

## Characteristics:

### General Description:

The single and dual channel Switch/Proximity Detector Repeater, D5037S and D5037D module is a unit suitable for applications requiring SIL 2 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 NO or NC optocoupled open collector transistor output.

Each channel enables a Safe Area load to be controlled by a switch, or a proximity detector, located in Hazardous Area.

A fault detection circuit (DIP switch enabled) 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 transistor and turns the fault LED on; when disabled the corresponding output transistor repeats the input line open or closed status as configured.

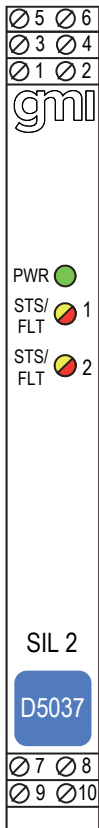
Mounting on standard DIN-Rail, with or without Power Bus, or on customized Termination Boards, in Safe Area or in Zone 2.

### 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.



## Front Panel and Features:



- SIL 2 according to IEC 61508:2010 Ed. 2 for Tproof = 8 / 20 years (≤10% / >10 % of total SIF) for D5037S and D5037D.
- PFDavg (1 year) 1.21 E-04, SFF 77.15 % for D5037S.
- PFDavg (1 year) 1.21 E-04, SFF 78.15 % for D5037D.
- Systematic capability SIL 3
- Input from Zone 0 (Zone 20), installation in Zone 2
- NO/NC switch/proximity Detector Input, NO/NC transistor driving 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, UL & C-UL, EAC-EX, UKR TR n. 898, TÜV Certifications.
- TÜV Functional Safety Certification.
- High Density, two channels per unit.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without Power Bus, or customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

## Ordering Information:

Model:	D5037
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:** 22 mA for 2 channels D5037D,

12 mA for 1 channel D5037S with short circuit input and transistor closed, typical.

**Power dissipation:** 0.53 W for 2 channels D5037D, 0.30 W for 1 channel D5037S with 24 V supply voltage, short circuit input and transistor closed, typical.

### Isolation (Test Voltage):

I.S. In/Out 1.5 KV; I.S. In/Supply 1.5 KV; I.S. In/ I.S In 500 V;

Out/Supply 500 V; Out /Out 500 V.

### 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

**Input equivalent source:** 8 V 1 KΩ typical (8 V no load, 8 mA short circuit).

### Output:

voltage free SPST optocoupled open-collector transistor.

**Open-collector rating:** 100 mA at 35 Vdc (≤ 1.5 V voltage drop).

**Leakage current:** ≤ 50 µA at 35 Vdc.

**Response time:** ≤ 100 µs.

**Frequency response:** 5 KHz 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 – 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 [ia Ga] IIC T4 Gc, II (1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I

**IECEx:** Ex nA [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I

**UL:** NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, AEx nA [ia Ga] IIC T4 Gc

**C-UL:** NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, Ex nA [ia Ga] IIC T4 Gc

**EAC-EX:** 2Ex nA [ia Ga] IIC T4 Gc X, [Ex ia Da] IIIC X, [Ex ia Ma] I X

**UKR TR n. 898:** 2ExnAiaIICT4 X, Exial 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, IECEx BVS 10.0072X conforms to IEC60079-0, IEC60079-11, IEC60079-15, UL & C-UL E222308 conforms to UL913, UL 60079-0, UL60079-11, UL60079-15, ANSI/ISA 12.12.01 for UL and CSA-C22.2 No.157-92, CSA-E60079-0, CSA-E60079-11, CSA-C22.2 No. 213 and CSA-E60079-15 for C-UL.

C-IT.ME62.B.04182 conforms to GOST R IEC 60079-0, GOST R IEC 60079-11, GOST R IEC 60079-15.

CL 16.0036 X conforms to DCTY 7113, GOCT 22782.5-78, DCTY IEC 60079-15.

TÜV Certificate No. C-IS-236198-04, SIL 2 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.

### Mounting:

T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

**Weight:** about 125 g D5037D, 110 g D5037S.

**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**Location:** installation in Safe Area or 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
Uo/Voc = 10.5 V	IIB	16.8	313.4	2543
Io/Isc = 22 mA	IIA	75	626.9	5087
Po/Po = 56 mW	I	66	1028.6	8347
	IIIC	16.8	313.4	2543

NOTE for USA and Canada:

IIC equal to Gas Groups A, B, C, D, E, F and G

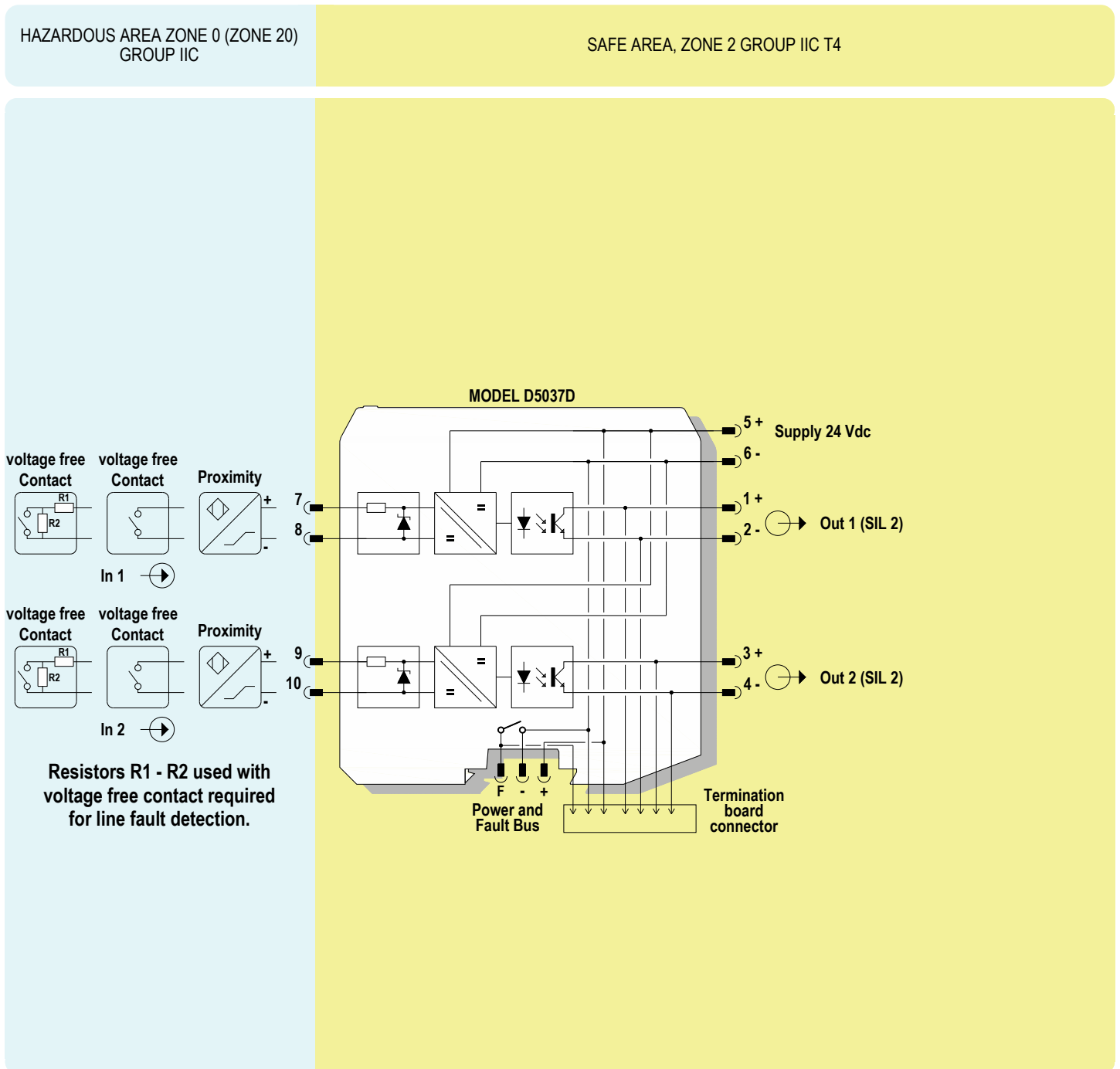
IIB equal to Gas Groups C, D, E, F and G

IIA equal to Gas Groups D, E, F and G

**Image:**



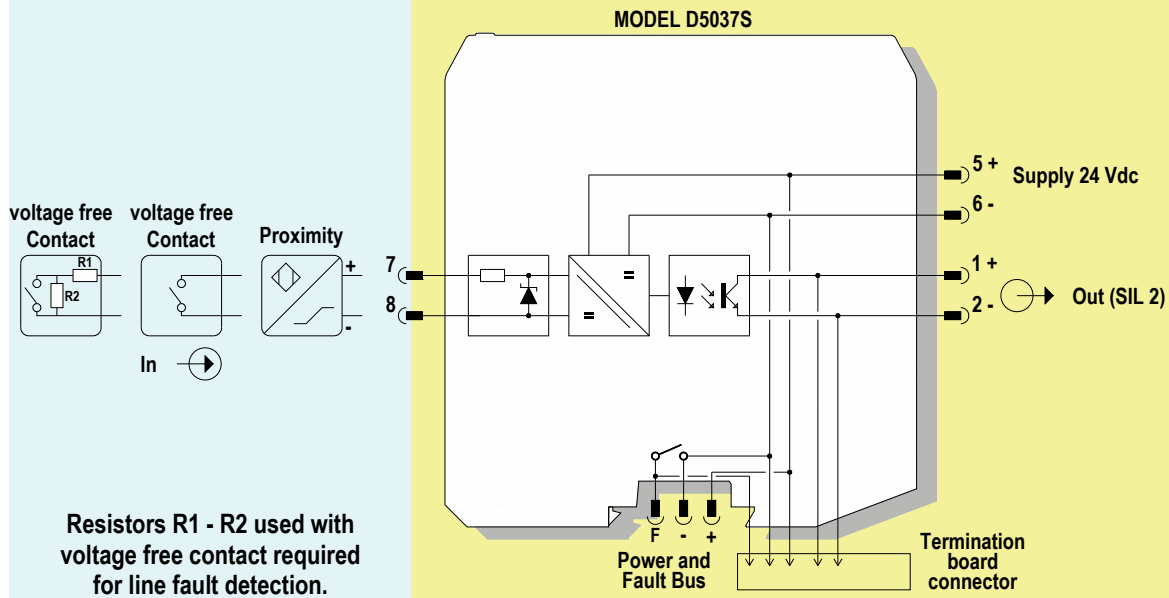
**Function Diagram:**



# Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20)  
GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4



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