EsMatix 3
Safety switching device for sensors with 8,2 kΩ

Translation of the original instructions

General

1 Safety Instructions

- Read these operating instructions thoroughly before putting the device into operation and keep them for future reference.
- Do not use this product other than for its specified application.
- Only trained and qualified personnel may install and initialize the device.
- Only authorized factory personnel may perform hardware/software changes or repairs to the product.
- Pay attention to all local relevant electrical safety regulations!
- Failure to follow these safety precautions may cause damage to device or objects, serious personal injury, or death.
- It is the responsibility of the equipment installer to carry out a risk assessment and to install the system, in compliance with applicable local, national and international regulations, safety standards, codes and laws as well as the Machinery Directive 2006/42/EC, should this apply.
- Observe all applicable local, national, and international door safety standards, codes, and laws.
- Always consider the safety functions of your applications as a whole, never just in relation to one individual section of the system.
- The installer is responsible for testing the system to ensure it meets all applicable safety standards.
- During the operation of electrical components — e.g. in the case of a short circuit hot and ionised gases can be emitted; protection covers must not be removed!
- The device should only be operated from a safety extra low voltage (SELV) system with safe electrical separation according to EN 61558.
- The wiring must be protected against mechanical damage.

Prior to starting installation or mounting, take the following safety precautions:

- Check the voltage data on the label of the switching device.
- Ensure that the device/installations cannot be switched on!
- Ensure that the power supply is disconnected!
- Protect the device with a housing against contamination or harsh environments!
- Cover any neighbouring live parts or remove them!
- Disconnect device from mains in the event of a fault.
- Avoid touching any electronic components.
- Limited protection against accidental contact!

2 Intended use

The EsMatix 3 switching devices are used to monitor pressure-sensitive pressure-sensitive protective devices of the manufacturer (for safety mats according to EN ISO 13856-1, for safety edges according to EN ISO 13856-2). They comply with the requirements of the standard EN ISO 13849-1 for protective devices up to PL e, Cat. 3.

If the safety device is not requested operationally at least once a month, it must be checked automatically or manually by the operator at least once a month.

The device can be installed in a simple, industrial or even controlled electromagnetic environment.

Common Applications
**3 Function**

Connected sensors with a terminating resistor of 8.2 kΩ are monitored for a change in current. In the idle mode:
- all safety outputs are conductive
- the LED lights up green
- current reset-function appears on the display

When one or more sensors are actuated:
- the total resistance of the sensor system drops to zero Ωs
- the defined switching threshold is not reached anymore
- both output relays “Safety” open
- the LED lights up orange, P appears on the display

In the event of a fault in the sensor circuit (for example cable breakage):
- the total resistance of the sensor system increases
- the defined switching threshold is exceeded
- both output relays “Safety” open
- the LED lights up red, E appears on the display

**Reset (Acknowledgment) of the switching device is carried out:**
Depending on the configuration:
- By pressing and releasing the “data” button
- Automatically
- By applying and removing again an external reset signal to T1-T2

The recovery time after reset is < 30 ms (< 0.5 sec after a fault), then the LED lights green

**Block diagram**

**4 Connections, Settings**

Examples: Wiring with autoreset

Wiring with external reset and EDM (external device monitoring)

**5 Configuration and set-up**

**5.1 Terminals**

*Wiring the device*

- A1 / A2: Supply voltage (24 VDC or 24 VAC) ▲
- 1 / 2: Sensor 1
- 3 / 4: Sensor 2
- 11 / 14: Safety Relay 1 ▲
- 21 / 24: Safety Relay 2 ▲
- 5 / 6: Status output
- T1 / T2: Reset

**Switch on supply voltage**

*If necessary, configure the device*

**5.2 Function test**

*Function test*

- Press sensor 1, check LED (orange), display (P, ①, ②, 1). Check if both outputs are open.
- Release sensor
- Manually reset device at reset type external (Et): close and reopen contact or at reset type internal (but): press and release button “Data”
- If present, press sensor 2, check LED, display (P, ①, ③, 2). Check if both outputs are open.
- Release sensor
- Manually reset device at reset type external (Et): close and reopen contact or at reset type internal (but): press and release button “Data”

After successful testing, the system is ready for operation.
Display: A and two flashing dots

In operation with external relays, freewheeling diodes are mandatory.
5.3 Diagnostic menu (read only)
Enter Diagnostic menu:
Press "Mode" and "Data" buttons simultaneously for 2 seconds
→ Status LED flashes orange
To see the next parameter, press "Mode", Data query (Mode E and r):
press "Data"
Exit Diagnostic menu:
Press "Mode" button for 2 seconds

5.4 Configuration mode (edit mode)
Enter Diagnostic menu:
Press "Mode" and "Data" buttons simultaneously for 2 seconds
→ Status LED flashes orange
To see the next parameter, press "Mode", Data query (Mode E and r):
press "Data"
Exit Diagnostic menu:
Press "Mode" button for 2 seconds

On initial commissioning, the device must be adapted (configured)
to the application.
Enter Configuration menu:
• Enter diagnostic menu: Press "Mode" and "Data" buttons simultaneously
  for 2 seconds.
• Press "Mode" repeatedly until "C" and "con" are displayed.
• Press "Data" button, "con" starts flashing.
• Press "Mode" and "Data" buttons simultaneously until "con" stops
  flashing. Green LED starts flashing fast.
• Release "Mode" and "Data", "C" starts flashing, both safety relays open.
Configuration
• Press the "Mode" button to select the requested parameter.
• Press the "Data" button to set the value.
Exit Configuration menu: Press "Mode" for 2 seconds.

Table 1: Status output

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Type</th>
<th>Unpowered (LED off)</th>
<th>Sensor idle (LED green)</th>
<th>Sensor actuated (LED orange)</th>
<th>Fault (LED red)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC (Fault contact)</td>
<td>EsMatix 3</td>
<td>OPEN</td>
<td>closed</td>
<td>closed</td>
<td>OPEN</td>
</tr>
<tr>
<td>SC (Signaling contact)</td>
<td>EsMatix 3</td>
<td>OPEN</td>
<td>closed</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
<tr>
<td>Safety contacts</td>
<td>all types</td>
<td>OPEN</td>
<td>closed</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>
### 5.5 Service mode

- **Enter Service mode:** Press “Data” for 10 seconds
  → Green status LED flashes
  To enter the next mode, press “Mode”
  Data query in each mode: press “Data” button
- **Exit Service mode:** Press “Mode” button for 2 seconds

In the service mode, further information can be queried:

- **H** Hardware Version
- **S** Software Version
- **t** Type (Cat. acc. to EN ISO 13849-1)
- **U** Internal supply voltage
- **o** Current chip temperature
- **E** The last five error messages (displayed by pressing “Data” button)
- **rES** press and hold “Data” button until --- is displayed to reset the memory of the error messages

Should other fault messages appear, please contact your supplier.

### 5.6 Error displays

<table>
<thead>
<tr>
<th>Display</th>
<th>E001</th>
<th>E002</th>
<th>E006</th>
<th>E007</th>
<th>E008</th>
<th>E009</th>
<th>E101</th>
<th>E102</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>Sensor 1 wiring defective</td>
<td>Sensor 2 wiring defective</td>
<td>Configuration mode incorrectly set</td>
<td>Outputs not OK</td>
<td>Under-voltage</td>
<td>Overvoltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remedy</td>
<td>Check sensor 1</td>
<td>Check sensor 2</td>
<td>Check configuration</td>
<td>Check connection for outputs</td>
<td>Check supply</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Should other fault messages appear, please contact your supplier.

### 6 Technical Data

- **Supply voltage:** 24 V AC –20% to +10%, 50/60 Hz 24 V DC –20% to +20%
- **Power consumption:** max. 3 W
- **Inputs Sensors:** for Sensors with 8,2 kΩ termination
- **Input Reset:** 24 V AC/DC, max. 3 mA@24 V Uth > 8 V DC
- **Safety relays:** Solid state relays, 24 V DC, min. 0.5 mA, max. 250 mA, RDS(on) < 2 Ω, internally protected by a 300 mA fuse
- **Status output:** Solid state relays, 24 V AC/DC, max. 250 mA, RDS(on) < 2 Ω
- **Reaction time (at activation):** < 5 ms
- **Recovery time:** < 30 ms (reset after activation)
- **Start-up time:** < 300 ms
- **External reset pulse (required):** > 100 ms
- **Housing:** Polyamide grey / red
- **Dimensions:** 22.5 × 92 × 85 mm (W x H x D)
- **Mounting:** Direct DIN-rail mounting
- **Terminals:** Pluggable screw terminals
- **Protection class:** IP20
- **Operating temperature:** –20°C to +60°C
- **Storage temperature:** –40°C to +70°C
- **Humidity:** Max. 95% relative, non-condensing

### 7 EU Declaration of Conformity

See attachment

### 8 WEEE

Devices with this symbol must be treated separately during disposal. This must be done in accordance with the laws of the respective countries for environmentally sound disposal, processing and recycling of electrical and electronic equipment.

### 8 Contact

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Designed in Switzerland / Made in Bulgaria