D1048

SIL 3 Digital Output Driver, NE Loads, Loop Powered, DIN-Rail Model D1048S

Characteristics:

General Description:

The single channel DIN-Rail Loop Powered Digital Output Isolator, D1048S, is suitable for driving solenoid valves, visual or audible alarms to alert a plant operator, or other process control devices in Hazardous Area from a driving signal in Safe Area. It can also be used as a controllable supply to power measuring or process control equipment. Its use is allowed in applications requiring up to SIL 3 level (according to IEC 61508:2010 Ed. 2) in safety related systems for high risk industries.
The Safety PLC or DCS driving signal powers the field device through the D1048S, which provides isolation and is capable of monitoring the conditions of the line.
Short and open circuit diagnostic monitoring, dip-switch selectable and active when input power is present, provides LED indication and NC transistor output signaling.
When fault is detected output is de-energized until normal condition is restored.
Line short and open output circuit fault detection is also reflected on the PLC / DCS input circuit providing less than 10 mA consumption.
An override input, dip-switch selectable, is provided to permit a safety system to override the control signal. When enabled, a low input voltage always de-energizes the field device regardless of the input signal.
Three basic output circuits are selectable, with different safety parameters, to interface the majority of devices on the market. The selection among the three output characteristics is obtained by connecting the field device to a different terminal block.

Function:

1 channel I.S. digital output to operate Hazardous Area normally energized loads from PLC or DCS drive logics in Safe Area, providing 3 port isolation (input/output/fault).

Signalling LEDs:

Output status (yellow), fault condition (red).

Field Configurability:

Line Fault Detection enable or disable and Override Control Input enable or disable.

EMC:

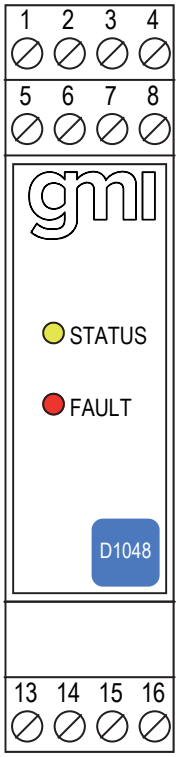
Fully compliant with CE marking applicable requirements.

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 lifetime = 20 years.
- PFDavg (1 year) 0.00 E+00, SFF 100 %.
- SIL 3 Systematic capability
- Output to Zone 0 (Zone 20), Division 1, installation in Zone 2, Division 2.
- Loop powered for NE loads.
- Short and open circuit line diagnostic monitoring with LED, transistor output and current level on input.
- Output short circuit proof and current limited.
- Three port isolation, Input/Output/Fault.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1.
- In-field programmability by DIP Switch.
- ATEX, IECEx, FM & FM-C, INMETRO, EAC-EX, UKR TR n. 898, TÜV Certifications.
- TÜV Functional Safety Certification.
- Type Approval Certificate DNV for maritime applications.
- High Reliability, SMD components.
- Simplified installation using standard DIN Rail and plug-in terminal blocks.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

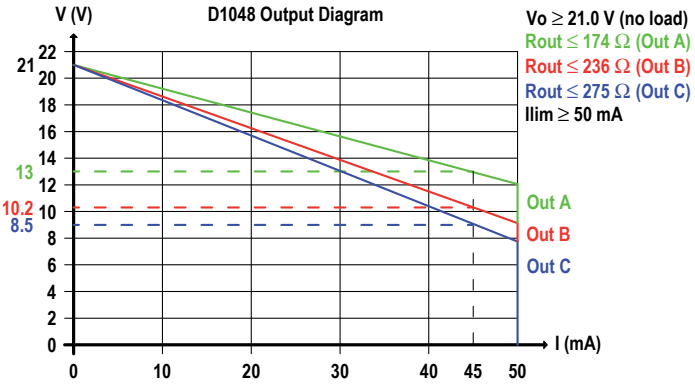
Ordering Information:

Model: D1048S

DIN-Rail accessories:
DIN rail stopper MOR016

Technical Data:

Loop Input: loop powered control signal.
Loop Supply: 24 Vdc nom (20 to 30 Vdc) reverse polarity protected,
2 A time lag fuse internally protected. Supplies also diagnostic monitoring control circuit.
Current consumption @ 24 V: 65 mA with 45 mA output typical in normal operation, ≤ 10 mA when fault circuit enabled and fault condition detected.
Power dissipation: 1.1 W with 24 V supply, output energized at 45 mA nominal load.
Max. power consumption: at 30 V supply voltage, 1.8 W.
Override Input: override control signal de-energizes output when enabled by dip-switch.
Override range: 24 Vdc nom (20 to 30 Vdc) to disable (field device controlled by input), 0 to 5 Vdc to de-energize field device, reverse polarity protected.
Current consumption @ 24 V: 5 mA.
Isolation (Test Voltage):
I.S. Out/In 1.5 KV; I.S. Out/Override 1.5 KV; I.S. Out/Fault 1.5 KV;
In/Fault 500 V; In/Override 500 V; Fault/Override 500 V.
Output:
45 mA at 13.0 V (21.0 V no load, 174 Ω series resistance) at terminals 13-16 Out A.
45 mA at 10.2 V (21.0 V no load, 236 Ω series resistance) at terminals 14-16 Out B.
45 mA at 8.5 V (21.0 V no load, 275 Ω series resistance) at terminals 15-16 Out C.



Short circuit current: ≥ 50 mA (55 mA typical).
Response time: 75 ms.
Fault detection:
field device and wiring open circuit or short circuit detection dip-switch selectable.
When fault is detected output is de-energized until normal condition is restored.
Short output detection: load resistance ≤ 50 Ω (≈ 2 mA forcing to detect fault).
Open output detection: load resistance > 10 KΩ.
Fault signalling: voltage free NE SPST optocoupled open-collector transistor (output de-energized in fault condition and when input power not present).
Open-collector rating: 100 mA at 35 Vdc (≤ 1.5 V voltage drop).
Leakage current: ≤ 50 µA at 35 Vdc.
Loop input consumption: ≤ 10 mA when fault detected.
Response time: ≤ 5 ms.
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 % non condensing.
Storage: temperature limits - 45 to + 80 °C.
Safety Description:

ATEX: II 3(1) G Ex nA [ia Ga] IIC T4 Gc, II (1) D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I
IECEx / INMETRO: Ex nA [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I
FM: NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4, AIS / I, II, III / 1 / ABCDEFG, AEx [ia] IIC
FMC: NI / I / 2 / ABCD / T4, NI / I / 2 / IIC / T4, AIS / I, II, III / 1 / ABCDEFG, Ex [ia] IIC
EAC-EX: 2Ex nA [ia Ga] IIC T4 Gc X, [Ex ia Da] IIIC X, [Ex ia Ma] I X
UKR TR n. 898: 2ExnAiaIIC T4 X, Exial X
associated apparatus and non-sparking electrical equipment.
Uo/Voc = 24.8 V, Io/Isc = 147 mA, Po/Po = 907 mW at terminals 13-16 Out A.
Uo/Voc = 24.8 V, Io/Isc = 108 mA, Po/Po = 667 mW at terminals 14-16 Out B.
Uo/Voc = 24.8 V, Io/Isc = 93 mA, Po/Po = 571 mW at terminals 15-16 Out C.
Um = 250 Vrms, -20 °C ≤ Ta ≤ 60 °C.
Approvals:
DMT 01 ATEX E 042 X conforms to EN60079-0, EN60079-11, EN60079-15, EN60079-26, IECEx BVS 07.0027X conforms to IEC60079-0, IEC60079-11, IEC60079-15, IEC60079-26, INMETRO DNV 13.0108 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11, ABNT NBR IEC60079-15, ABNT NBR IEC60079-26.
FM & FM-C No. 3024643, 3029921C, conforms to Class 3600, 3610, 3611, 3810, ANSI/ISA 12.12.02, ANSI/ISA 60079-0, and C22.2 No.142, C22.2 No.157, C22.2 No.213, E60079-0, E60079-11, E60079-15.
C-IT.MH04.B.00306 conforms to GOST R IEC 60079-0,GOST R IEC 60079-11, GOST R IEC 60079-15.
СЦ 16.0034 X conforms to ДСТУ 7113, ГОСТ 22782.5-78, ДСТУ IEC 60079-15.
TÜV Certificate No. C-IS-236198-04, SIL 3 conforms to IEC61508:2010 Ed. 2.
TÜV Certificate No. C-IS-236198-09, SIL 3 Functional Safety Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.
DNV No.A-13778 Certificates for maritime applications.
Mounting: T35 DIN Rail according to EN50022.
Weight: about 135 g.
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm².
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.

Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (µF)	Lo/La (mH)	Lo/Ro (µH/Ω)
Terminals 13-16			Out A	
Uo/Voc = 24.9 V	IIC	0.112	1.65	39.2
Io/Isc = 147 mA	IIB	0.85	6.63	156.8
Po/Po = 907 mW	IIA	3.01	13.2	313.6
	I	4.35	21.78	514.6
	IIIC	0.86	6.63	156.8
Terminals 14-16			Out B	
Uo/Voc = 24.9 V	IIC	0.112	2.9	52.2
Io/Isc = 110 mA	IIB	0.85	11.8	208.9
Po/Po = 681 mW	IIA	3.01	23.6	417.8
	I	4.35	40.36	700.6
	IIIC	0.86	12.3	213.5
Terminals 15-16			Out C	
Uo/Voc = 24.9 V	IIC	0.112	4.19	62.3
Io/Isc = 93 mA	IIB	0.85	16.79	249.4
Po/Po = 571 mW	IIA	3.01	33.58	498.9
	I	4.35	55.09	818.5
	IIIC	0.86	16.7	249.4

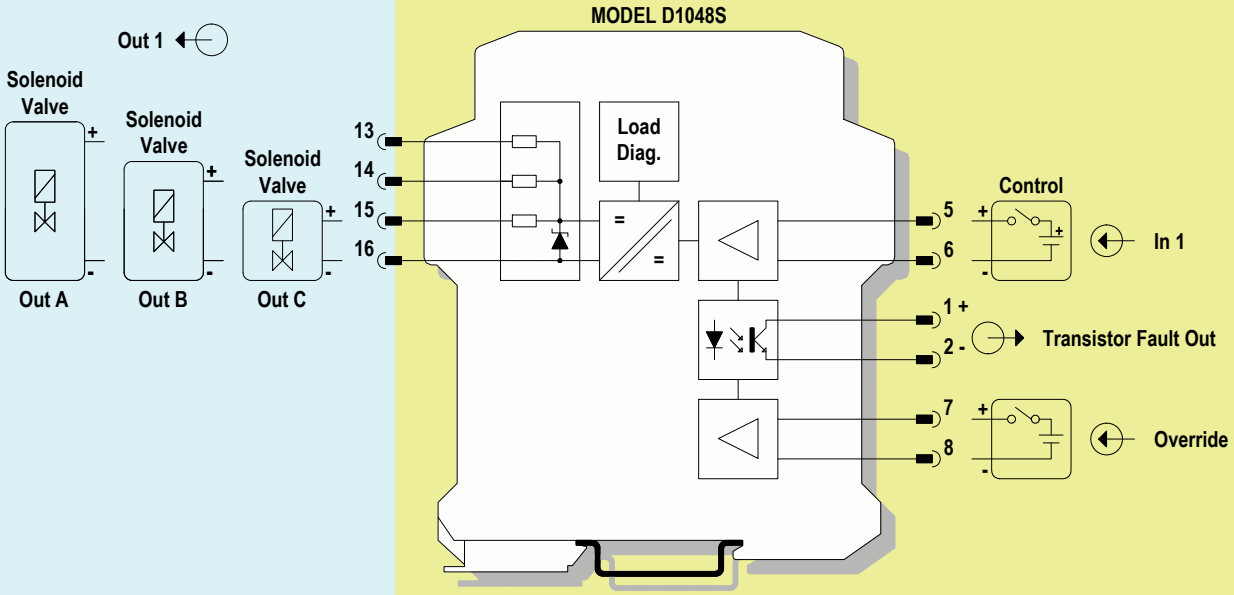
NOTE for USA and Canada:
IIC equal to Gas Groups A, B, C, D, E, F and G
IIB equal to Gas Groups C, D, E, F and G
IIA equal to Gas Groups D, E, F and G

Image:

Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC,
HAZARDOUS LOCATIONS CLASS I, DIVISION 1, GROUPS A, B, C, D,
CLASS II, DIVISION 1, GROUPS E, F, G, CLASS III, DIVISION 1,
CLASS I, ZONE 0, GROUP IIC

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



Use only one output at a time (Out A or Out B or Out C)