TSRO-0824

Safe dry digital output FTA for SIL3 applications (8 channels)

Description

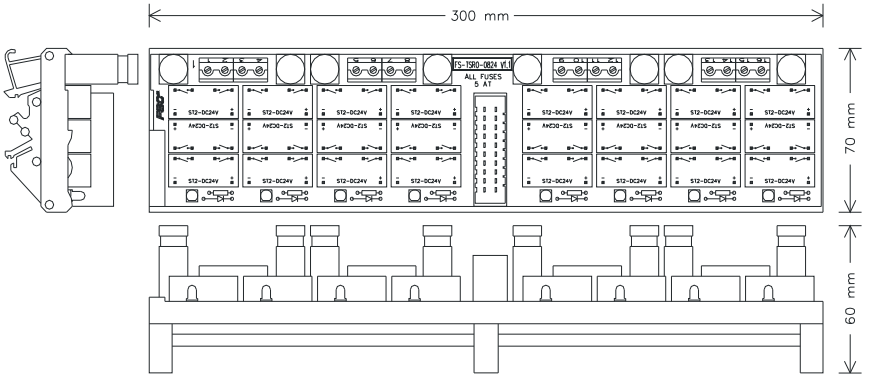
Field termination assembly module TSRO-0824 is the interface between system interconnection cable SICC-0001/Lx and the external field wiring (screw terminals). It has eight relay-based potential-free safe output channels suitable for applications up to and including SIL3 without the use of fault exclusions. TSRO-0824 complies with safety requirements for general use in safety requirement classes SIL3 as defined in IEC 61508.

The TSRO-0824 has floating, non commoned, output contacts that can be wired independently. Each output channel consists of:

- Three relays
- A fused NO field contact (5 AT, slow-acting)
- A status indication LED

The relays are capable of driving a wide variety of loads, including 115/230 Vac, which gives Safety Manager a 115/230 Vac output capability for SIL3 applications. The energized relay state is indicated by a LED on the module.

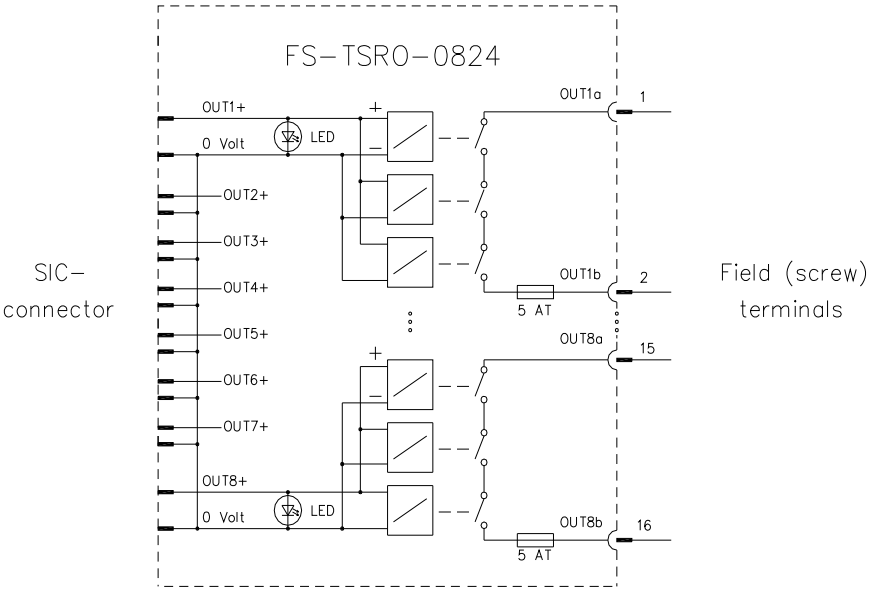
Figure 394 Mechanical layout



Eight channels can be connected to the TSRO-0824 module via system interconnection cable SICC-0001/Lx. This cable is plugged into the SIC connector on the FTA module, and connects to a (redundant pair of) SDO-0824 module(s).

The FTA module has a universal snap-in provision for standard DIN EN rails, and screw terminals for connecting field wiring.

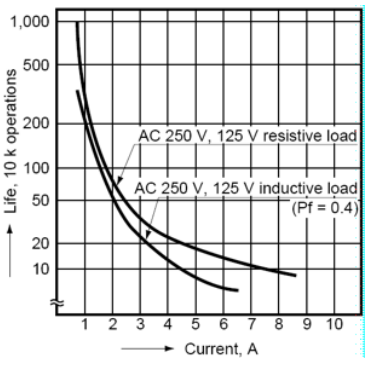
Figure 395 Schematic diagram



Relay life

The electrical life of the relays heavily depends on the contact rating the relay is exposed to. Figure 396 on page 642 shows the expected relay life versus contact current.

Figure 396 Life curve of the applied relays



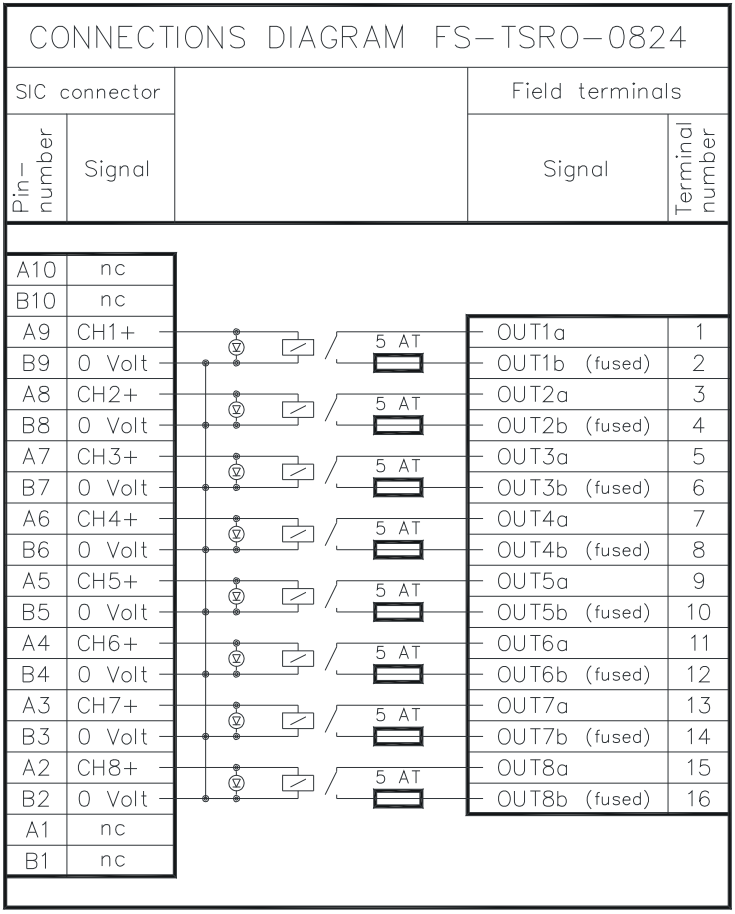
Applications

For details on applications and connection options for TSRO-0824, see “SICC-0001/Lx” on page 715.

Connections

The connections diagram of the TSRO-0824 module:

Figure 397 Connections diagram



Technical data

The TSRO-0824 module has the following specifications:

General	Type numbers[1] [2]:	FS-TSRO-0824 V1.1
		FC-TSRO-0824 V1.1
	Approvals:	CE, UL, TUV, CSA
	Safety class:	up to and including SIL3
Input	Nominal input voltage:	24 Vdc
	Max. input voltage:	36 Vdc
	Relay pick-up voltage:	19.2 Vdc
	Input current:	Typically 40 mA at 24 Vdc
Output	Number of output channels:	8
	Max. output current:	5 A (fused)
	Min. output current:	1 mA at 5 V
	Max. output voltage:	250 Vac / 250 Vdc
	Max. switched load:	1250 VA / 150 W (see Figure 398 on page 645)
Fuses	Rating:	5 AT (slow-acting)
	Dimensions:	5 × 20 mm (0.2 × 0.78 in)
Physical	Module dimensions:	300 × 70 × 60 mm (L × W × H) 11.81 × 2.76 × 2.36 in (L × W × H)
	DIN EN rails:	TS32 / TS35 × 7.5
	Used rail length:	301 mm (11.85 in)
Termination	Screw terminals:	
	• Max. wire diameter:	2.5 mm² (AWG 14)
	• Strip length:	7 mm (0.28 in)
	• Tightening torque	0.5 Nm (0.37 ft.-lb.)
Environment	Ambient temperature:	–5°C—+60°C (23°F—140°F)

Isolation	Isolation:	
	• Coil to contact	4000 Vac
	• Contact to contact	1200 Vac
Relay contact	Max. switching load:[3]	250 Vac, 5A 24 Vdc, 5A 48 Vdc, 1A 110 Vdc, 500 mA
	Max. switching frequency:	20 Hz
	Expected life:	See Figure 396 on page 642
	Contact material:	gold flash over silver alloy

1 FS-type modules are non conformal coated modules.
FC-type modules are conformal coated modules. Conformal coated modules have the letters "CC" preceding the version number.

2 Modules with suffix code V1.1 or CCV1.1 and higher have improved insulation. There are no functional changes.

3 When switching DC loads, only use resistive loads or inductive loads with spark suppression diodes

Figure 398 Maximum switched power