SWISSDOOR
DØRTEKNIK FOR PROFESSIONELLE

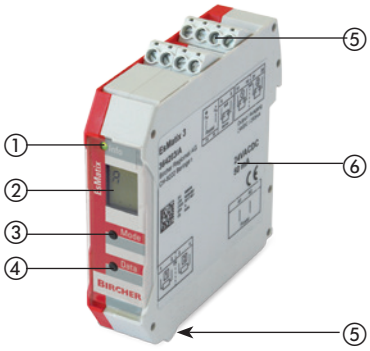
BIRCHER

EsMatix 3

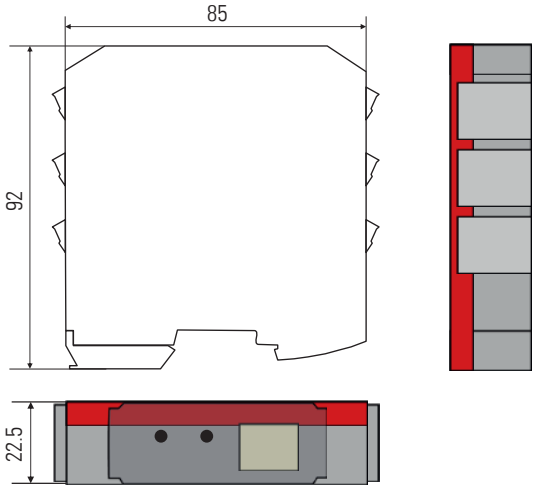
Safety switching device for sensors with 8,2 kOhm

Original instructions

General



① LED
② LCD display
③ "Mode" button
④ "Data" button
⑤ Connecting terminals
⑥ Label



1 Safety Instructions

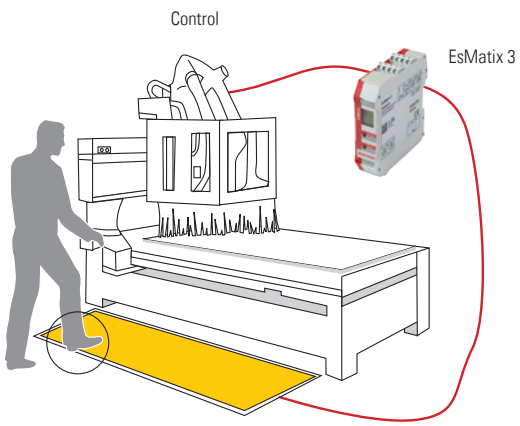
- The assembly, commissioning, modifications and extensions may only be completed by an experienced electrician!
- Before commencing work, remove the power supply from the device/ installations!
- During the operation of electrical components
  – e. g. in the case of a short circuit hot and ionised gases can be emitted
  – protection covers must not to be removed!
- Pay attention to all local relevant electrical safety regulations!
- Disregard of the safety regulations can cause death, severe injuries or extensive damage!
- Keep the these operating instructions in a safe place for later use!

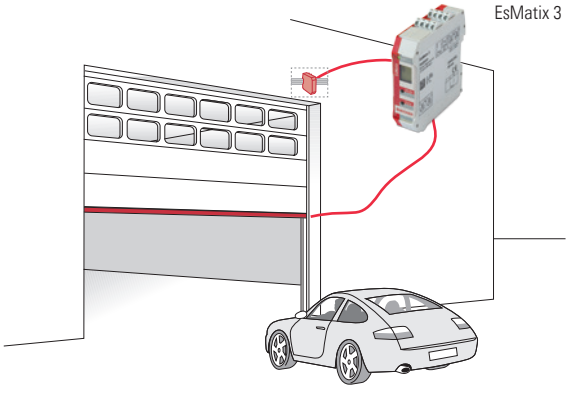
Before commencing the installation or assembly complete the following safety precautions:

- Check the voltage data on the type plate of the switching device.
- Ensure that the device/installations can not be switched on!
- Determine that the power supply is disconnected!
- Ground the phases and short circuit!
- Separate or cover neighbouring components which are connected to the power supply!
- Cover the device during assembly!
  Foreign particles (e.g. borings from drilling) can the damage the device.
- Protect the device with a housing against contamination or aggressive environments!

Limited protection against accidental contact!

2 Common Application





3 Function

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

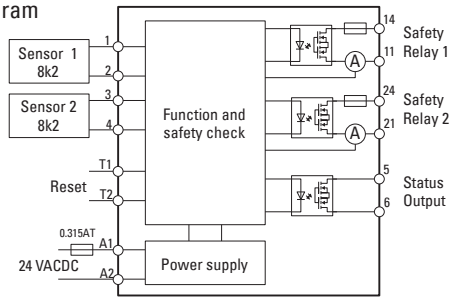
When one or more sensors are **actuated**
- the total resistance of the sensor system drops to zero ohms
- the defined switching threshold is not reached anymore
- the output relays "Safety" open
- the LED lights up orange, P appears on the display

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
- the 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

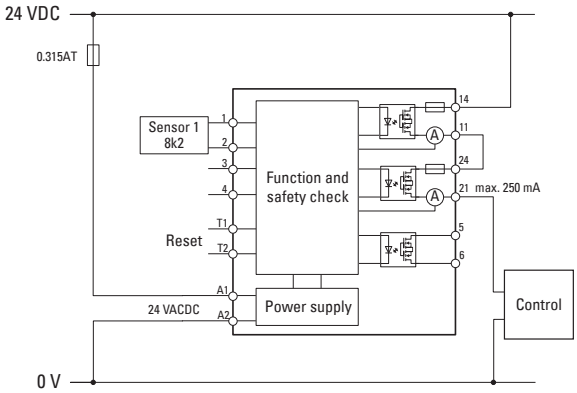
The recovery time after reset is < 30 ms (< 0.5 sec after a fault), then the LED lights green

Block diagram

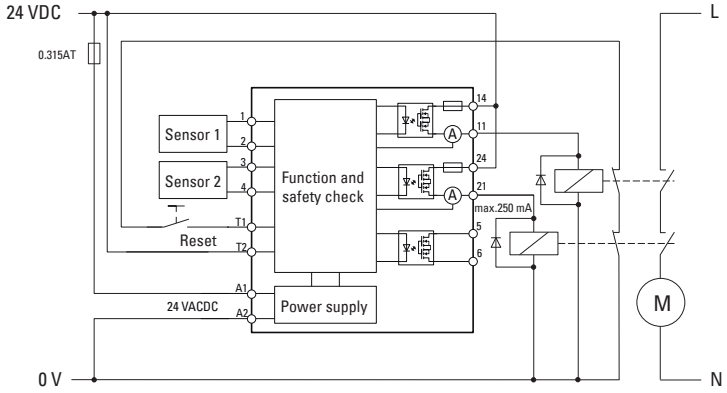


4 Connections, Settings

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

ⓘ No function test possible without connected outputs (Display E 007)
▲ Wiring mandatory

Switch on supply voltage
If necessary, configure the device

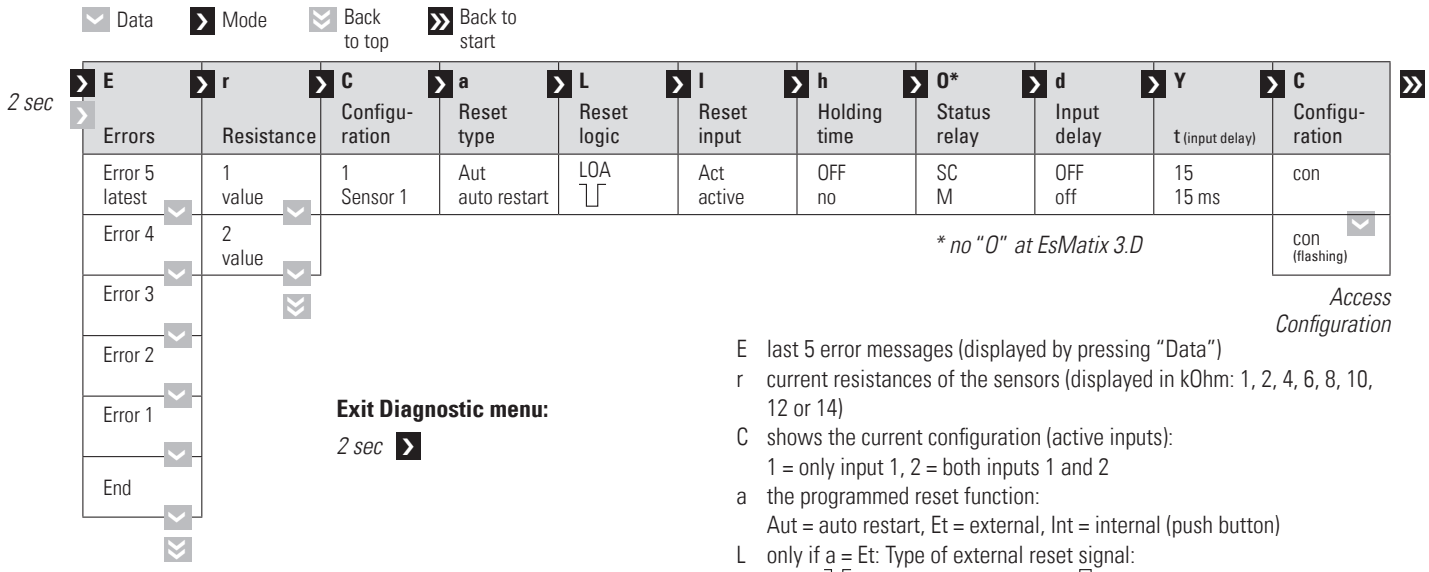
5.2 Function test

Function test

- Press sensor 1, check LED (orange), display (P, ①, ②, 1) and output
- Release sensor
- Manually reset device at reset type external (Et): close and reopen contact or at reset type internal (Int): press and release button "Data"
- If present, press sensor 2, check LED, display (P, ①, ②, 2) and output
- Release sensor
- Manually reset device at reset type external (Et): close and reopen contact or at reset type internal (Int): press and release button "Data"

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

5.3 **Diagnostic menu** (read only)



Exit Diagnostic menu:

2 sec ›

Enter Diagnostic menu:

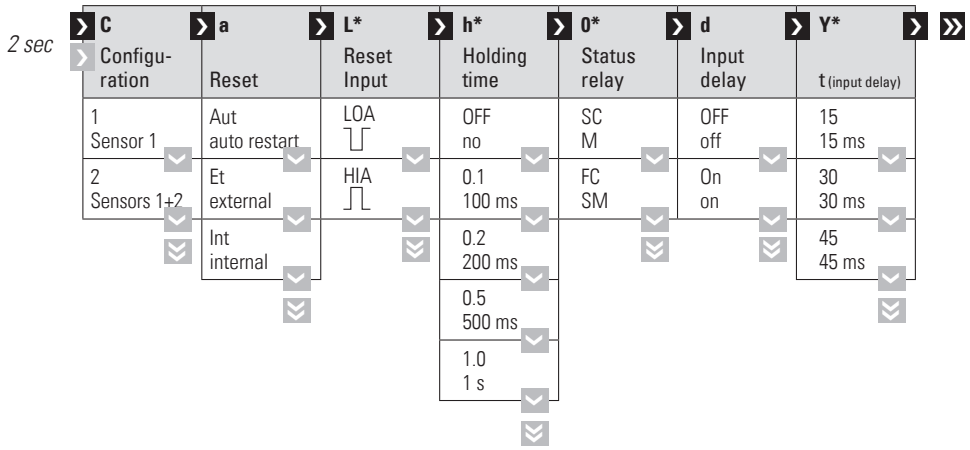
Press "Mode" and "Data" buttons simultaneously for 2 seconds
→ Status LED flashes orange
To see the next parameter, press "Mode", Data query (Mode E and r): press "Data"

Exit Diagnostic menu:

› Press "Mode" button for 2 seconds

- E last 5 error messages (displayed by pressing "Data")
- r current resistances of the sensors (displayed in kOhm: 1, 2, 4, 6, 8, 10, 12 or 14)
- C shows the current configuration (active inputs): 1 = only input 1, 2 = both inputs 1 and 2
- a the programmed reset function: Aut = auto restart, Et = external, Int = internal (push button)
- L only if a = Et: Type of external reset signal: LOA = ⎍ (pulse low active), HIA = ⎍ (pulse high active)
- I only if a = Et: status of the applied reset signal: Act = active, IdL = inactive
- h only if a = Aut: The holding time (extension of the output signal): OFF = no, 0.1 = 100 ms, 0.2 = 200 ms, 0.5 = 500 ms, 1.0 = 1 s
- O only at EsMatix 3: type of the status output: Signaling contact = M, Fault contact = SM (see table 5.4)
- d Input on delay: OFF = off, On = on
- Y only if d = On: Input on delay time: 15 = 15 ms, 30 = 30 ms, 45 = 45 ms
- C configuration: entering into the configuration mode by pressing "data"→ Chap. 5.4

5.4 **Configuration mode** (edit mode)



** no "O" at EsMatix 3.D*
"L" only at "a" = Et
"h" only at "a" = Aut
"Y" only at "d" = On

Exit Configuration menu:

2 sec ›

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.

Adjustable parameters:

- C active inputs: 1 = only input 1, 2 = both inputs 1 and 2
- a type of reset: Aut = auto restart, Et = external, Int = internal (push button)
- L only if a = Et: Type of external reset signal: LOA = ⎍ (pulse low active), HIA = ⎍ (pulse high active)
- h only if a = Aut: The holding time (extension of the output signal): OFF = no, 0.1 = 100 ms, 0.2 = 200 ms, 0.5 = 500 ms, 1.0 = 1 s
- O only at EsMatix 3: type of the status output: Signaling contact = M, Fault contact = SM → table below
- d Input on delay: OFF = off, On = on
- Y only if d = On: Input on delay time: 15 = 15 ms, 30 = 30 ms, 45 = 45 ms

Status Relays

Contacts	Type	Unpowered (LED off)	Sensor idle (LED green)	Sensor actuated (LED orange)	Fault (LED red)
SM (Fault contact)	EsMatix 3	OPEN	closed	closed	OPEN
M (Signaling contact)	EsMatix 3	OPEN	closed	OPEN	OPEN
D (Signaling contact)	EsMatix 3.D	closed	OPEN	closed	closed
Safety contacts	all types	OPEN	closed	OPEN	OPEN

5.5 Service mode

Data | Mode | Back to top | Back to start

10 sec ›

H	S	t	U	o	E	E
Hardware version	Software version	Type	Supply voltage	Chip temperature	Errors flash	Errors flash
005	6.52	3	value	value	Error 5 latest	rES
					Error 4	---
					Error 3	
					Error 2	
					Error 1	
					End	

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")
E rES: press and hold "Data" button until --- is displayed to reset the memory of the error messages

5.6 Error displays

If an error is detected both relays are deactivated and symbols ① & ② and an error code are displayed. The status LED lights up red.

Display	E001	E002	E006	E007	E008	E009	E101	E102
Error	Sensor 1 wiring defective	Sensor 2 wiring defective	Configuration mode incorrectly set	① Outputs not OK	②	① ②	Under-voltage	Overvoltage
Remedy	Check sensor 1	Check sensor 2	Check configuration	Check connection for outputs			Check supply	

Should other fault messages appear, please contact your supplier.

6 Technical Data

Supply voltage	24 VAC –20% to +10%; 24 VDC –20% to +20%
Power consumption	max. 3 VA
Inputs Sensors	for Sensors with 8,2 kOhm termination
Input Reset	24 VACDC
Safety relays	Solid state relays, 24 VDC, max. 250 mA internally protected by a 300 mA fuse
Status output	Solid state relays, 24 VACDC, max. 250 mA
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 x 94 x 88 mm (W x H x D)
Mounting	Direct DIN-rail mounting
Terminals	Pluggable screw terminals
Protection class	IP30
Operating temperature	–20°C to +60°C
Storage temperature	–40°C to +70°C
Humidity	< 95% non-condensing

7 EC-Declaration of Conformity

Manufacturer:	Bircher Reglomat AG, Wiesengasse 20, CH-8222 Beringen
Following directives have been observed:	MD 2006/42/EC, RoHS 2011/65/EU, EMC 2014/30/EU
EC type-examination certificate:	E 7142
Notified body:	Suva, Bereich Technik, SCESp 0008, Kenn-Nr.1246
Product variants:	EsMatix 3, EsMatix 3.D

8 Contact

Contact

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