

**Application Note for Digital Unit testing:**

**Digital Input Models:**

D1030S	1 channel Switch/Proximity Detector Repeater, Relay Output
D1030D	2 channels Switch/Proximity Detector Repeater, Relay Output
D1031D	2 channels Switch/Proximity Detector Repeater, Optocoupled Transistor Output
D1031Q	4 channels Switch/Proximity Detector Repeater, Optocoupled Transistor Output
D1032D	2 isolated channels Switch/Proximity Detector Repeater, Relay Output
D1032Q	4 isolated channels Switch/Proximity Detector Repeater, Relay Output
D1033D	2 isolated channels Switch/Proximity Detector Repeater, Optocoupled Transistor Output
D1033Q	4 isolated channels Switch/Proximity Detector Repeater, Optocoupled Transistor Output

**Digital Output Models:**

D1040Q	4 channels Digital Output Loop/Bus Powered 22 mA 13.2 V to drive solenoid
D1041Q	4 channels Digital Output Loop/Bus Powered 10 mA to drive LEDs
D1042Q	4 channels Digital Output Loop/Bus Powered 22 mA 14.5 V to drive solenoid
D1043Q	4 channels Digital Output Loop/Bus Powered 22 mA 10.6 V to drive solenoid
PSD1001	4 channels Power Supply for Hazardous Area Equipment

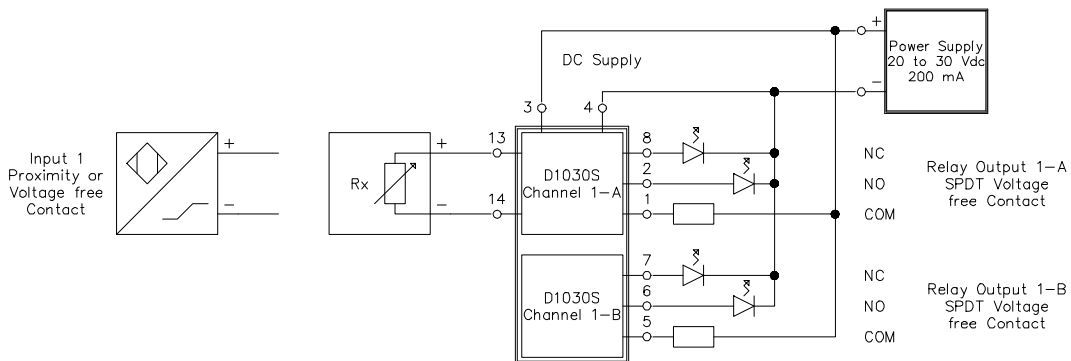
This application note is intended to be read and used in conjunction with the relevant data and installation sheet of Series D1000 (respectively in order DTS0020, DTS0023, DTS0148, DTS0151, DTS0038, DTS0145 and ISM0008, ISM0009, ISM0041, ISM0043, ISM0020, ISM0023).

**Application**

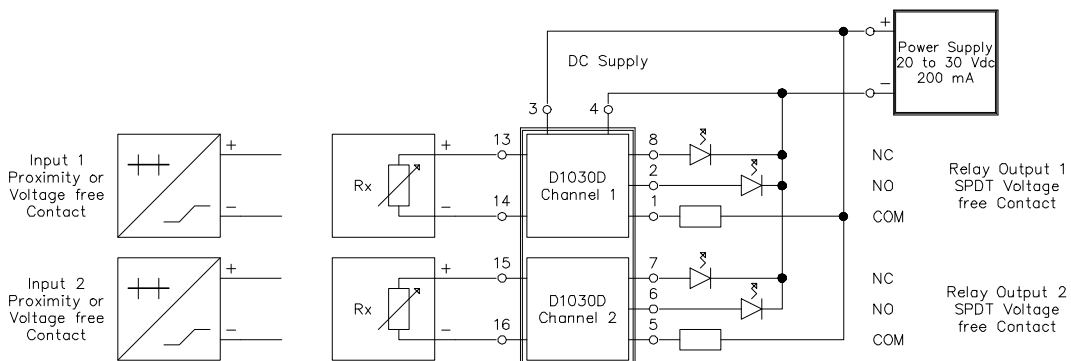
The following diagrams indicate how to connect the units and how to simulate various input/output conditions. The equipment necessary to conduct the testing are a power supply capable of 20 to 30 Vdc output with 200 mA current, a multimeter with 30 Vdc range, 10 mV resolution, 1% precision, and a resistor decade 100 K $\Omega$  range, 10  $\Omega$  resolution, 1% precision. You will need also some LEDs, fixed value resistors and switches to set the input/output conditions.

**DIGITAL INPUT MODULES**

D1030S Connection



D1030D Connection

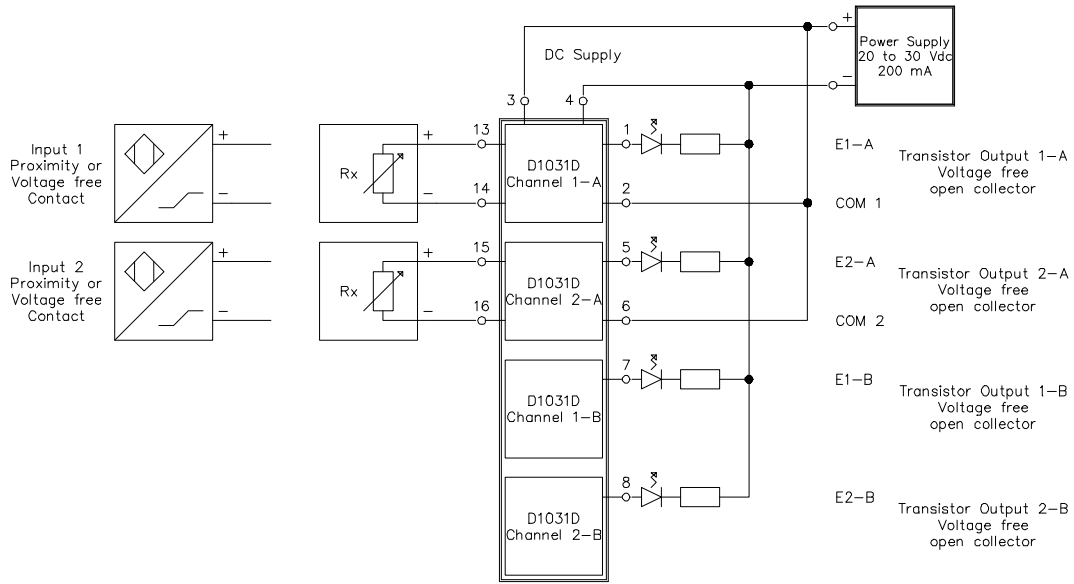


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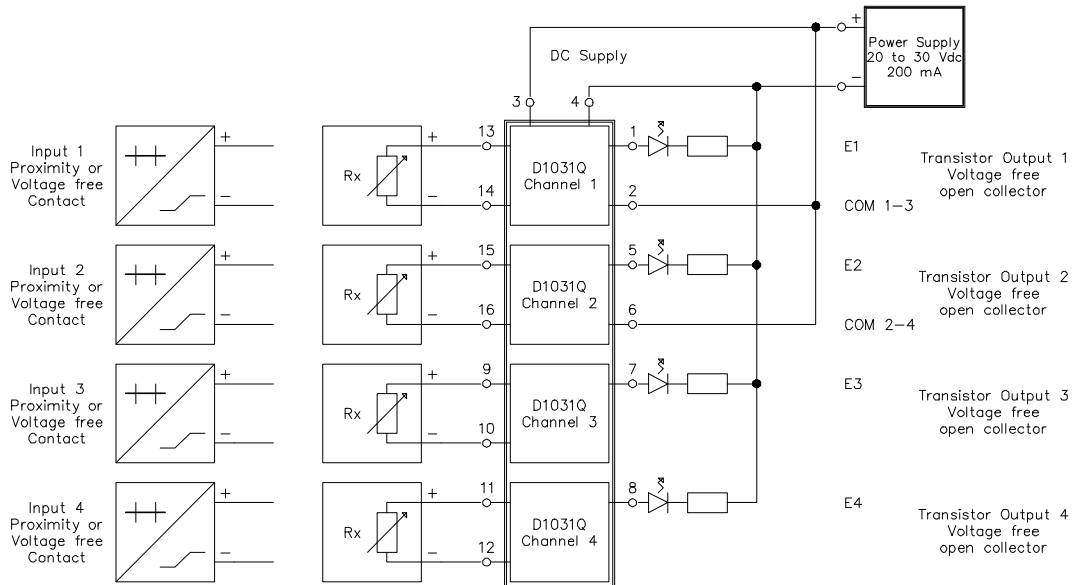
## D1030, D1031, D1032, D1033

### D1040, D1041, D1042, D1043, PSD1001

#### D1031D Connection



#### D1031Q Connection

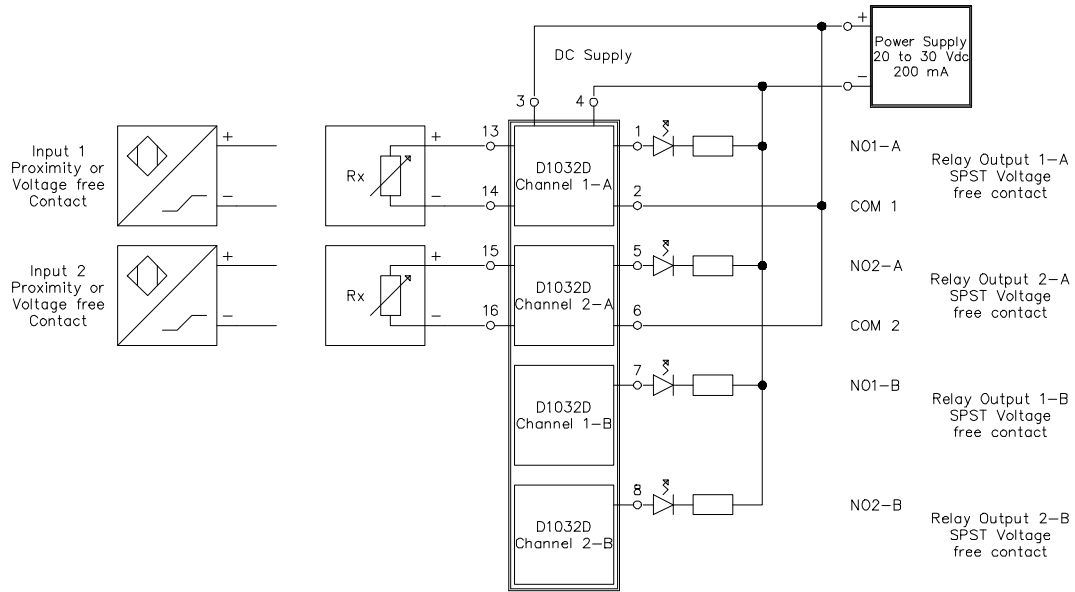


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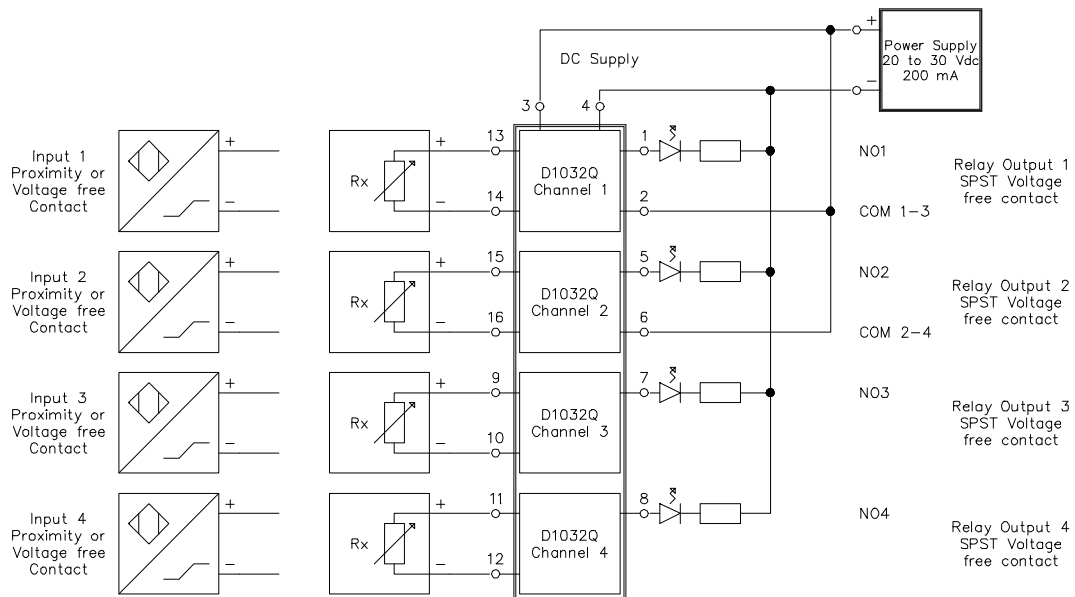
### D1030, D1031, D1032, D1033

### D1040, D1041, D1042, D1043, PSD1001

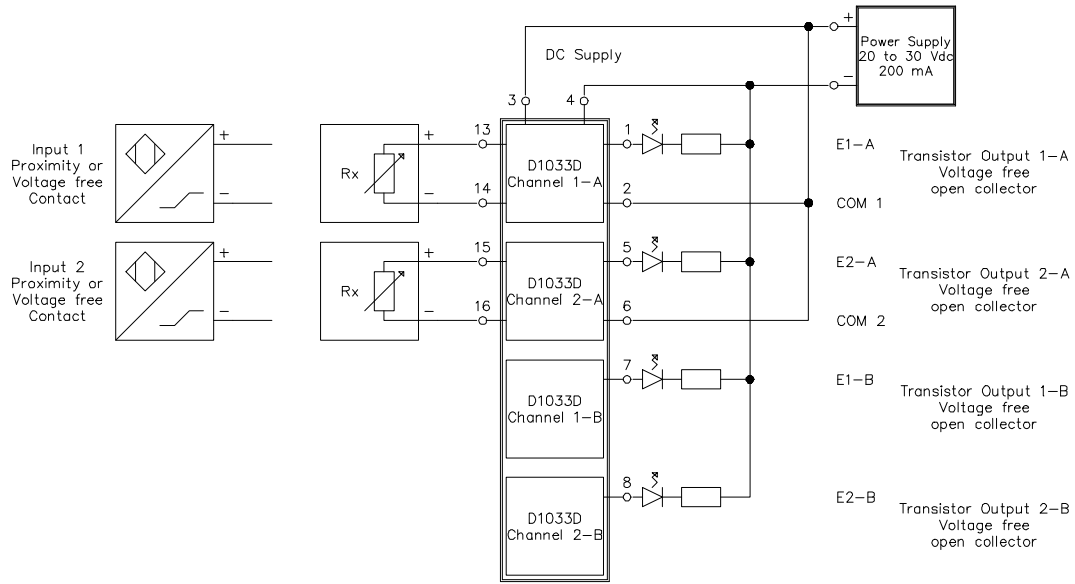
#### D1032D Connection



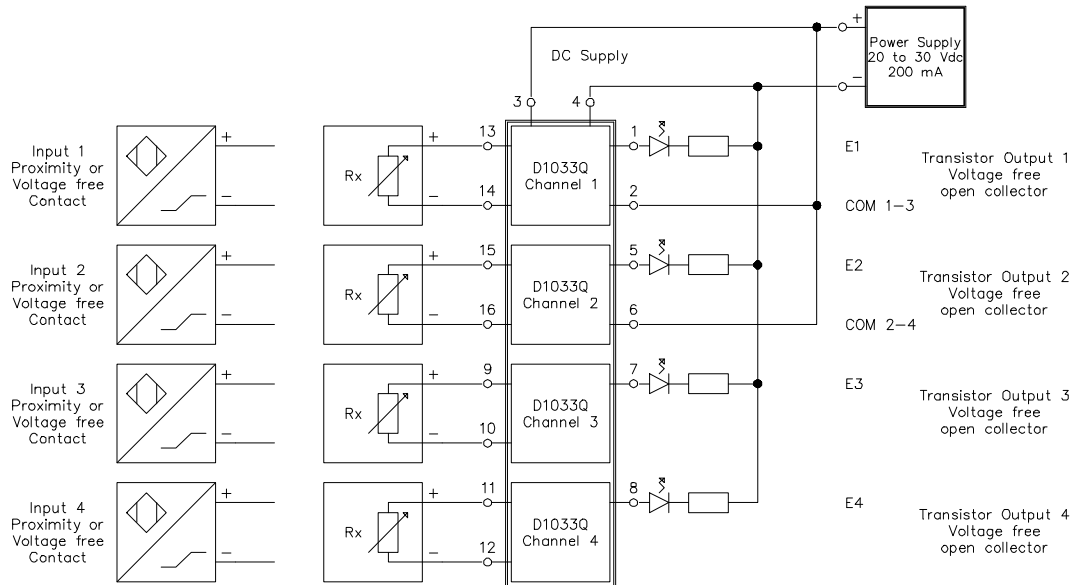
#### D1032Q Connection



D1033D Connection



D1033Q Connection



### Testing

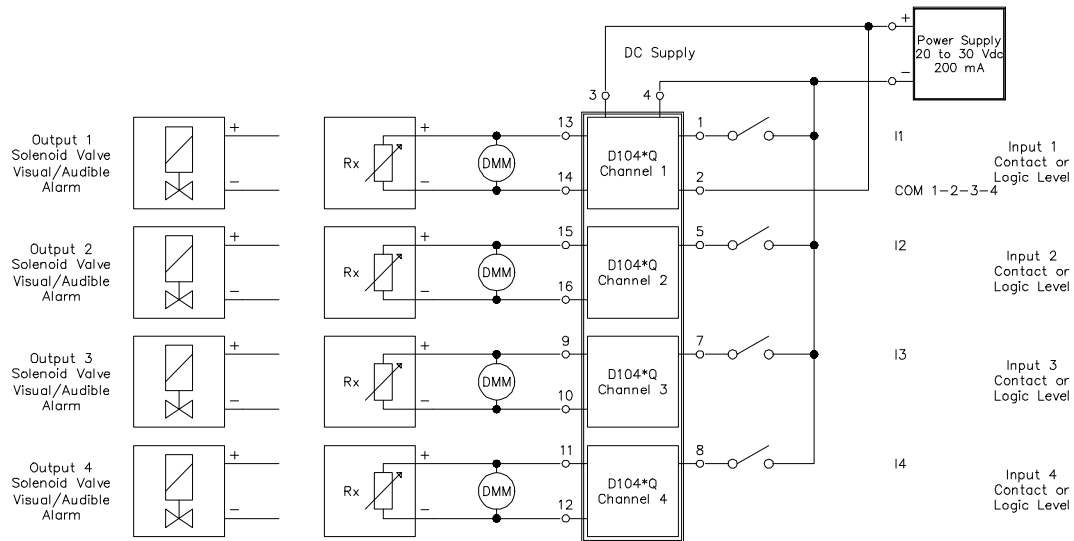
Connect the decade resistor "Rx" at the input terminal as indicate in the diagram (one channel testing). Set the decade at 10 K $\Omega$  to simulate a proximity open condition, the indication LED on unit and output LED on terminal block must be relevant with the dip-switch setting indicated in the installation sheet. Set the decade at 1 K $\Omega$  and the unit must change the status of output and LED indication. The "ON" yellow LED condition on top of the unit indicate a energized relay or closed transistor while the "OFF" condition indicate a de-energized relay or opened transistor. The "ON" red LED indicates a fault condition (open or short field wiring) if fault detection is enabled. Repeats this procedure for each channel of the unit to complete testing.

### Thermal Verification

Set the switches on the unit for contact input type (fault detection disabled) with normally close/normally energized (or normally close for transistor) functioning phase. Connect a wire from input terminal positive and negative of the unit (for all channel applicable) to simulate a closed (short circuit) contact. The yellow LEDs on the unit must be "ON". The output indication LEDs must be "ON" too. This condition is the maximum power dissipation because all the power consumption is internally dissipated on the resistor barrier and the relays (or transistors) are energized dissipating power.

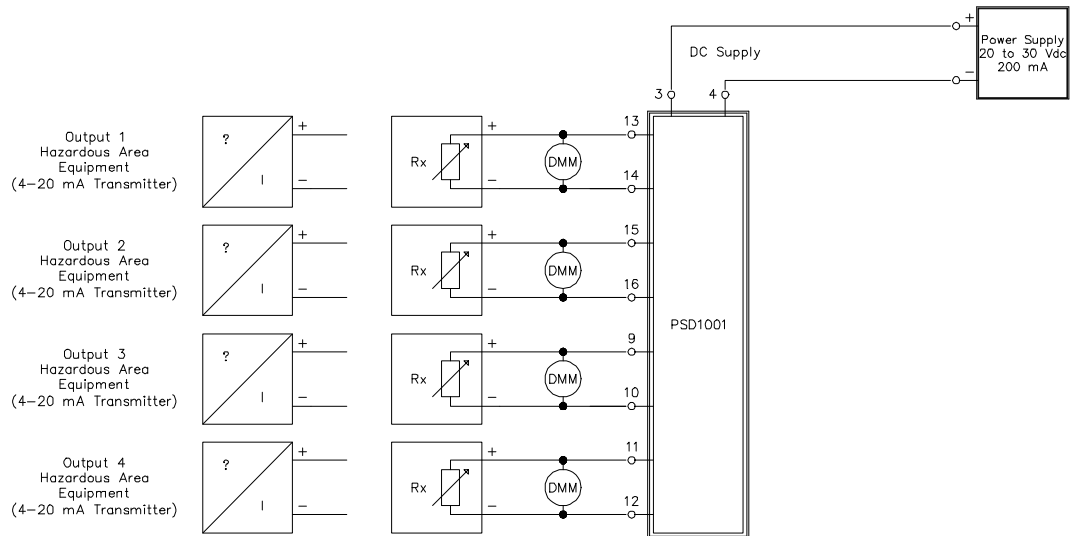
**DIGITAL OUTPUT MODULES**

D104\*Q Connection



Note: Schematic Diagram valid for D1040Q, D1041Q, D1042Q, and D1043Q

PSD1001 Connection



**Testing**

Connect the decade resistor “Rx” at the output terminal as indicate in the diagram (one channel testing). Set the decade at 600 Ω, 1600 Ω, 670 Ω or 490 Ω respectively for the D1040, 41, 42 or 43 unit to simulate a load with 22 mA consumption (10 mA for D1041Q). Close the input command switch of the relevant channel to activate the corresponding output. The yellow LED on the top of the unit must be in “ON” condition, check that the multimeter reads an output voltage similar than one indicated in the data sheet (13.2, 15.9, 14.5 or 10.6 Vdc for type D1040, 41, 42, 43 unit). Repeats this procedure for each channel of the unit to complete testing. Note: The PSD1001 barrier has the same output functionality of the D1042Q while giving the supply energize the output without further input command.

**Thermal Verification**

Connect a wire from output terminal positive and negative of the unit (for all channel) to simulate a short circuit output. Close the entire command switch to turn “ON” the output. The yellow LEDs on the unit must be “ON”. This condition is the maximum power dissipation because all the power consumption is internally dissipated on the resistor barrier and internal circuitry.