GM INTERNATIONAL TECHNOLOGY FOR SAFETY

D5030

SIL 3 Switch/Proximity Detector Repeater, Relay Output DIN-Rail Models D5030S, D5030D

Characteristics:

General Description:

The single and dual channel Switch/Proximity Detector Repeater, D5030S and D5030D module is a unit suitable for applications requiring SIL 3 level (according to IEC 61508:2010 Ed. 2) in safety related systems for high risk industries.
The unit can be configured for switch or proximity detector (EN60947-5-6, NAMUR), NO or NC and for NE or ND SPST (D5030D) or SPDT (D5030S) relay output contact.
Each channel enables a Safe Area load to be controlled by a switch, or a proximity detector, located in Hazardous Area.
Fault detection circuit (DIP switch configurable) is available for both proximity sensor and switch equipped with end of line resistors. In case of fault, when enabled it de-energizes the corresponding output relay and turns the fault LED on; when disabled the corresponding output relay repeats the input line open or closed status as configured.

D5030D is programmable via dip switches as single input and two independent outputs. Out 2 can be programmed for output duplicating Out 1 or Fault detection Out.
In case of duplication, relay actuation can be independently configured for each output.
In case of fault output, relay actuation can be programmed as normally energized or normally de-energized.

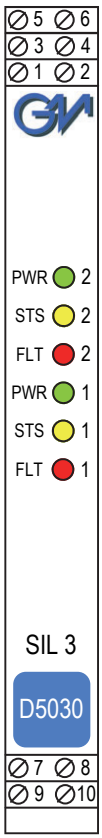
Mounting on standard DIN-Rail, with or without Power Bus, in Safe Area / Non Hazardous Location or in Zone 2 / Class I, Division 2 or Class I, Zone 2.

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 = 2 / 4 years (10 / 20 % of total SIF), considering 100 mA max contact current.
- SIL 2 according to IEC 61508:2010 Ed. 2 for Tproof = 5 / 11 years (10 / 20 % of total SIF), considering 4 A max contact current.
- PFDavg (1 year) 4.92 E-05, SFF 90.06 %, considering 100 mA max contact current.
- PFDavg (1 year) 1.72 E-04, SFF 78.55 %, considering 4 A max contact current.
- Systematic capability SIL 3
- 2 fully independent channels.
- Input from Zone 0 (Zone 20) / Division 1, installation in Zone 2 / Division 2.
- NO/NC switch/proximity Detector Input, NE/ND relay actuation mode.
- Field open and short circuit detection.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety system.
- In-field programmability by DIP Switch.
- ATEX, IECEx, FM, FMC, INMETRO, GOST, TÜV Certifications.
- TÜV Functional Safety Certification.
- Type Approval Certificate DNV for marine applications.
- High Density, two channels per unit.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5030	
1 channel		S
2 channels		D

Power Bus and DIN-Rail accessories:

Connector JDFT049	Cover and fix MCHP196
Terminal block male MOR017	Terminal block female MOR022

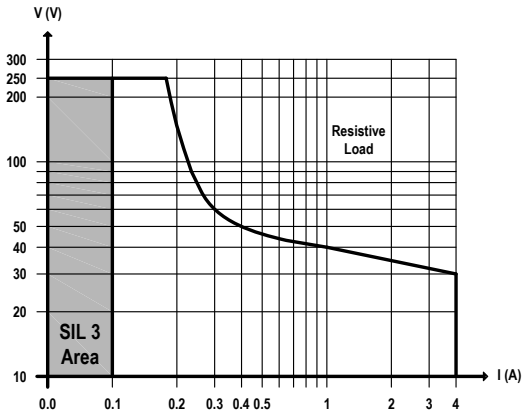
Technical Data:

Supply:
24 Vdc nom (18 to 30 Vdc) reverse polarity protected,
ripple within voltage limits ≤ 5 Vpp, 2 A time lag fuse internally protected.
Current consumption @ 24 V: 35 mA for 2 channels D5030D,
18 mA for 1 channel D5030S with short circuit input and relay energized, typical.
Power dissipation: 0.85 W for 2 channels D5030D, 0.45 W for 1 channel D5030S with 24 V supply voltage, short circuit input and relay energized, typical.

Isolation (Test Voltage):
I.S. In/Out 2.5 KV; I.S. In/Supply 2.5 KV; I.S. In/ I.S In 500 V;
Out/Supply 2.5 KV; Out/Out 2.5 KV.

Input switching current levels:
ON ≥ 2.1 mA (1.9 to 6.2 mA range), OFF ≤ 1.2 mA (0.4 to 1.3 mA range),
switch current ≈ 1.65 mA ± 0.2 mA hysteresis.
Fault current levels: open fault ≤ 0.2 mA, short fault ≥ 6.8 mA
(when enabled both faults de-energize channel relay with single channel unit D5030S or de-energize channel relay with D5030D used as dual channel unit or actuate the fault relay out with D5030D used as fault signaling unit).
Input equivalent source: 8 V 1 KΩ typical (8 V no load, 8 mA short circuit).

Output:
voltage free SPST (D5030D) or SPDT (D5030S) relay contact.
Contact material: Ag Alloy (Cd free), gold plated.
Contact rating: 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).
Min.switching current 1 mA.
DC Load breaking capacity:



Mechanical / Electrical life: 5 * 10^6 / 3 * 10^4 operation, typical.
Operate / Release time: 8 / 4 ms typical.
Bounce time NO / NC contact: 3 / 8 ms typical.
Frequency response: 10 Hz maximum.

Compatibility:
CE mark compliant, conforms to Directives:
94/9/EC Atex, 2004/108/CE EMC, 2006/95/EC LVD, 2011/65/EU RoHS.

Environmental conditions:
Operating: temperature limits – 40 to + 70 °C, relative humidity 95 %, up to 55 °C.
Storage: temperature limits – 45 to + 80 °C.

Safety Description:

ATEX: II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc, II (1) D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I
IECEx / INMETRO: Ex nA nC [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I,
FM: NI-AIS / I / 2 / ABCD /T4, AIS / I,II,III / 1 / ABCDEFG, I / 2 / AEx nA nC [ia] / IIC /T4
FMC: NI-AIS / I / 2 / ABCD /T4, AIS / I,II,III / 1 / ABCDEFG, I / 2 / Ex nA nC [ia] / IIC /T4
GOST R: 2ExnAnC[ia]IICT4 X. ***GOST:*** 2Exs[ia]IICT4 X
associated apparatus and non-sparking electrical equipment.
Uo/Voc = 10.5 V, Io/Isc = 22 mA, Po/Po = 56 mW at terminals 7-8, 9-10.
Um = 250 Vrms, -40 °C ≤ Ta ≤ 70 °C.
Approvals:
BVS 10 ATEX E 113 X conforms to EN60079-0, EN60079-11, EN60079-15, EN60079-26, EN50303,
IECEx BVS 10.0072 X conforms to IEC60079-0, IEC60079-11, IEC60079-15, IEC60079-26.
INMETRO DNV 13.0109 X conforms to ABNT NBR IEC60079-0, ABNT NBR IEC60079-11, ABNT NBR IEC60079-15, ABNT NBR IEC60079-26.
FM 3046304 and FMC 3046304C conforms to Class 3600, 3610, 3810, 3611, ANSI/ISA-60079-0, ANSI/ISA-60079-11, ANSI/ISA-60079-15, C22.2 No.142, C22.2 No.157, C22.2 No.213, C22.2 No. 60079-0, C22.2 No. 60079-11, C22.2 No. 60079-15.
Conforms to GOST 12.2.007.0-75, R 51330.0-99, R 51330.10-99, R 51330.14-99.
Conforms to GOST 12.2.007.0, 22782.0, 22782.3, 22782.5.
TÜV Certificate No. C-IS-236198-04, SIL 2 / 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 Type Approval Certificate for marine applications No.A-13625.

Mounting:
T35 DIN-Rail according to EN50022, with or without Power Bus.
Weight: about 140 g D5030D, 120 g D5030S.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm^2.
Location: installation in Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 or Class I, Division 2, Group A,B,C,D, T4 or Class I, Zone 2, Group IIC, T4.
Protection class: IP 20.
Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (µF)	Lo/La (mH)	Lo/Ro (µH/Ω)
Terminals 7-8, 9-10	IIC	2.41	78.3	635.9
Uo/Voc = 10.5 V	IIB	16.80	313.4	2543.9
Io/Isc = 22 mA	IIA	75.00	626.9	5087.9
Po/Po = 56 mW	I	66.00	1028.6	8347.4
	IIIC	16.80	313.4	2543.9

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

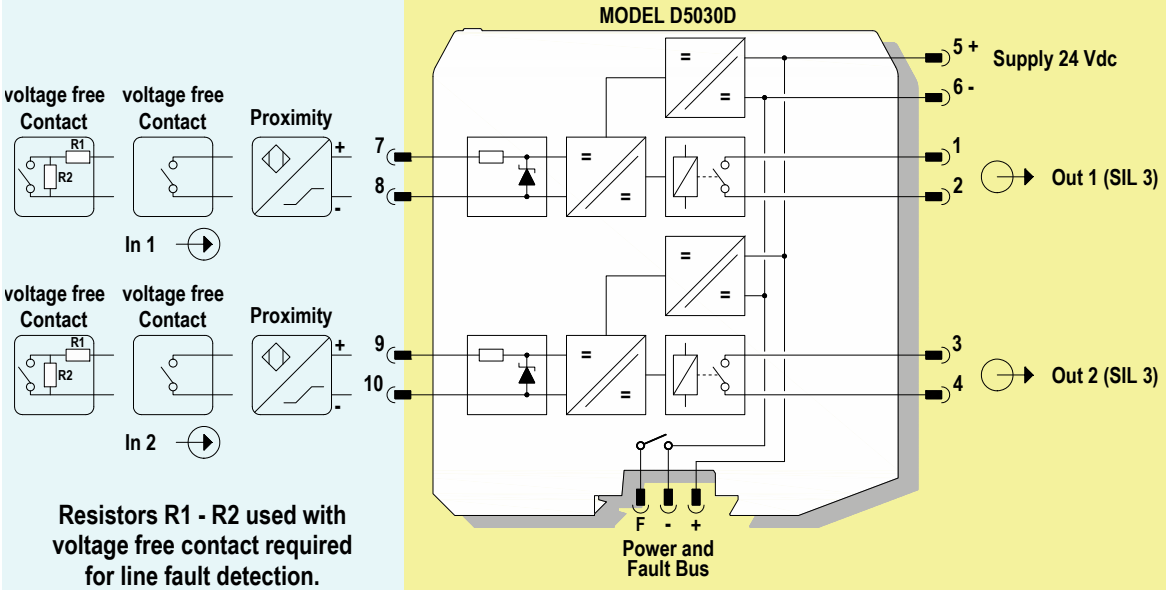
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Function Diagram:

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



Resistors R1 - R2 used with voltage free contact required for line fault detection.

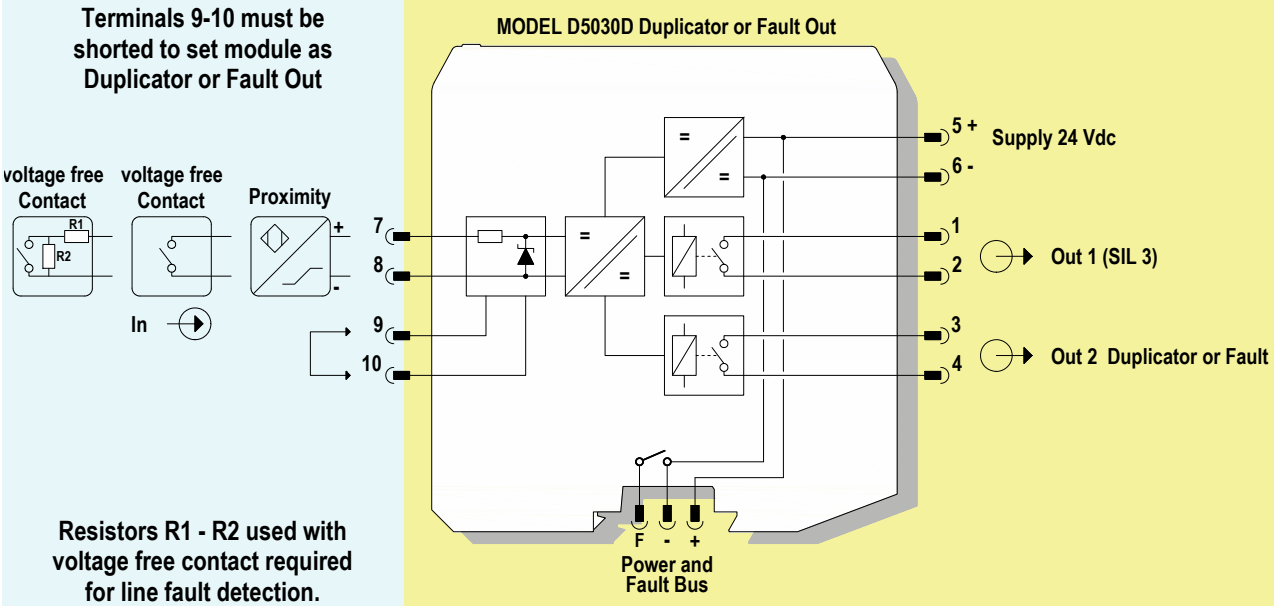
Relay contact shown in de-energized position.
Terminals 1-2 and 3-4 open.

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

Terminals 9-10 must be shorted to set module as Duplicator or Fault Out



Resistors R1 - R2 used with voltage free contact required for line fault detection.

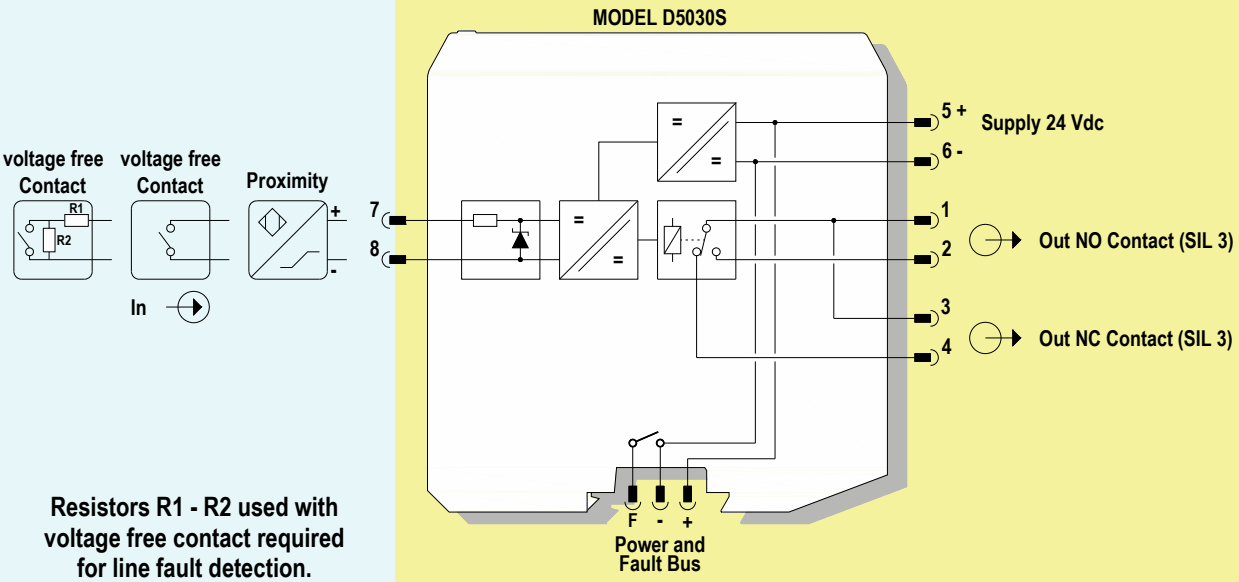
Internal Dip switches programmable

Relay contact shown in de-energized position.
Terminals 1-2 and 3-4 open.

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



Resistors R1 - R2 used with voltage free contact required for line fault detection.

Relay contact shown in de-energized position.
Terminals 1-2 open, terminals 3-4 close.