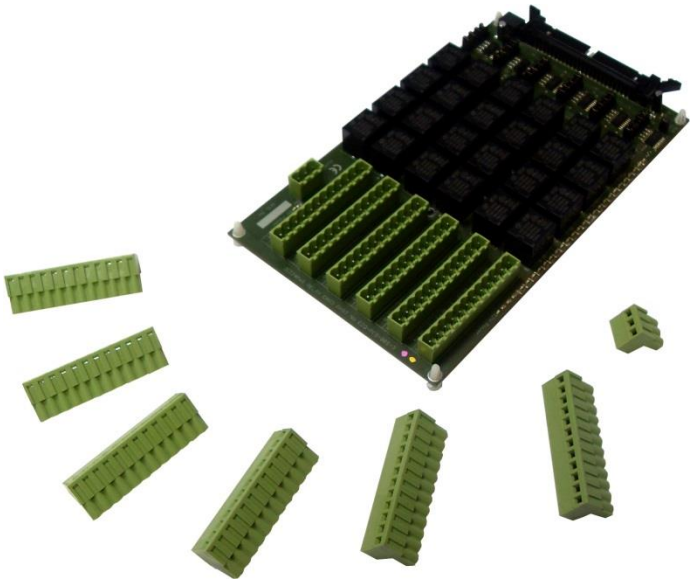
DIO24MxS and DIO24MxS2
24 channel relay cards
Low cost Data Acquisition & Control products

Product Datasheet 59

Features

- Requires 12V DC external power supply (via 2.5mm DC jack socket or screw term's)
- On-board 5V may be supplied via 50 way header connector or on-board regulator.
- Relays can be fully opto-isolated by removing a link and using the on-board 5V regulator.
- Relays are SPDT, Form C, changeover type, with N/O, COM and N/C contacts taken to terminal blocks
- One part and for lower cost and reduced board height or two part screw terminal blocks allowing quick connect/ disconnect of card.
- PCB Tracking will handle 4 amps (10 amp relay contacts). See table of Temperature rise of track with current.
- Channels can be configured as either inputs or outputs via user selectable links.
- 12V Power consumption approx. 800mA Max with all relays active.
- Opto-isolated relay drive voltage 0/5V logic.
- 2K2 opto-isolator input resistor per channel.
- Relay control opto-isolation 2500V rms (minimum).
- Pin compatible with NIDAQ DIO24/6503 DIO card.
- Supplied with nylon feet (will take self-tapping screws).
- Mounting holes allow cards to be stacked if required.
- A protective Perspex cover & base is also available.
- 5V max output voltage per channel.
- 20mA (max) drive current per output (40mA max per 8 channels) when driven from 24 channel DIO card.
- Directly compatible with our range of 24 channel USB and serial output cards.



Description

These cards are general purpose 12V, 24 channel relay cards. All cards have a 50 way header connector (compatible with NIDAQ DIO24/6503 DIO card) which connects to opto-isolated input relay drive signals.

All relay contacts are connected to two-part screw terminal blocks and power connections are also available via a 3 way terminal block.

Digital inputs can be connected via the N/O of the terminal block connections and on-board header links, directly to the 50 way header.

These cards are also compatible with our range of 24 channel serial port DIO cards which can be used to control up to 24 relays or to achieve a mixture of relay control and logic level digital input & output signals.

Specifications

Control Interface
50 way, (90°) male header connector, 0/5V logic drive signal (2K2 input resistor/40mA max).

Power supply
5V DC/150mA (max, supplied from DIO24 card)) & 12V DC/800mA (max)

Operating temp range
0-70°C

Relays
See page 2 for technical details of the relays used

Output channels
5V (max) @ 20mA (max) per output or 40mA (max) for per group of 8 channels

Dimensions
Dimensions approx. 230mm (D) 127mm (W) 20mm or 26mm (H) (exc. feet). Weight 450 g.

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Specification: Relays

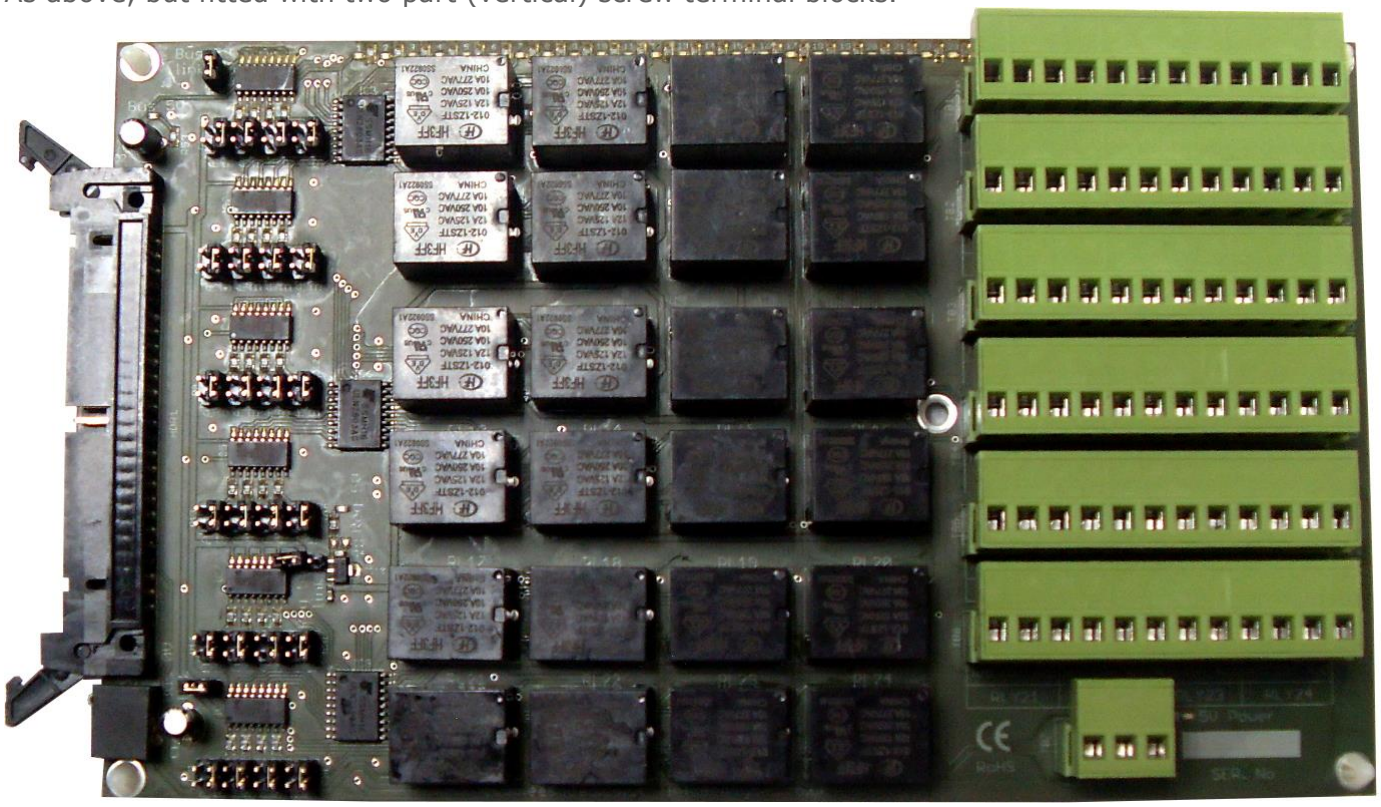
Parameter	12V Power relays
Rated voltage/current	12VDC/30mA each
Must operate/release voltage	75%/10% of rated voltage
Contact ratings	10A/240VAC or 8A 30VDC
Contact resistance	100mΩ max
Operate/release time	10mS/5mS
Contact bounce period	0.6mS operate/ 7.2mS release
Contact material	$AgSnO_2$
Operational life (min)	Mechanical 10^7 / Electrical 10^5
Contact arrangement	SPDT, Form C

Other relay voltage may be available to order. Please contact EasyDAQ for 5 and 6 Volt relay options.

Order codes

DIO24MxS2
24 channel relay card fitted with two part (right angle) screw terminal blocks for connection to all relay contacts.

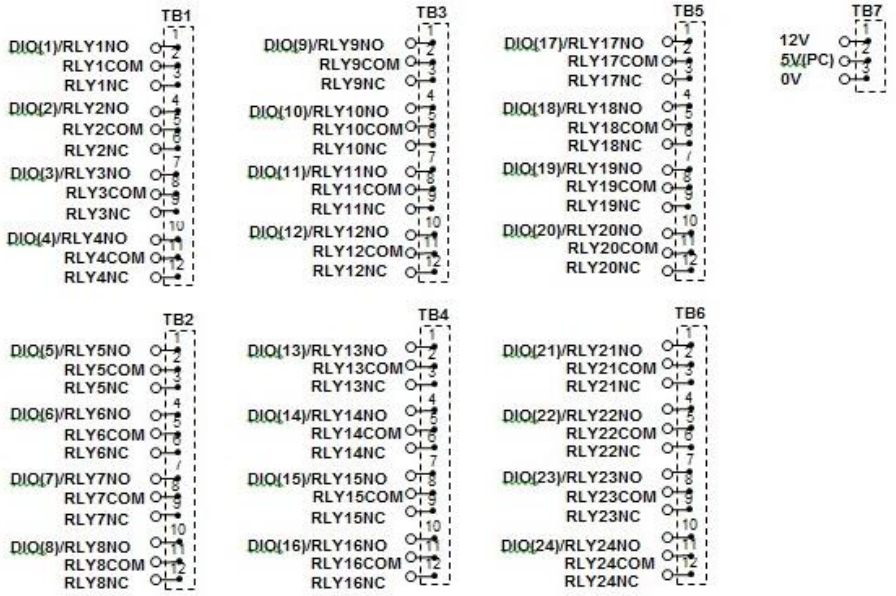
DIO24MxS2V
As above, but fitted with two part (vertical) screw terminal blocks.



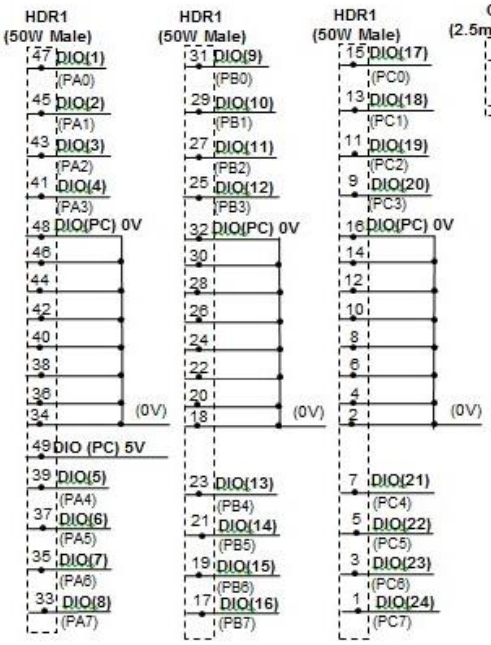
Connectivity:

External connections to the cards are shown below:

Relay connections:



Drive & power connections:



Card layout:

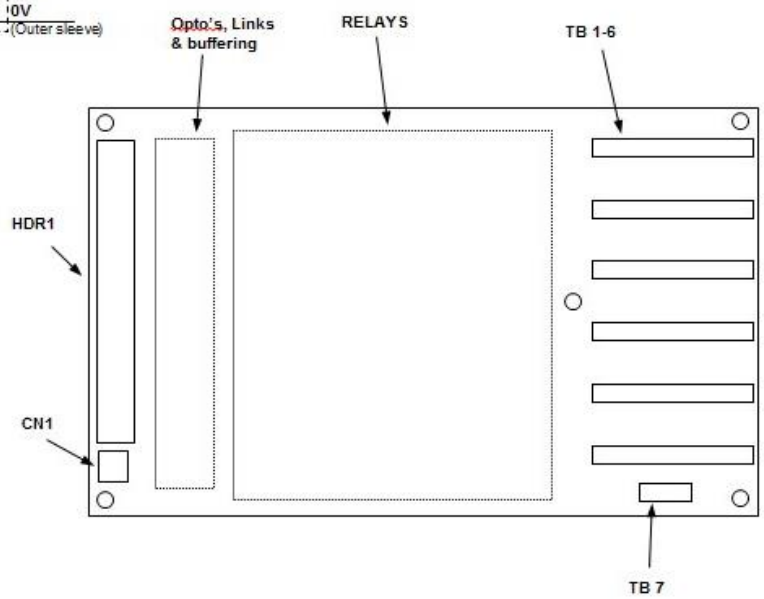


Figure 1. Relay card connectivity.

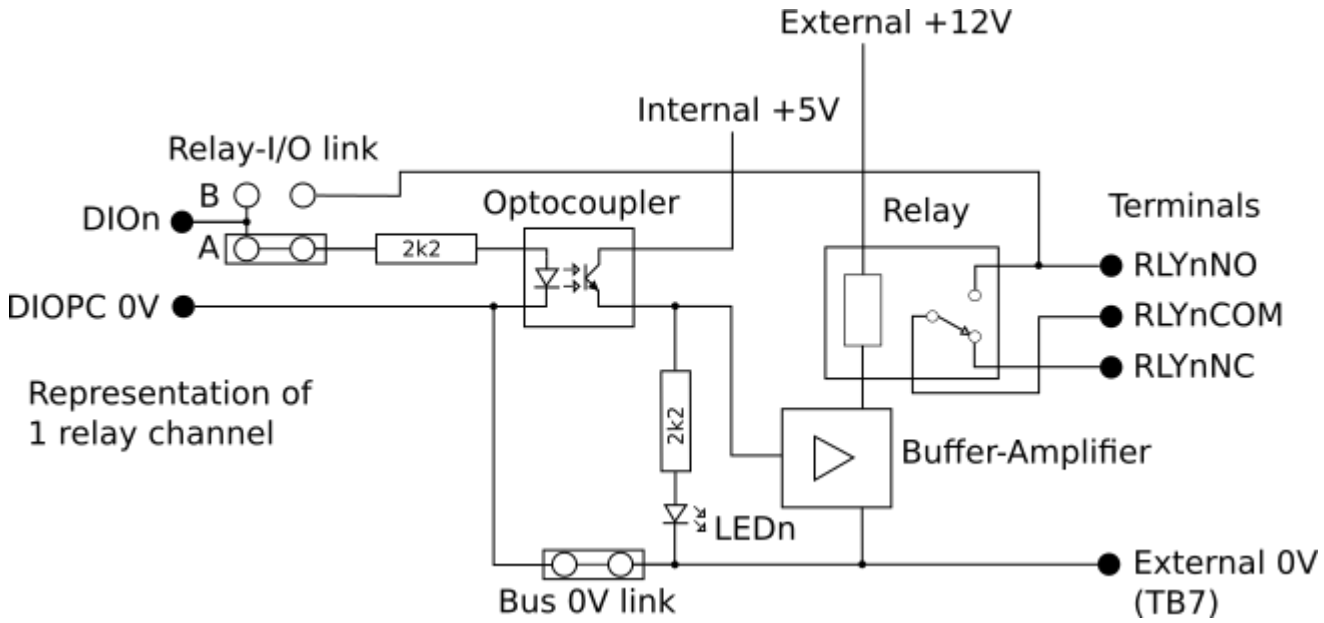


Figure 2. Representation of the signal path through 1 channel of the relay card.

A data signal can either be routed to a relay via an Optocoupler using the associated link in position "A" or the data signal can be routed directly to the "RELAYnNO" terminal.

The control of the relays can be fully isolated by disconnecting the "Bus 0V link" and "Bus 5V link". See Figure 3 for the "Bus 5V link".

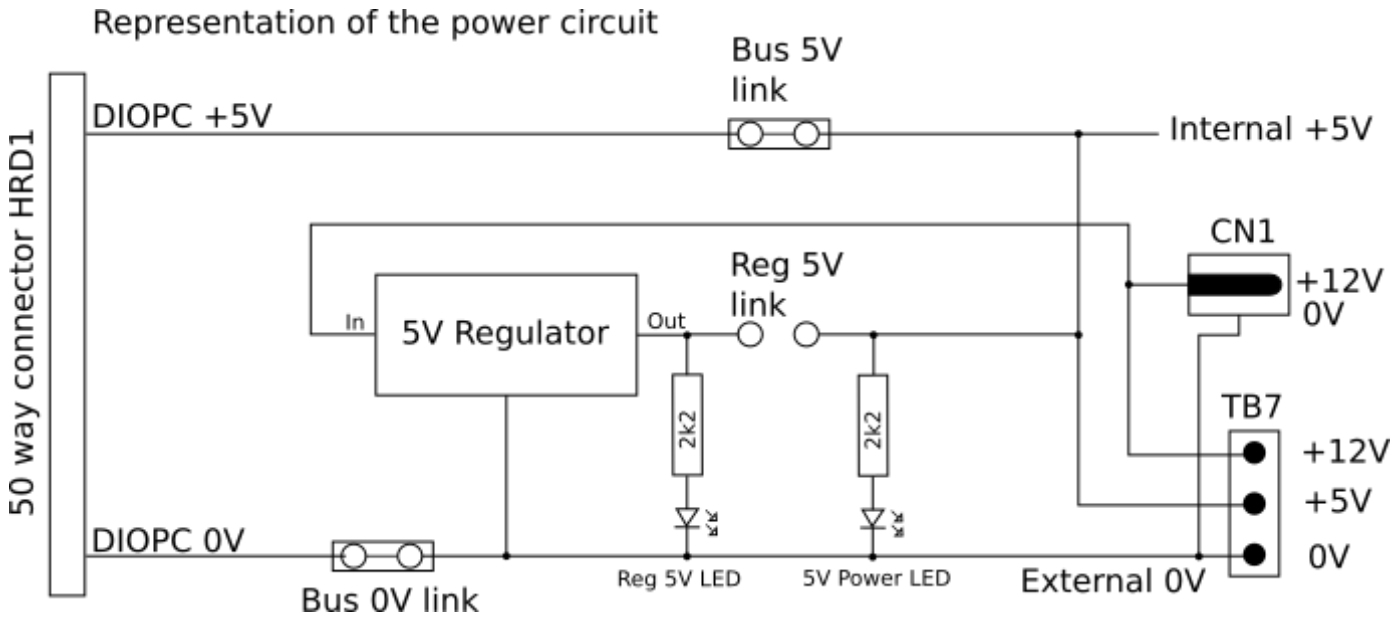


Figure 3. Representation of power circuits.

The 5V regulator is available to power the internal circuits and provide full opto-isolation of the relays by disconnecting the "Bus 0V link" and "Bus 5V link" and by connecting the "Reg 5V link". In this mode the 5V regulator can provide up to 60mA to an external circuit through the +5V connection on TB7.

Differences between version 3 (EDQ-PCB-001-3) and version 4 (EDQ-PCB-001-4) boards:

Version 3 boards use 0.4mm, 2oz/ft^2 copper tracking between the relays and the terminal blocks to be compatible with previous versions.

Version 4 boards use 0.6mm, 2oz/ft^2 copper tracking between the relays and the terminal blocks to increase the current carrying capacity to 4A.

Table of Temperature rise of track with current :

Board version	Calculated temperature rise[1]		Measured temperature rise[2]	Notes
EDQ-PCB-001-3	3A	25 °C	TBD	
	4A	48 °C	TBD	
EDQ-PCB-001-4	3A	12 °C	TBD	
	4A	25 °C	TBD	

[1] Using http://www.circuitcalculator.com/wordpress/2006/01/31/pcb-trace-width-calculator/
[2] Temperature measured central to high current tracking with all relays carrying the stated current.

Please note that an increased current capacity 10A design should be possible but would require design time and an increase in cost. Contact EasyDAQ for further information.

Document versions

Version	Date	Notes
1.0	2nd February 2021	Original