.5A for DC/13</td>
</tr>
<tr>
<td></td>
<td>24V, 30W, 2.5A for DC/13</td>
</tr>
<tr>
<td>External Fuse protection – Safety outputs</td>
<td>4A slow blow or 6A quick blow</td>
</tr>
<tr>
<td>Minimum voltage and current</td>
<td>24V, 20mA dc</td>
</tr>
<tr>
<td>Rated Inrush voltage</td>
<td>250V</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Rated impulse withstand voltage</td>
<td>140V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-15°C to +40°C</td>
</tr>
<tr>
<td>IP Protection</td>
<td>IEC529</td>
</tr>
<tr>
<td>Mounting</td>
<td>30mm DIN rail</td>
</tr>
<tr>
<td>Weight</td>
<td>0.23kg approx.</td>
</tr>
</tbody>
</table>

Safety Classification and Reliability Data:

ISO 13849-1: Performance level e
Category (ISO13849-1 / EN954-1) 4
MTTdf DC (avg) 96.6 years
99%

Test interval (Life) 10 years
261 days per year
16 hours per day
7.5 seconds / cycle
Low Load AC1

EN62061:
SILCL 3

Proof Test Interval (Life) 10 years
261 days per year
16 hours per day
7.5 seconds / cycle

Hardware fault tolerance 1

Safe Failure Fraction SFF 99.8%

PFHd 2.56 x 10[^5]

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Terminal Type</th>
<th>Supply Voltage</th>
<th>Output Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>180030</td>
<td>SCR-2H</td>
<td>Standard Screw Terminals</td>
<td>24V ac/dc</td>
<td>2NC</td>
</tr>
<tr>
<td>180031</td>
<td>SCR-2H</td>
<td>Pluggable Screw Terminals</td>
<td>110V ac</td>
<td>2NC</td>
</tr>
<tr>
<td>180030-P</td>
<td>SCR-2H</td>
<td>Standard Screw Terminals</td>
<td>24V ac/dc</td>
<td>2NC</td>
</tr>
<tr>
<td>180031-P</td>
<td>SCR-2H</td>
<td>Pluggable Screw Terminals</td>
<td>230V ac</td>
<td>2NC</td>
</tr>
<tr>
<td>180032-P</td>
<td>SCR-2H</td>
<td>Standard Screw Terminals</td>
<td>110V ac</td>
<td>2NC</td>
</tr>
</tbody>
</table>

www.idemssafety.com
SCR-7  Safety Monitoring Relay  7NC Relay Outputs

The SCR-7 is an all purpose Safety Monitoring Relay with seven relay outputs that ensure the quick and safe deactivation of the moving parts of a machine in case of danger.

Applications include single and dual channel emergency stop circuits or dual channel safety guard monitoring using Tongue switches or Non Contact Switches.

Features:

7 Force guided safety output contacts
4 Auxiliary output contacts
2 Auxiliary transistor outputs

Standards: EN 60204-1, EN954-1, ISO13849-1, EN62061
Stop Category: 0
Up to Category 4 to EN 954-1
Up to PLe to ISO13849-1
SILC L3  EN62061
Single or Dual Channel input – LED indication of input status
Redundancy and cycle monitoring
Feedback loop for monitoring contactors
Short circuit and earth fault monitoring
22mm Din Rail Mounting

Function:

The SCR-7 is designed in accordance with EN 60204-1 for safety circuits and they may be applied for up to PLe ISO13849-1 or Cat.4 EN954-1.

The internal logic system closes the relay safety outputs when the start button is pressed.

If the control lines are opened by operation of a Safety Switch or E Stop button then the safety output contacts are opened and safety switch off the supply to the machine. It is ensured that a single fault does not lead to the loss of the safety function and that cyclic monitoring means that any fault is detected no later than the next start up.

SCR-7 Standards
EN60204-1, EN 292, EN 418, EN60204-1
EN 954-1, ISO13849-1, EN 1088
EN62061

Safety Classification and Reliability Data:

The specified PL or SILCL were determined under worst case conditions:

- ISO 13849-1:
  - Performance level: e
  - Category (ISO13849-1 / EN 954-1):
  - SILCL: 3
  - Proof Test Interval (Life): 20 years
  - Safety Data Annual usage: 365 days per year
  - Test cycle 3600 seconds / cycle
  - Full Load AC15

- EN 62061:
  - SILCL: 3
  - Proof Test Interval (Life): 20 years
  - Hardware fault tolerance: 99%
  - DC (avg.) Safety Failure Fraction SFF PFHd: 99.5%

SCR-7 Monitored Safety Inputs Circuits

- Safety Switching Outputs
  - 7 NC positively guided
  - 4 NO

SCR-7 Auxiliary outputs

- Auxiliary transistor outputs O1 O2
- 24V dc 30mA (overcurrent protection)
  - AC/DC24V + / - 10%

SCR-7 Operating voltage

- Control voltage at S11
- 24V:dc
- Control current S11 to S14
- 250mA approx.

SCR-7 Monitored Reset Circuit loop

- Maximum line conductor cross section: 2.5 sq.mm
- Maximum length of control line: 2 x 500m, with 0.75 sq.mm AgSnO2

SCR-7 Indication - Green

- Contact material: WVR
- LED 1: interal relay K1 energised
- LED 2: internal relay K2 energised
- Mechanical: 1 x 10^5 Electrical: 1 x 10^6
- AC: 250V, 2000VA, 8A, ohmic 230V, 3A for AC15
- DC: 24V, 3.0A, DC13
  - (Max. total Current 20A), 7.6A slow blow or 8A quick blow

SCR-7 Contact service life

- Safety Contact breaking capacity

- Auxiliary Contact breaking capacity

- External Fuse protection – Safety Current
- Minimum voltage and current
- Response time on output opening
- Rated insulation voltage
- Rated impulse withstand voltage
- Operating temperature
- IP Protection
- Mounting
- Weight

SCR-7 Sales Number

- Type: SCR-7
- Terminal Type: Standard Screw Terminals
- Switch Input Circuits: 2NC, 7NC, 4NO
- Output Contacts: 4NO

- Type: SCR-7
- Terminal Type: Pluggable Screw Terminals
- Switch Input Circuits: 2NC
- Output Contacts: 7NC, 4NO

www.idemosafety.com
Modus - Plug and Expand Safety Control Modules for Safety Switches

Expandable Safety Modules for use with Interlock Switches and Rope Switches

**MM-1 Basic Module**
- Basic unit with 2 Dual Channel Safety Inputs for connection of switches, 3NC Safety Outputs and signal and communication functions.
- Extendable with all MODUS modules.
- Safety Category 4
- 2NC Safety Inputs (Dual NC/NC)
- 3 Relay Outputs
- 6 Semi-conductor Monitoring Outputs
- Short circuit and earth fault monitoring Diagnostic LED’s
- Manual or Automatic activation
- RS 485 interface
- Operating Voltage: 24V dc  +/- 10%
- Relay Outputs: 250V ac 8A. AC12
- 24V dc 3A. DC13

**IPM2G Input Module**
- Standard input module with 2 Dual Channel Safety Inputs for connection of switches, 2 monitoring outputs, diagnostic LED’s and MODUS bus connection.
- Outputs for establishing Safety Groups.
- Safety Category 4
- 2NC Safety Inputs (Dual NC/NC)
- 2 Semi-conductor Monitoring Outputs
- Short circuit and earth fault monitoring Diagnostic LED’s
- Output Group Connection
- Only in combination with Basic Module MM-1 MODUS Bus connection

**IPM3 Input Module**
- Input module with 3 Dual Channel Safety Inputs for connection of switches, 3 monitoring outputs and diagnostic LED’s.
- Safety Category 4
- 3NC Safety Inputs (Dual NC/NC)
- 3 Semi-conductor Monitoring Outputs
- Short circuit and earth fault monitoring Diagnostic LED’s
- Only in combination with Basic Module MM-1 MODUS Bus connection

**OPM4 Output Module**
- Standard output module with 3NC 1NO Safety Relay Outputs.
- Only in combination with Basic Module MM-1 MODUS Bus connection
- Stop Category: 0
- Safety Category: 4
- 3NC 1NO Relay Outputs
- Diagnostic LED’s
- Relay Outputs: 250V ac 8A. AC12
- 24V dc 3A. DC13

**OPM4D Output Module**
- Output module with 4 Delayed Safety Relay 2
- 1 Semi-conductor Monitoring Output
- Only in combination with Basic Module MM-1 MODUS Bus connection
- Stop Category: 1
- Safety Category: 4
- 4NC Relay Outputs – Delayed – variable 1-30s,
- Diagnostic LED’s
- Relay Outputs: 250V ac 8A. AC12
- 24V dc 3A. DC13

<table>
<thead>
<tr>
<th>Sales Number</th>
<th>Type</th>
<th>Supply Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>181001</td>
<td>MM-1 Basic Module</td>
<td>24V dc</td>
</tr>
<tr>
<td>181002</td>
<td>IPM2G Input Module</td>
<td>MODUS</td>
</tr>
<tr>
<td>181003</td>
<td>IPM3 Input Module</td>
<td>MODUS</td>
</tr>
<tr>
<td>181010</td>
<td>OPM4 Output Module</td>
<td>MODUS</td>
</tr>
<tr>
<td>181011</td>
<td>OPM4D Output Module</td>
<td>MODUS</td>
</tr>
</tbody>
</table>

MODUS is still growing for details
contact sales@idemsafety.com
Modus - Plug and Expand Safety Control Modules for Safety Switches

Expandable Safety Modules for use with Interlock Switches and Rope Switches

- Pluggable and expandable Modules - 35mm rail pluggable system
- Satisfy up to EN 954-1 Cat.4
- SIL 3 EN61508
- Up to PLe ISO13849-1
- Dual channel NC inputs for use with all Safety Interlock Switches
- Compact 22mm enclosures - DIN rail mounting
- Add Switch Input Modules easily – no programming
- Add Output Switching Modules easily – no programming
- Manage Machine Stop hierarchy by grouping inputs
- High operational life
- Monitored or Auto reset
- LED diagnostics
- Time delayed output Module

For monitoring an installation by PC, PLC or Text Display, an RS485 interface is integrated within the Modus system.

The MODUS ‘Plug and Expand’ relay system is ideal for the prevention of dangerous states at small, medium and large installations.

For these applications you often have to consider various requirements and tasks regarding the safety function. If several emergency stop or interlock switches simultaneously have to be supervised some parts of the machine may have to stop immediately while others have to stop with delay. In a few cases of danger you have to stop only one part of the installation while the other functions can continue.

The solution for all these applications is MODUS, the modular Plug & Play Safety System.

The Master Module itself is a complete safety monitoring relay with 2 dual-channel input contacts and 3 force guided safety output contacts, like a traditional Safety Relay.

Later individual expansion is possible at anytime by adding (plugging) either additional input modules (for connection of extra switches) or additional output modules (for the addition of output switching circuits).

Modus grows according to your installation - just insert a new input or output module and the installation runs.

The system is self-configuring with no programming and the highest safety category PLe ISO13849-1 and SIL3 EN61508 is maintained at all times.

Input Modules can be grouped to enable designated sub-sections of the machine safety function to be shut off e.g.

Group 1 E-Stops (Rope switches) Power off all Drives
Group 2 Tongue switches Power off Drives in Group 2 Guard area only
Group 3 Non Contact switches Power off Drives in Group 3 Guard area only

The modules communicate with each other via a bus connection within the 35mm DIN-rail.

The system can be integrated with a PLC or Computer by a serial communication interface which offers perfect diagnostic and fault detection.

All you have to learn:

1. Plug switch input modules to the left of the Base module.
2. Plug relay output modules to the right of the Base module.
3. If desired specify the end of a group with connection cable.
4. Configuration is automatic.
Applications: Expandable Safety Modules for use with Interlock Switches and Rope Switches

A. Monitoring of 3 guard doors and 2 emergency stop buttons, interruption of 3 drives.

- **Press with 2 Guard Doors**
  - KM Tongue Switch
  - SPC Coded Non Contact Switch

- **Conveyor**
  - GLS Rope - E Stop Switch

- **Motor with 1 Guard Door**
  - GLES - E Stop Switch
  - KP Tongue Switch

Installation comprising of a Press, Conveyor and Motor is protected by 3 guard doors and 2 Emergency Stop devices.

Safety Interlocking and E Stop functions are provided by:

- KM Tongue Interlock Switch
- SPC Coded Non Contact Interlock Switch
- GLS E Stop Switch
- KP Tongue Interlock Switch
- GLES E Stop switch
- MODUS MM-1 IPM3 OPM4

B. Monitoring of 2 guard doors and 3 emergency stop buttons, interruption of 3 drives, grouping in 2 groups with higher-level stop switch

The Press and the Conveyor belong to Group 1 and the Motor to Group 2. Each Group has its own basic module, to which the necessary input and output modules are adjoined.

Operating either the E Stop on the Press or the Conveyor Rope Pull causes the stop of the drives of Group 1, while the Motor behind the right guard door will still be running.

Operating the E Stop on the Motor will cause stopping of the Motor, but both drives of Group 1 will still be running.

However opening either door interlock switch will stop all drives.