

# Switch/Proximity Detector Repeater Transistor Output DIN-Rail Models D1031D, D1031Q

## Characteristics:

### General Description:

The Switch/Proximity Detector Repeater type D1031 is a DIN Rail unit configurable with two or four independent channels.  
The unit can be configured for contact or proximity detector, 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.  
**D1031Q quad channel** type has four independent input channels and actuates the corresponding output transistor. Two actuation modes can be independently DIP switch configured on each input channel: NO In/NC transistor or NO In/NO transistor. Contact or proximity sensor and its connection line short or open circuit fault detection is also DIP switch configurable: fault detection can be enabled (in case of fault it de-energizes the corresponding output transistor and turns the fault LED on) or disabled (in case of fault the corresponding output transistor repeats the input line open or closed status as configured).  
**D1031D dual channel** type has two input channels and four output transistors; the unit has two DIP switch configurable operating modes:  
Mode A) Input channel actuates in parallel the two output transistors. Transistor actuation mode can be independently configured for each output in two modes: NO In/NC transistor or NO In/NO transistor.  
Mode B) Input channel actuates output transistor (A) configurable in two modes as in mode A above. Output transistor B operates as a fault output (in case of input fault, transistor B actuates and the fault LED turns on while transistor A repeats the input line as configured). Actuation can be DIP switch configured in two modes: No input fault/Energized transistor (it de-energizes in case of fault) or No input fault/De-energized transistor (it energizes in case of fault).

### Function:

2 or 4 channels I.S. switch repeater for contact or EN60947-5-6 Proximity Provides 3 port isolation (input/output/supply).

### Signalling LEDs:

Power supply indication (green), Output status (yellow), Line fault (red).



### Field Configurability:

NO/NC input for Contact/Proximitator, NO/NC Transistor operation and Fault detection enable/disable.

### EMC:

Fully compliant with CE marking applicable requirements.

## Front Panel and Features:

1 2 3 4 	• NO/NC Contact/Proximity Detector Input.
5 6 7 8 	• Four Opto Isolated Voltage free Transistor Output Signals.
  <input type="checkbox"/> PWR ON <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <b>STATUS/FAULT</b> 	<ul style="list-style-type: none"> <li>• Transistor Output for fault detection on 2 channels version.</li> <li>• Three port isolation, Input/Output/Supply.</li> <li>• EMC Compatibility to EN61000-6-2, EN61000-6-4.</li> <li>• Field programmability by DIP Switch.</li> <li>• ATEX, UL &amp; C-UL, Russia and Ukraine Certifications.</li> <li>• High Reliability, SMD components.</li> <li>• High Density, four channels per unit.</li> </ul>
	9 10 11 12 
13 14 15 16 	• 250 Vrms (Um) max. voltage applied to the instruments associated with barrier.

## Technical Data:

### Supply:

12-24 V nom (10 to 30 V) reverse polarity protected ripple within voltage limits  $\leq 5$  Vpp.

**Current consumption @ 24 V:** 65 mA for 4 channels D1031Q, 60 mA for 2 channels D1031D with transistor energized.

**Current consumption @ 12 V:** 120 mA for 4 channels D1031Q, 110 mA for 2 channels D1031D with transistor energized.

**Max. power consumption:** 1.80 W for 4 channels, 1.60 W for 2 channels with 30 V supply voltage, short circuit input and transistor energized.

### Isolation (Test Voltage):

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

Out/Supply 500 V, Out 1-3/Out 2-4 500 V.

### Input switching current levels:

ON  $\geq 2.1$  mA, OFF  $\leq 1.2$  mA,

Switch current  $\approx 1.65$  mA  $\pm 0.2$  mA hysteresis.

**Fault current levels:** Open fault  $\leq 0.2$  mA, Short fault  $\geq 6.8$  mA (when enabled both faults de-energize channel transistor with quad channel unit D1031Q or actuate fault transistor with dual channel unit D1031D).

**Input equivalent source:** 8 V 1 K $\Omega$  typical (8 V no load 8 mA short circuit).

### Output:

Voltage free SPST optocoupled open-collector transistor.

**Open-collector rating:** 50 mA at 35 V or 100 mA at 12 V ( $\leq 2.0$  V voltage drop).

**Leakage current:**  $\leq 50$   $\mu$ A at 35 V.

**Response time:** 500  $\mu$ s.

**Frequency response:** 1 KHz maximum.

### Compatibility:

 CE mark compliant, conforms to 94/9/EC Atex Directive and to 89/336/CEE EMC Directive.


### Environmental conditions:


**Operating:** Temperature limits -20 to + 60 °C,

relative humidity max 90 % non condensing, up to 35 °C.

**Storage:** Temperature limits - 40 to + 80 °C.

### Safety Description:

 II (1) G D [EEx ia] IIC or IM2 [EEx ia] I, II 3 G EEx nA IIC T4 associated electrical apparatus.  
Uo/Voc = 10.9 V, Io/Isc = 15 mA, Po/Po = 40 mW at terminals 13-14, 15-16, 9-10, 11-12.

 Um = 250 Vrms, -20 °C  $\leq$  Ta  $\leq$  60°C.

**Approvals:** DMT 01 ATEX E 042 X conforms to EN50014, EN50020, UL & C-UL E222308 conforms to UL913 (Div.1), UL 60079-0 (General, All Zones), UL60079-11 (Intrinsic Safety "i" Zones 0 & 1), UL60079-15 ("n" Zone 2), UL 1604 (Div.2) for UL and CSA-C22.2 No.157-92 (Div.1), CSA-E60079-0 (General, All Zones), CSA-E60079-11 (Intrinsic Safety "i" Zones 0 & 1), CSA-C22.2 No. 213-M1987 (Div. 2) and CSA-E60079-15 ("n" Zone 2) for C-UL, TCCEXEE (Russia) Nr.665 according to GOST R 51330.0-99, 51330.10-99 [Exia]IIC X, TCCEXEE (Ukraine) Nr.665 according to GOST 12.2.007.0, 22782.0, 22782.5 ExialIIC X, Gosgortekhnadzor of Russia Permit Nr. PPC 04-11284.

### Mounting:

T35 DIN Rail according to EN50022.

**Weight:** about 130 g D1031Q, 120 g D1031D.

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

**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.

## Ordering Information:

Model:	D1031		
2 channels		D	
4 channels		Q	
Power Bus enclosure			/B

## Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	Lo/Ro (μH/Ω)
<b>Terminals</b> 13-14, 15-16, 9-10, 11-12				
Uo/Voc = 10.9 V	II C	2.05	165	890
Io/Isc = 15 mA	II B	14.40	661	3580
Po/Po = 40 mW	II A	63.00	1320	7160

### NOTE for USA and Canada:

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

II B equal to Gas Groups C, D, E, F and G.

II A equal to Gas Groups D, E, F and G.

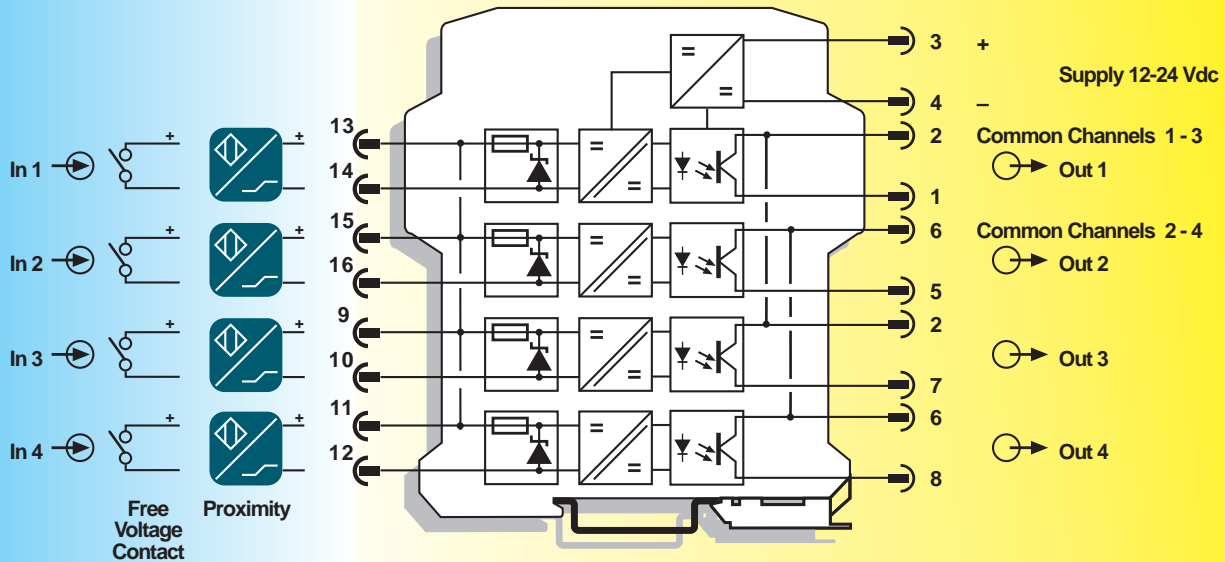


## Function Diagram:

**HAZARDOUS AREA / HAZARDOUS LOCATIONS**  
CLASS I, DIVISION 1, GROUPS A, B, C, D and  
CLASS II, DIVISION 1, GROUPS E, F, G or CLASS I, Zone 0, GROUP IIC

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

MODEL D1031Q



MODEL D1031D

