D1092

SIL 3 Relay Output Module DIN-Rail Models D1092S, D1092D

Characteristics:

General Description:

The single and dual channel DIN Rail Relay Output, D1092S and D1092D are relay modules suitable for the switching of safety related circuits, up to SIL 3 level according to IEC61508:2010 Ed. 2, for high risk industries.
It provides isolation between input and output contacts.
D1092S provides 1 SPST contact for normally energized loads and 1 SPST contact for normally de-energized loads.
D1092D provides 2 SPST contact for normally energized loads and 2 SPST contact for normally de-energized loads.
When the relay is energized, the contacts are closed.
When the relay is de-energized, the contacts are open.
Compatibility with specific DO cards with pulse testing needs to be verified.
This relay module is not suitable for low-current consumption applications (system-to-system signalling, driving LEDs, etc.).

Function:

1 or 2 totally independent and isolated relay for safety related circuits, provides isolation between input and output.
D1092S: SIL 3 Safety Function for NE load (de-energized in safe state) is available at Terminal Blocks 1-2; in this case, the safety function is met when the relay is de-energized (open contact). SIL 3 Safety Function for ND load (energized in safe state) is available at Terminal Blocks 3-4; in this case, the safety function is met when the relay is energized (closed contact).
D1092D: SIL 3 Safety Function NE load (de-energized in safe state) is available at Terminal Blocks 1-2 and Terminal Blocks 5-6; in this case, the safety function is met when the relays are de-energized (open contact). SIL 3 Safety Function for ND load (energized in safe state) is available at Terminal Blocks 3-4 and Terminal Blocks 7-8; in this case the safety function is met when the relays are energized (closed contact).

Signalling LEDs:

Relay status (yellow).

EMC:

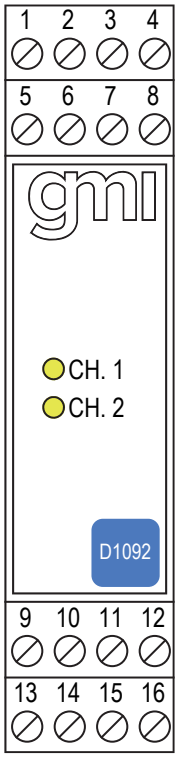
Fully compliant with CE marking applicable requirements.

Functional Safety Management certification:

G.M. International is certified by TUV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL3.

FSM SIL 3

Front Panel and Features:



- SIL 3 according to IEC 61508:2010 Ed. 2 for Tproof = 14 / 20 years (≤10% / >10 % of total SIF) with NE Load.
- SIL 3 according to IEC 61508:2010 Ed.2 for Tproof = 9 / 20 years (≤10% / >10 % of total SIF) with ND Load.
- PFDavg (1 year) 7.02 E-06, SFF 99.03 % with NE Load.
- PFDavg (1 year) 1.03 E-05, SFF 97.61 % with ND Load.
- SIL 3 Systematic capability.
- Installation in Zone 2, Division 2.
- 2 fully independent channels.
- 1 SPST contact for NE load and 1 SPST contact for ND load for each channel.
- 5 A inrush current at 30 Vdc / 250 Vac.
- Input/Output isolation.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1.
- ATEX, IECEx, FM & FM-C, TÜV Certifications.
- Type Approval Certificate DNV and KR for maritime applications.
- TUV Functional Safety Certification.
- High Reliability, SMD components.
- High Density, two channels per unit.
- Simplified installation using standard DIN Rail and plug-in terminal blocks.

Ordering Information:

Model:	D1092	
1 channel		S
2 channels		D

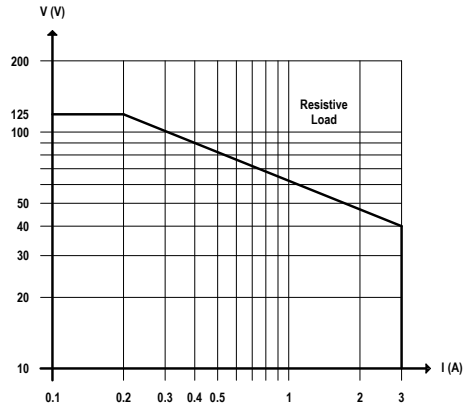
DIN-Rail accessories:
DIN rail stopper MOR016

Technical Data:

Input: 24 Vdc nom (20.4 to 27.6 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.
Current consumption @ 24 V: 50 mA for each channel with relay energized, typical (100 mA for 2 channels D1092D when used as duplicator 1 input / 2 outputs).
Power dissipation: 1.2 W for each channel with 24 V input voltage and relay energized, typical (2.4 W for 2 channels D1092D when used as duplicator).
Max. power consumption: at 27.6 V input voltage and relay energized, 1.5 W for each channel (3.0 W for 2 channels D1092D when used as duplicator).

Isolation (Test Voltage): Input/Output 2.5 KV; Input/Input 500 V; Output/Output 2.5 KV; Output A/Output B 1.5 KV.

Output: voltage free DPST relay contact, normally open.
Contact material: Ag Alloy (Cd free).
Contact rating: 3 A 250 Vac 750 VA, 3 A 125 Vdc 120 W (resistive load).
Contact inrush current: 5 A at 30 Vdc, 250 Vac.
Contact min. switching current: 10 mA.
DC Load breaking capacity:



Mechanical / Electrical life: 50 * 10^6 / 1 * 10^5 operation, typical.
Operate / Release time: 5 / 3 ms typical.
Bounce time NO / NC contact: 3 ms.
Frequency response: 10 Hz maximum.

Compatibility:
CE mark compliant, conforms to Directive: 2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:
Operating: temperature limits -20 to + 60 °C, relative humidity max 95 %.
Storage: temperature limits -45 to + 80 °C.

Safety Description:
ATEX: II 3G Ex ec nC IIC T4 Gc
IECEx: Ex ec nC IIC T4 Gc
FM: NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4
FM-C: NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4
non-incendive electrical apparatus.
-20 °C ≤ Ta ≤ 60 °C.
Approvals:
IMQ 09 ATEX 013 X conforms to EN60079-0, EN60079-7, EN60079-15.
IECEx IMQ 13.0011X conforms to IEC60079-0, IEC60079-7, IEC60079-15.
FM & FM-C No. 3024643, 3029921C, conforms to Class 3600, 3611, 3810. ANSI/ISA 12.12.02, ANSI/ISA 60079-0, C22.2 No.142, C22.2 No.213, E60079-0, E60079-15,
TÜV Certificate No. TUV IT 25 SIL 0632 , SIL 3 conforms to IEC61508:2010 Ed.2.
SIL 3 Functional Safety TÜV Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.
DNV No. TAA00002BM and KR No.MIL20769-EL001 Cert. for maritime applications.

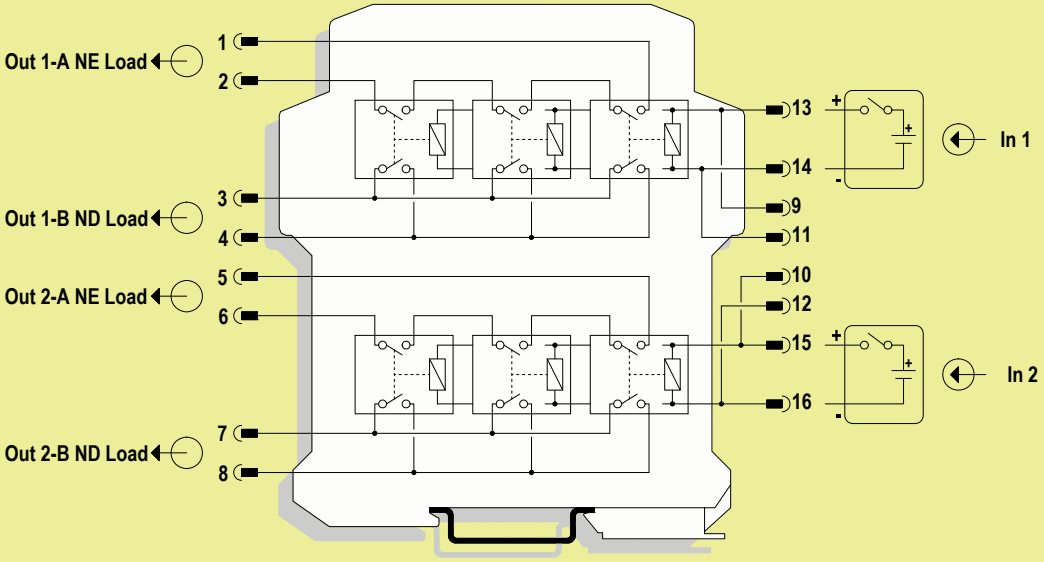
Mounting: EN/IEC60715 TH 35 DIN-Rail.
Weight: about 145 g D1092D, 110 g D1092S.
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2.
Location: Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4, Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.
Protection class: IP 20.
Dimensions: Width 22.5 mm, Depth 99 mm, Height 114.5 mm.

Image:

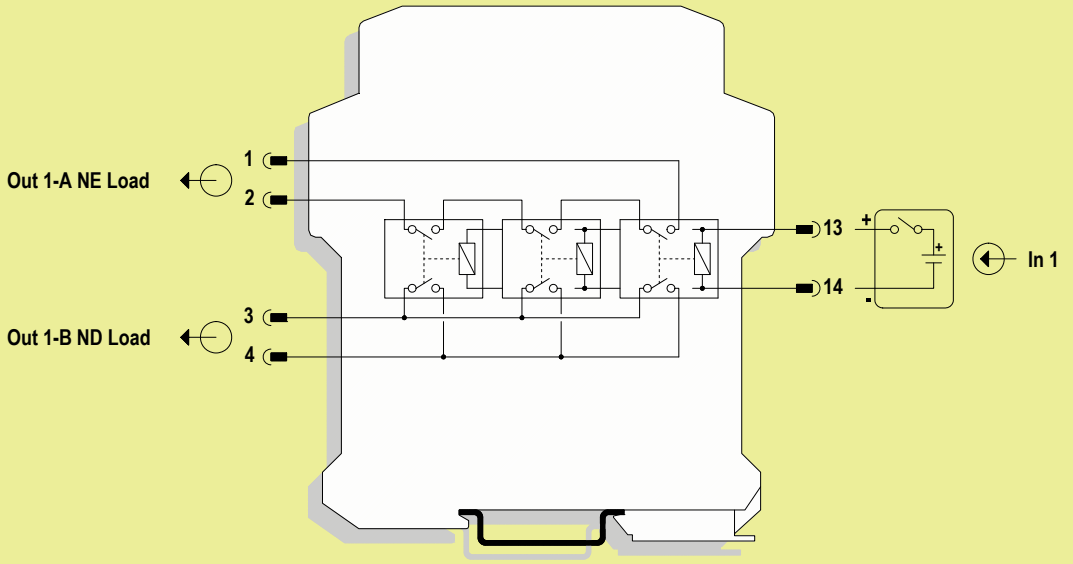
Function Diagram:

SAFE AREA, ZONE 2 GROUP IIC T4,
NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2, GROUPS A, B, C, D T-Code T4, CLASS I, ZONE 2, GROUP IIC T4

MODEL D1092D



MODEL D1092S

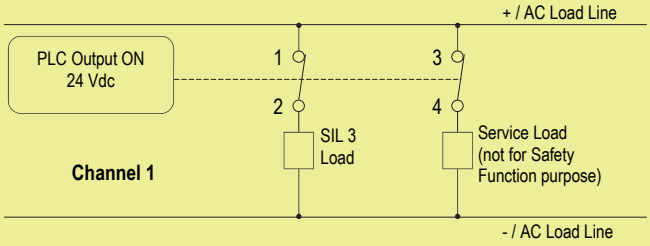


Relay contact shown in de-energized position

Functional Safety Applications:

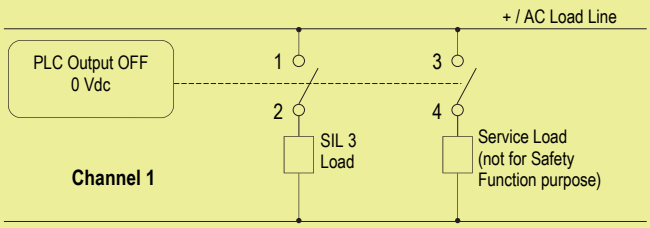
Application for D1092S - Normally Energized relay condition for NE Load

Normal state operation for D1092S



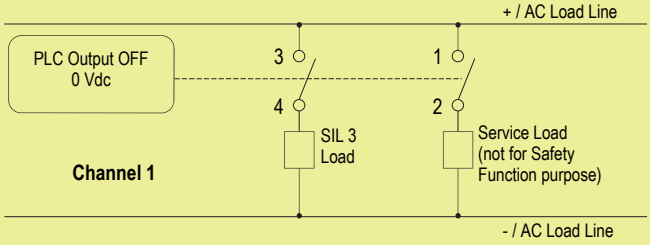
Contacts 1-2: in normal operation the relay is energized, contact is closed, SIL 3 load is energized.
Contacts 3-4: in normal operation the relay is energized, contact is closed, Service load (not for Safety Function purpose) is energized.

De-energized to trip operation for D1092S

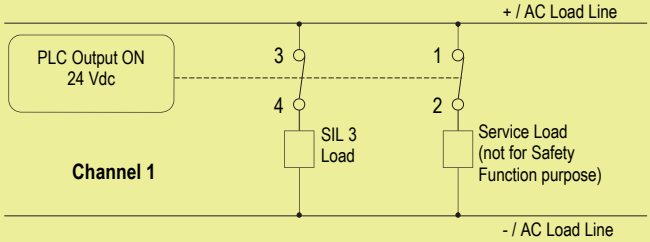


Contacts 1-2: the SIL 3 Safety Function is met when the relay is de-energized, contact is open, SIL 3 load is de-energized.
Contacts 3-4: opening of this contact can be used to monitor contacts 1-2. Service load (not for Safety Function purpose) is de-energized.

Application for D1092S - Normally De-energized relay condition for ND Load



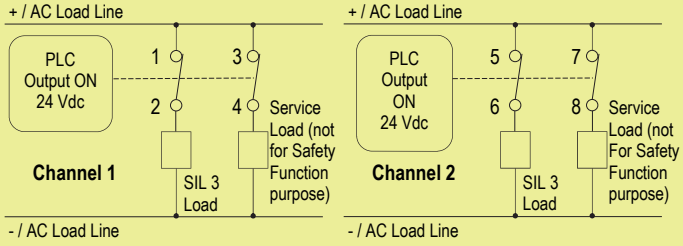
Contacts 1-2: in normal operation the relay is de-energized, contact is open, Service Load load (not for Safety Function purpose) is de-energized.
Contacts 3-4: in normal operation the relay is de-energized, contact is open, SIL 3 load is de-energized.



Contacts 1-2: closing of this contact can be used to monitor contacts 3 - 4. Service load (not for Safety Function purpose) is energized
Contacts 3-4: the SIL 3 Safety Function is met when the relay is energized, contact is closed, SIL 3 load is energized.

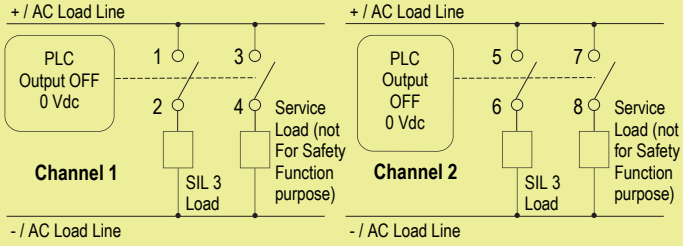
Application for D1092D - Normally Energized relay condition for NE Load

Normal state operation for D1092D



Contacts 1-2 and 5-6: in normal operation the relay is energized, contacts are closed, SIL 3 loads are energized.
Contacts 3-4 and 7-8: in normal operation the relay is energized, contacts are closed, Service loads (not for Safety Function purpose) are energized.

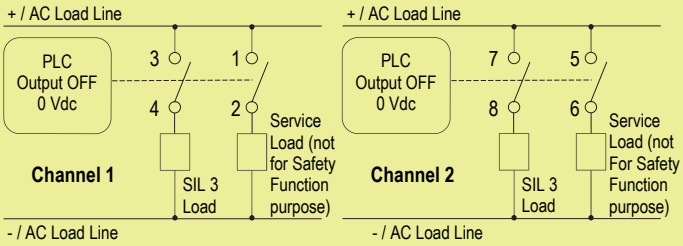
De-energized to trip operation D1092D



Contacts 1-2 and 5-6: the SIL 3 Safety Function is met when the relay is de-energized, contacts are open, SIL 3 loads are de-energized.
Contacts 3-4 and 7-8: opening of these contacts can be used to monitor contacts 1-2 and 5-6. Service loads (not for Safety Function purpose) are de-energized.

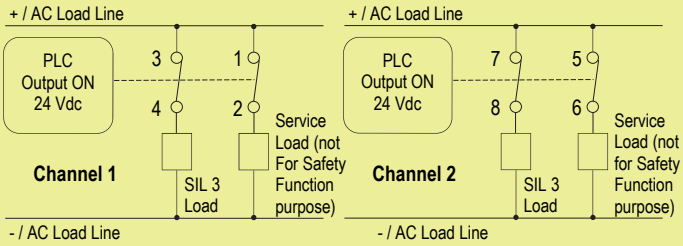
Application for D1092D - Normally De-energized relay condition for ND Load

Normal state operation for D1092D



Contacts 1-2 and 5-6: in normal operation the relay is de-energized, contacts are open, Service Load loads (not for Safety Function purpose) are de-energized.
Contacts 3-4 and 7-8: in normal operation the relay is de-energized, contacts are open, SIL 3 loads are de-energized.

Energized to trip operation D1092D



Contacts 1-2 and 5-6: closing of these contacts can be used to monitor contacts 3 - 4 and 7-8. Service loads (not for Safety Function purpose) are energized
Contacts 3-4 and 7-8: the SIL 3 Safety Function is met when the relay is energized, contacts are closed, SIL 3 loads are energized.