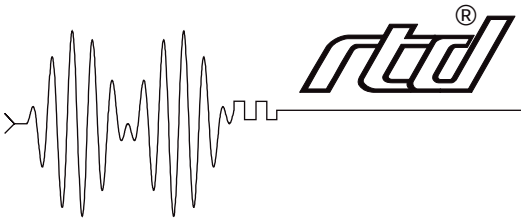
DMR24
Mechanical Relay Output Board
User's Manual



Real Time Devices USA, Inc.

"Accessing the Analog World"™

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DMR24

User's Manual

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INTRODUCTION

The DMR24 mechanical relay output board provides 8, 16, or 24 electromechanical single-pole, double-throw relays for general-purpose switching applications. Driven by the digital output lines available on Real Time Devices' opto-22 compatible digital control boards, the DMR24 features:

- 8, 16, or 24 SPDT relays with 120-volt/2A rating,
- On-board relay driver circuits,
- LED indicators to monitor relay activity,
- Direct compatibility with DIO24, DIO48, DM5802, DM5804 & DM5808 digital control boards,
- On-board screw terminals for easy wiring.

What Comes With Your Board

You receive the following items in your DMR24 package:

- DMR24 mechanical relay output board with 8, 16, or 24 relay output channels (customer specified)
- User's manual

If any item is missing or damaged, please call Real Time Devices' Customer Service Department at (814) 234-8087. If you require service outside the U.S., contact your local distributor.

In addition to the items included in your DMR24 package, Real Time Devices offers a full line of board accessories, including the TB50 terminal board and XB50 prototype/terminal board which can be connected to the daisy chain connector for prototype development and easy signal access.

Using This Manual

This manual is intended to help you get your new board running quickly, while also providing enough detail about the board and its functions so that you can enjoy maximum use of its features even in the most complex applications. We assume that you already have an understanding of data acquisition and control principles and that you can provide the software necessary to control the DMR24 board.

When You Need Help

This documentation package should provide enough information for you to achieve your desired results. If you have any problems using this board, contact our Technical Support Department, (814) 234-8087, during regular business hours, eastern standard time or eastern daylight time, or send a FAX requesting assistance to (814) 234 5218. When sending a FAX request, please include your company's name and address, your name, your telephone number, and a brief description of the problem.

Board Settings

The DMR24 board has jumper settings you can change if necessary for your application. The factory settings are listed in this section. Should you need to change these settings, use these easy-to-follow instructions. Figure 1 shows the board layout.

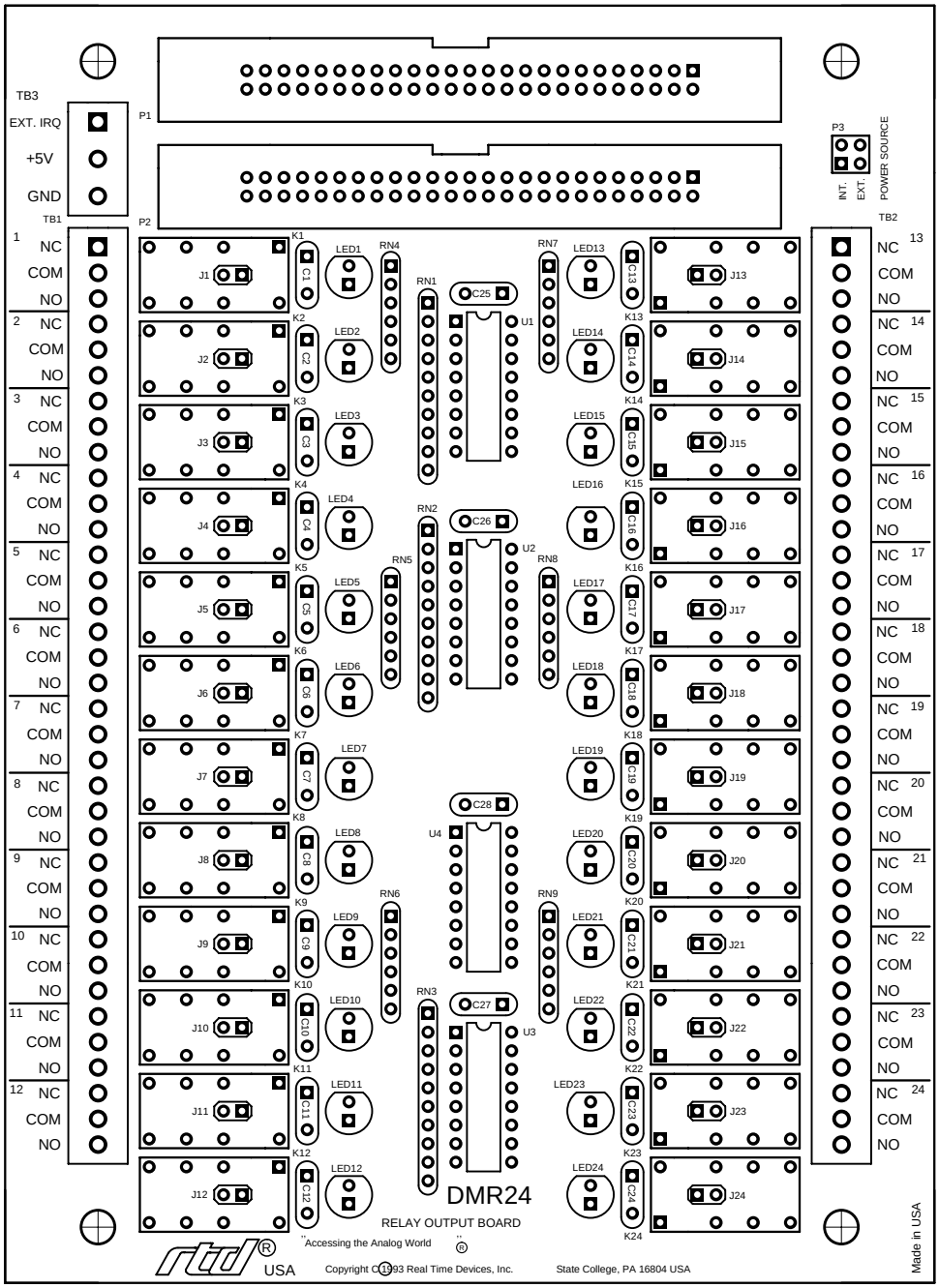

Fig. 1 — DMR24 Board Layout

P3 — Internal/External Power Source, +5 Volts (Factory Setting: +5V INT.)

Header connector P3, shown in Figure 2, lets you select the power source for the DMR24. Each relay consumes about 80 mA when energized, so the maximum current requirement for all relays energized simultaneously is about 1.92 A. Taking this much current from the computer's +5 volt power bus could overload the PC's +5 volt supply if you have other circuitry drawing high current (such as two or three DMR24 boards daisy chained). P3 lets you jumper to an external +5 volt power supply. The external power source is connected to the DMR24 board at TB3, +5V and GND, located in the upper left area of the board.

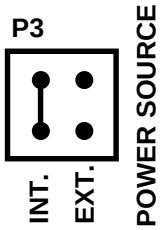

Fig. 2 — Internal/External Power Source Jumper, P3

J1 Through J24 — Bypass Jumper

These jumpers allow you to bypass the relay circuit when a relay is not installed so that the digital control signal is available at the corresponding DMR24 terminal. Jumpers are installed at the factory in all unused relay positions on 8- and 16-relay boards.

TB3-1 — EXT. IRQ External Interrupt

This terminal on TB3 provides direct access to the external interrupt signal available at pin 2 on the digital control board's I/O connector.

Connecting to the opto-22 Digital Control Board

Figure 3 shows the DMR24's P1 I/O connector pinout, with all of the pins used by the DMR24 board labeled. The DMR24 is pin-for-pin compatible with all Real Time Devices' opto-22 compatible boards, including the DIO24, DIO48, DM5802, DM5806, and DM5808. The table below shows the relationship of the DIO board signals to the DMR board relays.

DMR24 Board/opto-22 Compatible Board Cross Reference

DMR24 Relay	DMR24 Signal	opto-22 Signal		DMR24 Relay	DMR24 Signal	opto-22 Signal		DMR24 Relay	DMR24 Signal	opto-22 Signal
K1	DIN0	PA0		K9	DIN8	PC0		K17	DIN16	PB4
K2	DIN1	PA1		K10	DIN9	PC1		K18	DIN17	PB5
K3	DIN2	PA2		K11	DIN10	PC2		K19	DIN18	PB6
K4	DIN3	PA3		K12	DIN11	PC3		K20	DIN19	PB7
K5	DIN4	PA4		K13	DIN12	PB0		K21	DIN20	PC4
K6	DIN5	PA5		K14	DIN13	PB1		K22	DIN21	PC5
K7	DIN6	PA6		K15	DIN14	PB2		K23	DIN22	PC6
K8	DIN7	PA7		K16	DIN15	PB3		K24	DIN23	PC7

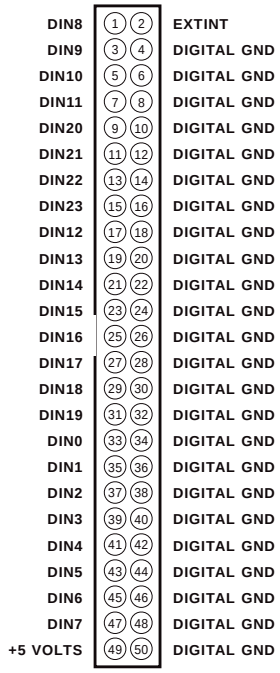

Fig. 3 — P1 I/O Connector Pin Assignments

To further expand the number of relays you can control using your digital I/O lines, you can use the daisy chain connector on the DMR24 board, P2. The signals at this connector are identical to the pinout of your opto-22 compatible digital control board. You can connect to another DMR24 (each digital output line will now control two relays, one on each DMR24 board), or to a TB50 or XB50 breakout board to easily access all of the digital control board signals. Our technical staff will gladly help you select the accessories you need for your application.

Connecting to the Signal Sources

One digital output line from your opto-22 compatible digital control board is required to control each relay. These lines are labeled DIN0 through DIN23 on the DMR24 P1 connector pinout because they are inputs to the DMR24 board. These lines are programmed through your digital control board. For normally open operation of your relay, the relay is open when the control line is low and closed when the control line is high. For normally closed operation, the relay is closed when the control line is low and open when the control line is high. When the relay is energized, its LED status indicator lights. Since your digital control board's digital I/O is provided by an 8255 programmable peripheral interface (PPI), you must set up the lines that you use for the DMR24 as mode 0 outputs. The interface board manual tells you how to set up the PPI.

TB1 and TB2 are 36-terminal miniature screw terminal strips which let you easily connect and disconnect the relay outputs to external devices. When operating the relay as a normally open switch (open = low and closed = high), connect the external device the relay is controlling to the NO terminal screw and the ground to the COM terminal screw for the selected channel. When operating the relay as a normally closed switch (closed = low and open = high), connect the external device to the NC terminal screw and the ground to the COM screw terminal. If no relay is installed and you have used a jumper in a corresponding J position, the digital I/O signal from the digital control board is directly available at the terminal strip. To access the signal, connect to the COM and GND (a GND is available on TB3). Figure 4 shows a diagram of the channel 1 (DIN0) relay circuit.

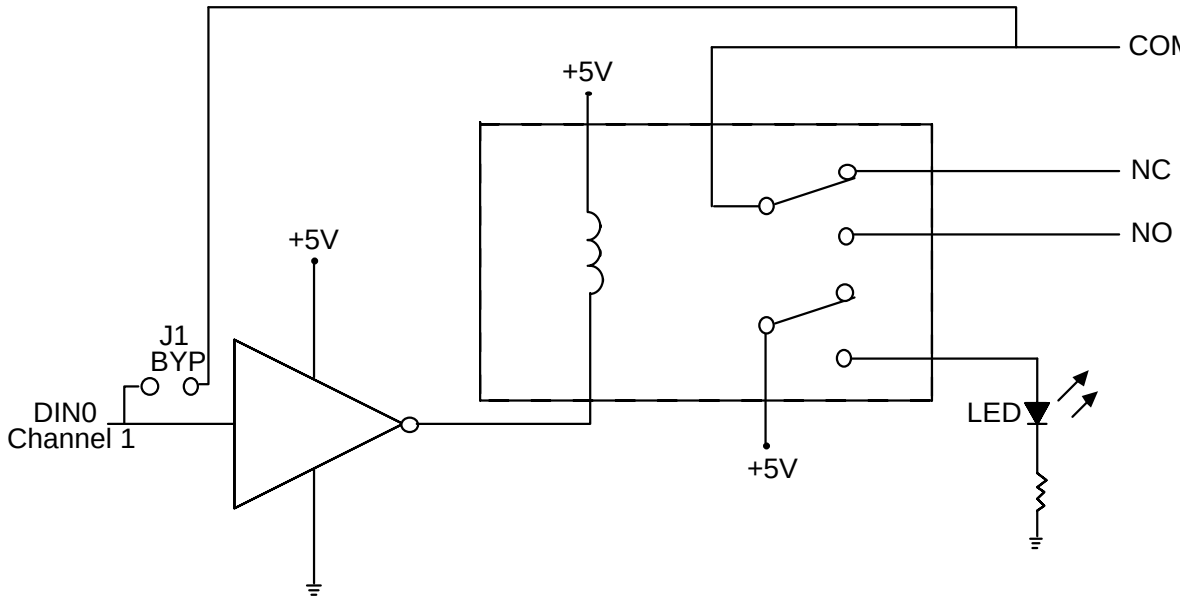

Fig. 4 — DMR24 Relay Circuit Diagram

APPENDIX A

DMR24 SPECIFICATIONS

DMR24 Characteristics Typical @ 25° C

Relay

Type ..... SPDT (Form C)
Contact rating ..... 120 Vac/Vdc, 2 A
Breakdown voltage ..... 1500 Vac/Vdc, min
'ON' time ..... 3 msec, typ
'OFF' time ..... 2 msec, typ
Switching time ..... 10 msec, typ
Insulation resistance ..... >100 Mý
Life expectancy ..... over 5 million operations at full load

Current Requirements

+5 volts ..... 80 mA per relay; 1.92 A with all relays energized

Power Requirements

+5 volts ..... From computer or external power supply

Connectors

Two 50-pin right angle shrouded box headers

Screw Terminals

TB1 and TB2 - 36-terminal; TB3 - 3-terminal
22-12 AWG wire

Size

6.875"L x 5.0"W (175mm x 127mm)

APPENDIX B

WARRANTY

LIMITED WARRANTY

Real Time Devices, Inc. warrants the hardware and software products it manufactures and produces to be free from defects in materials and workmanship for one year following the date of shipment from REAL TIME DEVICES. This warranty is limited to the original purchaser of product and is not transferable.

During the one year warranty period, REAL TIME DEVICES will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to REAL TIME DEVICES. All replaced parts and products become the property of REAL TIME DEVICES. **Before returning any product for repair, customers are required to contact the factory for an RMA number.**

THIS LIMITED WARRANTY DOES NOT EXTEND TO ANY PRODUCTS WHICH HAVE BEEN DAMAGED AS A RESULT OF ACCIDENT, MISUSE, ABUSE (such as: use of incorrect input voltages, improper or insufficient ventilation, failure to follow the operating instructions that are provided by REAL TIME DEVICES, “acts of God” or other contingencies beyond the control of REAL TIME DEVICES), OR AS A RESULT OF SERVICE OR MODIFICATION BY ANYONE OTHER THAN REAL TIME DEVICES. EXCEPT AS EXPRESSLY SET FORTH ABOVE, NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND REAL TIME DEVICES EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED HEREIN. ALL IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES FOR MECHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS WARRANTY. IN THE EVENT THE PRODUCT IS NOT FREE FROM DEFECTS AS WARRANTED ABOVE, THE PURCHASER’S SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. UNDER NO CIRCUMSTANCES WILL REAL TIME DEVICES BE LIABLE TO THE PURCHASER OR ANY USER FOR ANY DAMAGES, INCLUDING ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EXPENSES, LOST PROFITS, LOST SAVINGS, OR OTHER DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT.

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THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.