10310/2/1 Earth leakage detector (ELD)

Description

The 10310/2/1 module is an earth leakage detector (ELD) for 24 Vdc systems. It has a manually operated self-test and earth connection monitor (switch 2 in 'TEST' position).
The ELD can be used to monitor:

- 24 Vdc, 48 Vdc and/or 60 Vdc systems (see Figure 3), or
- 110 Vdc systems (see Figure 4).

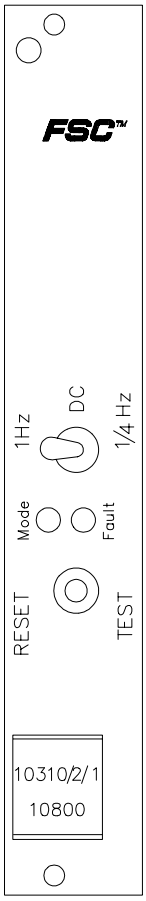


Figure 1 Front view

The ELD module connects earth level with –12 Vdc (referenced to the 0 V connection of the 24, 48, 60 and/or 110 Vdc supply). This connection is:

- continuous (switch 1 in 'DC' position), or
- interrupting at 1 Hz (switch 1 in '1 Hz' position), or
- interrupting at 0.25 Hz (switch 1 in '1/4 Hz' position).

With switch 1 in the '1 Hz' or '1/4 Hz' position, the green 'MODE' LED on the module front flashes at the selected connection frequency.

Switch 1 is normally used in the 'DC' position.
The '1 Hz' position should only be used to accommodate for solenoids or relays that could stay energized by the negative earth voltage.
The '1/4 Hz' position can be used for locating earth faults. Locating earth faults requires a current clamp (e.g. the C37 clamp from Chauvin Arnoux) and a voltmeter (200 mV AC range).

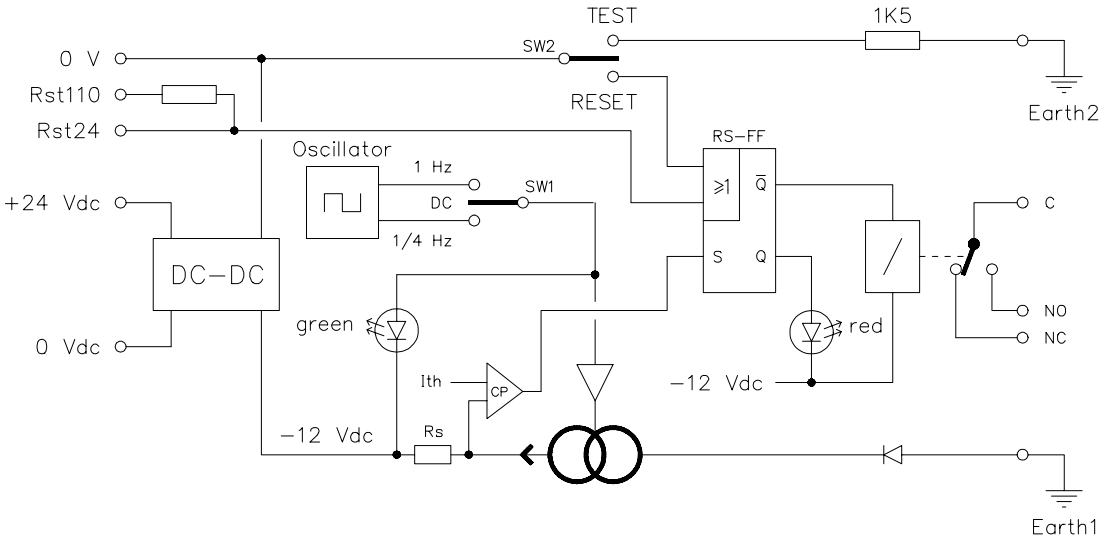


Figure 2 Block diagram of 10310/2/1 ELD

An earth fault sets the flip-flop (FF), and de-energizes the relay (see Figure 2). The flip-flop remains set until a reset is given. This can be done in three ways:

- manually (by setting switch 2 to 'RESET' position), or
- by a high level at the Rst24 input, or
- by a high level at the Rst110 input.

The ELD module can be tested by connecting a 1.5 kOhm resistor between 0 V and earth. This should set the flip-flop. A 1.5 kOhm resistor in the ELD with its own connection to earth (on the Earth2 pin) allows testing of the ELD and the earth connection (switch 2 in 'TEST' position). A disconnected Earth1-to-Earth2 link will block the flip-flop set action (because no earth current is flowing).

Connection examples

The figures below show two connection examples of the 10310/2/1 ELD module.

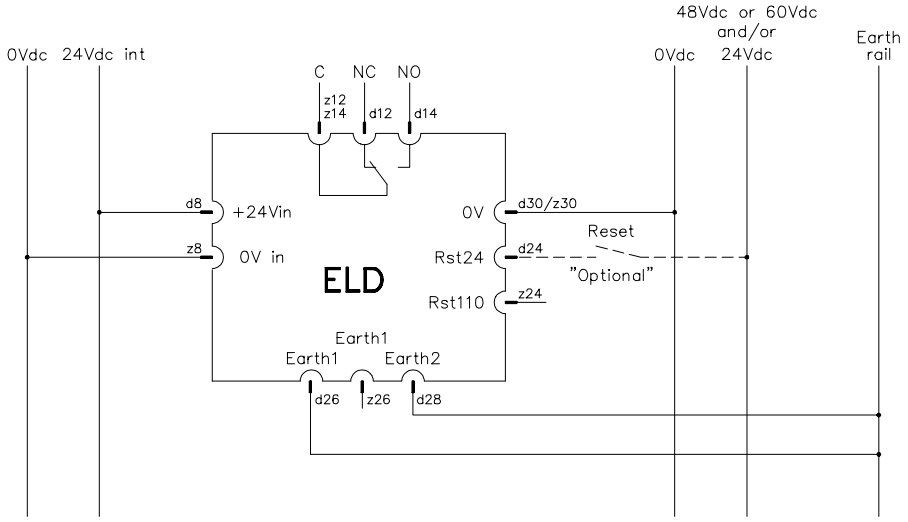


Figure 3 24 Vdc with 48 Vdc and/or 60 Vdc monitoring

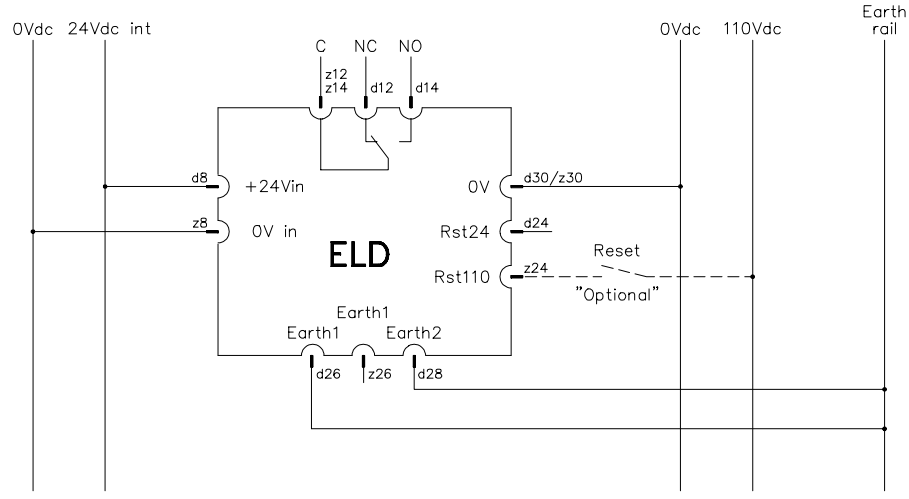
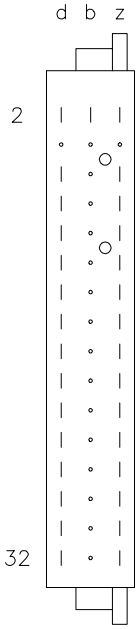


Figure 4 110 Vdc monitoring

Pin allocation

The back view and pin allocation of the 10310/2/1 module connector are as follows:



d2		b2		z2	
d4	–			z4	–
d6				z6	
d8	+24 Vin			z8	0 Vin
d10				z10	
d12	NC			z12	C
d14	NO			z14	C
d16				z16	
d18				z18	
d20				z20	
d22				z22	
d24	Rst24			z24	Rst110
d26	Earth 1			z26	Earth 1
d28	Earth 2			z28	
d30	0 V			z30	0 V
d32				z32	

Technical data

The 10310/2/1 module has the following specifications:

General

Type number:	10310/2/1 10800
Approvals:	CE, UL

Power

Supply voltage:	24 Vdc (max. 30 Vdc)
Supply current:	max. 60 mA
Rst24 input voltage:	18...70 Vdc
Rst110 input voltage:	40...130 Vdc
Rst24 input current:	1.1 mA at 24 Vdc
Rst110 input current:	2.5 mA at 110 Vdc

Earth

Earth voltage:	–12 Vdc (no earth fault) –30...+125 Vdc (earth fault)
Earth fault threshold:	5.5 mA (± 1 mA)
Max. earth current:	25.0 mA (± 5 mA)

Technical data (continued)

Output contact	Max. output voltage:	115 Vdc
	Max. output current:	2 A
Relay contacts	Initial contact resistance:	30 mOhm
	Max. current:	5 A
	Max. switched voltage:	250 Vdc / 250 Vac
	Max. switched load:	100 W / 1000 VA
	Expected life:	
	– electrical	100,000 switch operations
	– mechanical	200,000,000 switch operations
Key coding	(See 'Key coding' data sheet)	
	Module code:	
	– holes	A5, A11
	Rack code:	
	– large pins	A5, A11