

CIO-ERB48 Datasheet

Electromechanical Relay (Form C) Accessory for MCC Digital I/O Boards



Overview

The CIO-ERB48 provides 48 single pole, double throw (SPDT) Form C electromechanical relays on a 17" x 4.5" circuit board. A single connector scheme allows interfacing this 48-channel relay accessory to any Measurement Computing Corporation (MCC) digital I/O board with 50-pin or 100-pin connectors

Interface to DIO Boards

The CIO-ERB48 is compatible with MCC digital I/O boards such as the USB-DIO96H/50, PCI-DIO48H, and PCI-DIO96H.

Powered from the PC

The CIO-ERB48 does not require 110 VAC power. This board runs from the +5 V computer power supply or from an external +5 V supply. Power is connected through a four-pin MOLEX connector, just like that found on all PC power supplies.

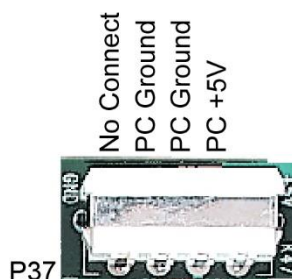


Figure 1. Molex connector (P37) pin assignments

Screw Terminal Wiring

The CIO-ERB48 has screw terminals for connecting field wiring to the relays. Each relay has three terminals: Common (C), Normally Open (NO) and Normally Closed (NC). The screw terminals are high-quality jaw types that do not bind when removing wires. Wire gauges 12-22 AWG are recommended. The CIO-ERB48 has a maximum current of 4.3 A.



Figure 2. Typical relay channel

50-pin I/O Connector

The CIO-ERB48 is designed for high-density applications. Because 48 electromechanical relays fit on one board, all 48 digital I/O lines of a DIO48 are needed to switch the relays. It is not practical to use a CIO-ERB48 with a 24-bit digital I/O board, so there is no provision for 37-pin connectors.

The 50-pin connector is laid out in the style of all MCC 50-pin and 100-pin digital I/O connectors, so you can use the CIO-ERB48 with compatible MCC digital I/O boards.

GND	50	●	●	49	N/C
RELAY 17	48	●	●	47	RELAY 18
RELAY 19	46	●	●	45	RELAY 20
RELAY 21	44	●	●	43	RELAY 22
RELAY 23	42	●	●	41	RELAY 24
RELAY 9	40	●	●	39	RELAY 10
RELAY 11	38	●	●	37	RELAY 12
RELAY 13	36	●	●	35	RELAY 14
RELAY 15	34	●	●	33	RELAY 16
RELAY 1	32	●	●	31	RELAY 2
RELAY 3	30	●	●	29	RELAY 4
RELAY 5	28	●	●	27	RELAY 6
RELAY 7	26	●	●	25	RELAY 8
RELAY 41	24	●	●	23	RELAY 42
RELAY 43	22	●	●	21	RELAY 44
RELAY 45	20	●	●	19	RELAY 46
RELAY 47	18	●	●	17	RELAY 48
RELAY 33	16	●	●	15	RELAY 34
RELAY 35	14	●	●	13	RELAY 36
RELAY 37	12	●	●	11	RELAY 38
RELAY 39	10	●	●	9	RELAY 40
RELAY 25	8	●	●	7	RELAY 26
RELAY 27	6	●	●	5	RELAY 28
RELAY 29	4	●	●	3	RELAY 30
RELAY 31	2	●	●	1	RELAY 32

Figure 3. 50-pin connector pinout

Connections

Relay number association with 8255 digital I/O ports on compatible MCC device:

- RELAY 1 to 8 correspond to FIRSTPORTA bits 0 to 7
- RELAY 9 to 16 correspond to FIRSTPORTB bits 0 to 7
- RELAY 17 to 24 correspond to FIRSTPORTC bits 0 to 7
- RELAY 25 to 32 correspond to SECONDPORTA bits 0 to 7
- RELAY 33 to 40 correspond to SECONDPORTB bits 0 to 7
- RELAY 41 to 48 correspond to SECONDPORTC bits 0 to 7

All Form C Relays

The CIO-ERB48 has SPDT Form C relays, with each relay having three terminals.

- The center terminal is the Common (C) terminal. This terminal is switched between the other two.
- The Normally Closed (NC) terminal is in contact with the Common (C) terminal whenever the CIO-ERB48 is powered up, reset, or when a 0 is written to the controlling bit of the digital I/O board.
- The Normally Open (NO) terminal is in contact with the Common (C) terminal whenever a 1 is written to the controlling bit of the digital I/O board.

Buffers and Pull-Downs

The CIO-ERB48 inputs from the digital I/O board are pulled to a steady state by circuitry on the board, so they do not randomly open or close on power-up. Also, buffer/ drivers on board accept signals from simple 8255 type digital I/O boards.

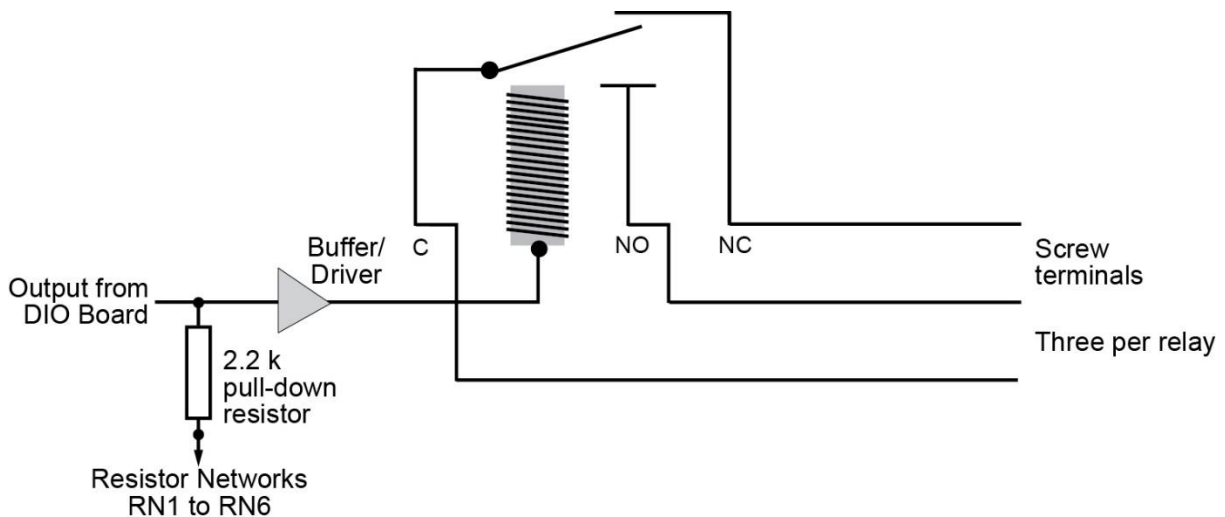


Figure 4. CIO-ERB48 relay configuration

Specifications

All specifications are subject to change without notice.

Typical for 25 °C unless otherwise specified.

Specifications in italic text are guaranteed by design.

Relay Input Specifications

Number of Channels	48
Contact Configuration	1 FORM C (SPDT), NO, NC, and Common available at connector
Contact Rating	4.3 A @ 30 VAC or 28 VDC resistive ¹
Contact Resistance	100 mΩ max
Operating Time	10 ms max
Release Time	5 ms max
Vibration	10 Hz to 55 Hz (dual amplitude 1.5 mm)
Shock	10 G (11 ms)
Dielectric Isolation	Functional isolation
Life Expectancy	10 million mechanical operations, min
Power on RESET state	Not energized. NC in contact to Common

Power Supply Specification

Power Supply	+5 V from a computer power supply or an external +5 V supply connected to the four-pin MOLEX connector
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Screw Terminal Connectors

Wire Sizes	12 – 22 AWG
Allowable Current	4.3 A max

Environmental Specifications

Operating Temperature Range	0 °C to 70 °C
Storage temperature range	–40 °C to 100 °C
Humidity	0% to 90% non-condensing
Hazardous locations	Not certified for use in hazardous locations.

¹ Maximum allowable voltage connection to the CIO-ERB48 is 30VAC/28VDC; not certified for use with hazardous voltages.

Software Options

The CIO-ERB48 is an accessory board compatible with MCC digital I/O boards, such as the USB-DIO96H/50, PCI-DIO48H, and PCI-DIO96H which use the following MCC software:

- **InstaCal**
- **Universal Library for Windows**
- **Universal Library for Linux** (PCI-DIO48H and PCI-DIO96H are not supported)
- **ULx for NI LabVIEW**
- **DAQami** (PCI-DIO48H and PCI-DIO96H are not supported)

Ordering Information and Purchasing Options

Digilent Part Numbers:

- 6069-410-203 – CIO-ERB48
 - Molex 4-pin Male-to-Female Power Cable, 10 ft, 18 AWG

Additional Resources

Reference materials are available on Digilent's Reference site (<https://digilent.com/reference>).

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