



- 2-channel
- LB/SC monitoring
- Suitable for monitoring of SIL3 circuits
- Error message in SIL2 and SIL3
- Monitors the test pulse of the Triconex Trident 3401 module

**24 V DC
KFD2-MDO-2**

Function

The KFD2-MDO-2 monitoring unit monitors up to two field circuits of the Trident 3401 digital output modules manufactured by Triconex. It is applied in parallel with the wiring of the channels to be monitored and issues one error message per channel if one of the following status exist:

- The load resistance (on the field side) is less than 10 Ω.
- The load resistance (on the field side) is greater than 2 kΩ.

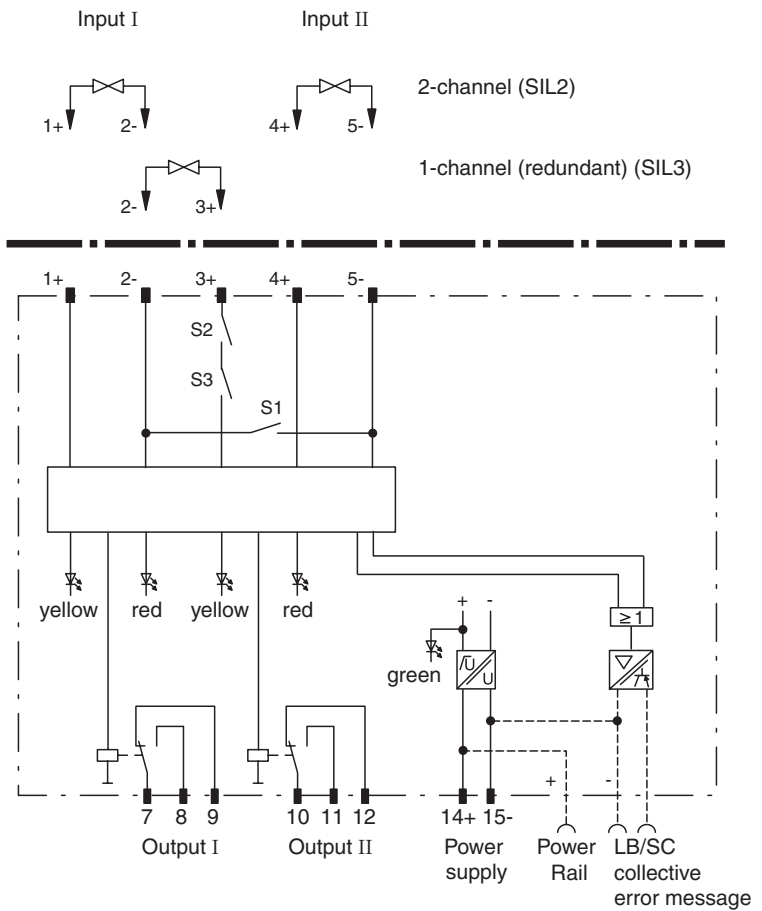
If the monitored field circuit fulfills functional safety purposes in accordance with IEC 61508, it is not influenced by the input circuit of the MDO module (up to SIL3). The field circuit monitoring and the forwarding of error messages are also implemented via integrated safety features. In dual-channel operating mode, SIL2 is achieved for each monitoring; in single-channel operating mode, one channel is monitored redundantly, thus achieving SIL3.

The error message is also issued if the KFD2-MDO-2 monitoring unit does not receive any test pulse from the Trident 3401 module for at least one second and half. (see last page)

Application

Particularly suitable for field circuit monitoring in combination with Triconex Trident 3401 modules, where field devices are not energised during the normal operation.

Connection



Composition

Front View

Housing type C (see system description)

LED yellow: Status channel I

LED red: Fault channel I

LED yellow: Status channel II

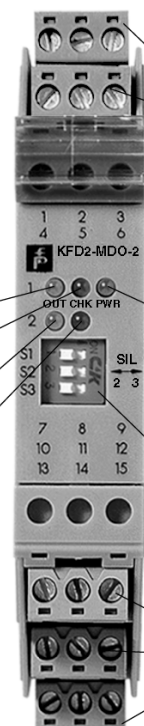
LED red: Fault channel II

Removable terminals green

LED green: Power supply

DIP switch
S1/S2/S3 open = 2-channel (SIL2)
S1/S2/S3 close = 1-channel (SIL3)

Removable terminals green



Supply	
Connection	Power Rail or terminals 14+, 15-
Rated voltage	20 ... 30 V DC
Ripple	± 15 %
Power loss	max. 1,3 W
Input	
Error detection	connection wires Trident module - KFD2-MDO-2: open circuit and short circuit detection by Trident test pulse watchdog field wires: open circuit and short circuit detection by the input signal (only in the OFF condition of the output signal of the Trident module)
Connection	2-channel for SIL2: ch1 terminals 1+, 2-; ch2 terminals 4+, 5- 1-channel (redundant) for SIL3: terminals 3+, 2-
Switching point/Switching hysteresis	lead short-circuit detection at < 10 Ω lead breakage detection at > 2 kΩ
Lead monitoring	test current < 2 mA (during the condition OFF of the Trident module)
Output	
Relay	outputs: - SPDT per channel with SIL2 application - SPST with SIL3 application function see table on the last page
Contact loading	253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load
Electrical isolation	
Input ch1/input ch2/power supply/collective error	function insulation, rated insulation voltage 50 V _{eff}
Output/power supply, inputs and collective error	reinforced insulation acc. to IEC 61140, rated insulation voltage 300 V _{eff}
Directive conformity	
Electromagnetic compatibility	
Directive 89/336/EC	EN 61326
Conformity	
Electromagnetic compatibility	NE 21
Protection degree	IEC 60529
Protection against electric shock	IEC 61140
Safety	IEC 61508/IEC 61511 safety integrity of the fault detection function: - SIL 2 at the single channel level - SIL 3 with two channels in parallel (redundant) interference of the monitored loop: - the interference is negligible to SIL3
Ambient conditions	
Ambient temperature	-20 ... 70 °C (253 ... 343 K)
Storage temperature	-40 ... 90 °C (233 ... 363 K)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 118 x 115 mm (0.8 x 4.6 x 4.5 in)

Supplementary information

Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see www.pepperl-fuchs.com.

Notes



Connections for 2 channels (SIL2)

1+ Input channel 1
2-
4+ Input channel 2
5-
9 Output channel 1 (SPDT)
7
8
12 Output channel 2 (SPDT)
10
11
14+ Power supply
15-

Connections for 1 channel (SIL3)

3+ Input
2-
7 Jumper
10
8 Output (SPST)
11
14+ Power supply
15-



Terminal assignment of field monitor KFD2-MDO-2

If an error is detected, the output relays de-energise. This reaction is safety-oriented. At the same time the error produces a central collective error message via the Power Rail. This reaction is **not** safety-oriented.

The field monitor KFD2-MDO-2 examines the field circuit and at the same time the presence of the test pulse of the Trident module.

Trident 3401 module	Field circuit	Relay	LED yellow	LED red
Signal output OFF	field circuit SC	de-energise	off	flash
	field circuit LB	de-energise	off	flash
	field circuit ok, test pulse is missing	de-energise	off	flash
	field circuit ok, test pulse ok	energise	on	off
Signal output ON	don't care	energise	on	off

Accessories

- Power Rail PR-03
- Power Rail UPR-03
- Power feed module KFD2-EB2...

By means of the Power Rail PR-03 or UPR-03 the devices can be provided with 24 V DC via the power feed module. If no Power Rails are used, power supply of the individual devices is realised directly via their device terminals.

Each power feed module is used for fusing and monitoring groups with up to 100 individual devices. The Power Rail PR-03 is an inset component for the DIN rail. The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 mm x 2000 mm. To make electrical contact, the devices are simply engaged.

The Power Rail must not be fed via the device terminals of the individual devices!