PMDX-104
4-Channel Relay Output Board

User's Manual

Document Revision: 1.0

Date: 23 February 2010

Table of Contents

1.0   Overview

This document describes the configuration and operation of the PMDX-104 4-Channel Relay Output Board. The PMDX-104 4-Channel Relay Output Board is useful for providing low-speed isolated control signals, or for controlled moderate loads as an add-on to a standard break-out board.

1.1   Important Safety Information

The PMDX-104 4-Channel Relay Output Board is intended for integration by the purchaser into industrial control systems. It is solely the purchaser's responsibility to assure that the system is configured in a manner consistent with applicable safety requirements. Practical Micro Design, Inc. does not control how these parts are integrated into the purchaser's system and cannot be responsible for guaranteeing the safety of your system.

The PMDX-104 4-Channel Relay Output Board is not guaranteed to be fail-safe. The system into which the PMDX-104 4-Channel Relay Output Board is installed should provide fail-safe protection and emergency stop capability.

Automated machine tools, into which the PMDX-104 4-Channel Relay Output Board may be integrated, can cause injury. Precautions should be taken to assure that operators are trained in their proper operation and safety procedures, and that they are protected from moving parts that may be under remote control and may move unexpectedly.

This product may not be used in life support or other critical safety applications.

1.2   Warranty Summary

The PMDX-104 4-Channel Relay Output Board is warranted against failure due to defective parts or workmanship for 90 days from the date of sale. Refer to Appendix A for complete warranty details.

> **NOTE:** If you have an item requiring service, please see the "Warranty and Repairs" page on the PMDX web site (http://www.pmdx.com) for return instructions.

In general, the purchaser must pay shipping to send the unit to PMDX. For repairs covered under warranty and with return shipping to a USA address PMDX will ship the repaired unit back to you via ground transportation at our expense. Repairs are normally completed within 10 business days. See Appendix A for our complete warranty details. **Please see the "Warranty and Repairs" page on our web site (http://www.pmdx.com) for full details of our repair and shipping policies.**

1.3   Features

The PMDX-104 4-Channel Relay Output Board has the following features:

- Electromechanical relay outputs support AC or DC loads up to 5 amperes maximum

- Outputs can provide isolated "switch closures" to control VFD's (variable frequency drives) or drive 24 volt DC inputs for PLC's (programmable logic controllers)

- Outputs protected from spikes when turning off inductive loads

- LED indicators on each channel

- Clamp style screw terminal strips for inputs and outputs allow use with any breakout board

- Logic level control inputs (5 volt TTL or CMOS)

- Inputs have default pull-down resistors so unconnected inputs turn the relays off

- Requires 5 volts power, can be powered directly by PMDX-125

- Can be used with other brands of break-out boards

1.4   Updates to this Manual

Check the PMDX web site for revisions or updates to this manual (http://www.pmdx.com). The latest revision of this manual is available on the PMDX-104 4-Channel Relay Output Board page (follow the links from the main page).

2.0   Installation and Operation

Note that all PMDX breakout boards have sufficient +5V power available to power the PMDX-104 and output signals of sufficient drive strength to drive the relay control inputs.

Connectors J1, J2, J3 and J4 provide the "normally open" (NO) contacts from each of the four relays.

The PMDX-104's input signal connector is configured so that the signals line up with either of the PMDX-125's output connector (PMDX-125 connectors J5 and J6). This allows you to place the PMDX-104 next to the PMDX-125 and run wires directly between the two connectors.

Pin Label	Description
+5V	+5VDC regulated power supply input
"A"	Relay "A" control input
"B"	Relay "B" control input
"C"	Relay "C" control input
"D"	Relay "D" control input
PCgnd	Ground (power supply return)

Table 1 – Input Signal Connector Pin-Out (J5)

> **NOTE:**   The PMDX-104 does not implement a "charge pump" or E-Stop. If your application requires that the relay outputs be disabled by a "charge pump" or E-Stop, then the board driving the signals to the PMDX-104 must implement the "charge pump" and/or E-Stop function. The board should then disabled the signals to the PMDX-104 (i.e. drive them low) when it detects a "charge pump" failure or E-Stop condition.

2.1   Connecting to a PMDX-125

Note:
Similar connections can be made to the PMDX-125 connector J6.
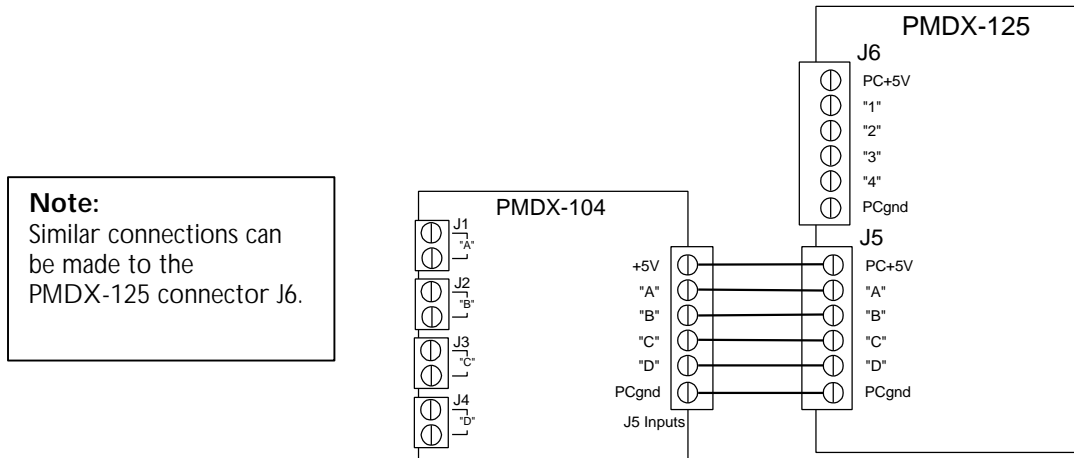
Figure 1 - PMDX-104 to PMDX-125 (J5) Connections

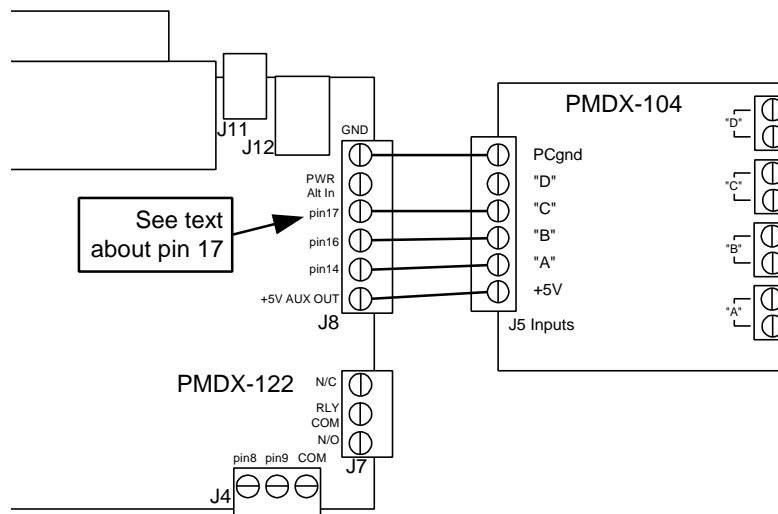## 2.2   Connecting to a PMDX-122

See text about pin 17

Figure 2 - PMDX-104 to PMDX-122 Connections

NOTE: In order to power the PMDX-104 from the PMDX-122, the PMDX-122 must be powered from a 9 to 12V AC or DC power supply or a regulated +5V supply. You cannot power the PMDX-104 from a PMDX-122 when the PMDX-122 is powered from a USB port.

WARNING –   *If you have parallel port pin 17 configured as a "charge pump" signal, you MUST configure the PMDX-122 to output "CP OK" (charge pump OK) on its pin 17 output in order to connect this pin to the PMDX-104. Please refer to the PMDX-122 User's Manual for more information on configuring the "pin 17" output.*

Connecting the pin 17 output to the PMDX-104 when pin 17 is the "raw" charge pump signal will cause erratic operation of the PMDX-104 relay.

2.3 Connecting to a PMDX-132

The following diagram shows the PMDX-104 connected to a PMDX-132. Note that the PMDX-132 has two on-board relays that can be enabled or disabled via jumpers. When enabled these PMDX-132 relays are controlled by parallel port pins 1 and 14. If the PMDX-104 is connected to the PMDX-132 for parallel port pins 1 and 14 (as shown by the dotted lines), and the PMDX-132 relays are enabled, then the relays on the PMDX-104 will operate in parallel with the relays on the PMDX-132. This can be useful if you need to switch two separate circuits with a single parallel port pin.

> *WARNING –* *If you have parallel port pin 17 configured as a "charge pump" signal, you MUST configure the PMDX-132 to output "CP OK" (charge pump OK) on its pin 17 output in order to connect to the PMDX-104. Please refer to the PMDX-132 User's Manual for more information on configuring the "pin 17" output.*
>
> *Connecting the pin 17 output to the PMDX-104 when pin 17 is the "raw" charge pump signal will cause erratic operation of the PMDX-104 relay.*
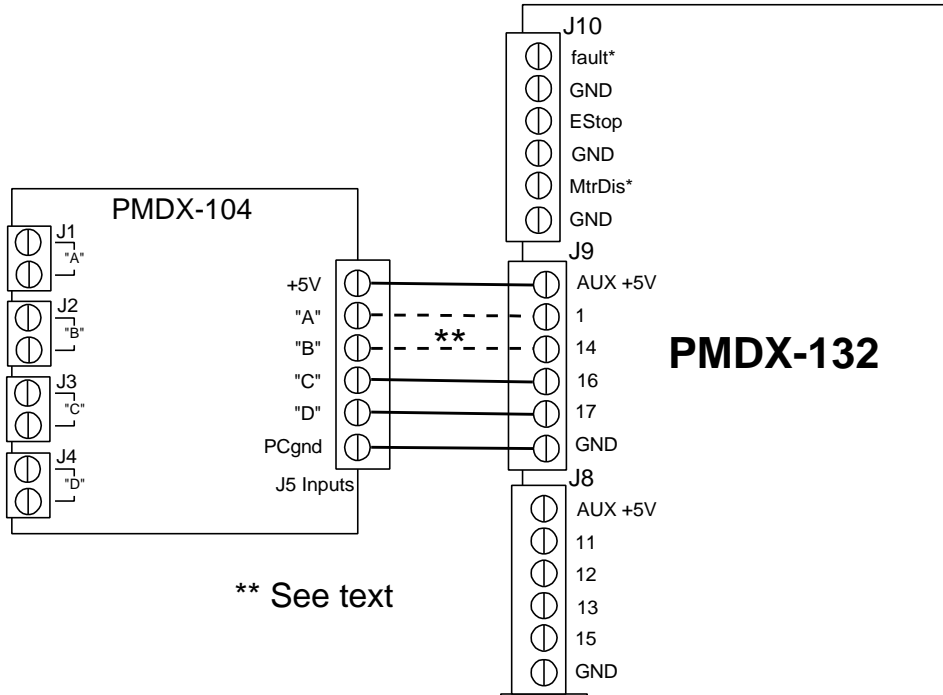

Figure 3 - PMDX-104 to PMDX-132 Connections

3.0 Mechanical Specifications

4 each holes for #6
screen to mount board

← 2.500" →

2.325"

0.175" →

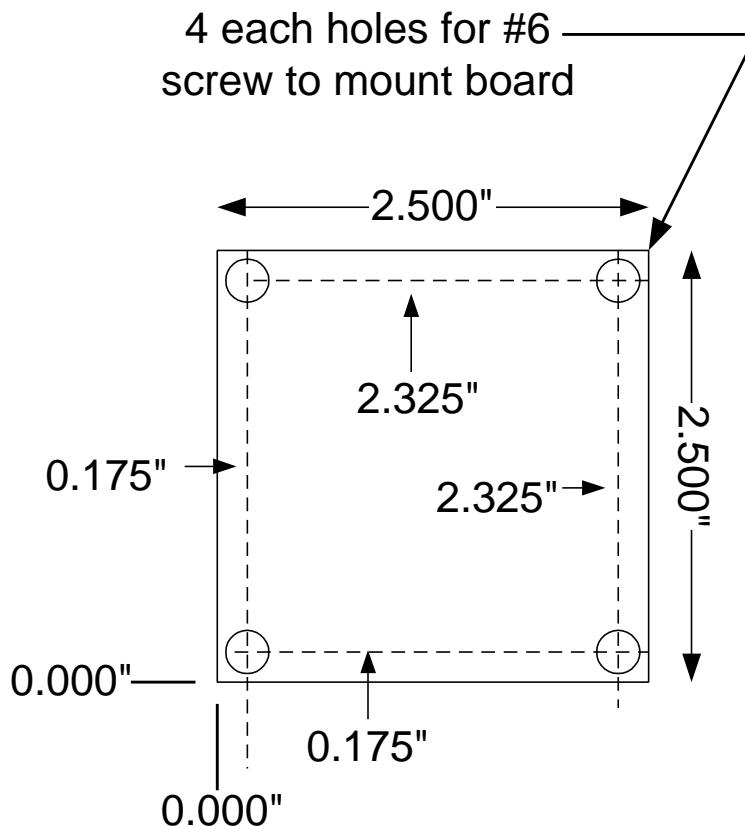2.325" →

2.500"

0.000"

0.175"

0.000"

Figure 4 - PMDX-104 4-Channel Relay Output Board Dimensions

> *WARNING:* *The PMDX-104 4-Channel Relay Output Board should be protected from liquids, dirt, or chips (especially metal chips which can cause shorts) coming in contact with the board.*

4.0 Electrical and Environmental Specifications

Power Supply: +5V DC input, 100mA maximum

Relay Contacts: 5 Amperes maximum
250VAC or 30VDC maximum

Environmental: Temperature: 0° to +55° C
Relative Humidity: 20% to 80% relative humidity, non-condensing

Appendix A – Warranty

Statement

Practical Micro Design, Inc. (PMD) warrants that this hardware product is in good working condition, according to its specifications at the time of shipment, for a period of 90 days from the date it was shipped from PMD. Should the product, in PMD's opinion, malfunction within the warranty period, PMD will repair or replace the product without charge. Any replaced parts become the property of PMD. This warranty does not apply to the software component of a product or to a product which has been damaged due to accident, misuse, abuse, improper installation, usage not in accordance with product specifications and instructions, natural or personal disaster or unauthorized alterations, repairs or modifications.

Limitations

All warranties for this product, expressed or implied, are limited to 90 days from the date of purchase and no warranties, expressed or implied, will apply after that period.

All warranties for this product, expressed or implied, shall extend only to the original purchaser.

The liability of Practical Micro Design, Inc. in respect of any defective product will be limited to the repair or replacement of such product. Practical Micro Design, Inc. may use new or equivalent to new replacement parts.

Practical Micro Design, Inc. makes no other representations or warranties as to fitness for purpose, merchantability or otherwise in respect of the product. No other representations, warranties or conditions, shall be implied by statute or otherwise.

In no event shall Practical Micro Design, Inc. be responsible or liable for any damages arising
- (a) from the use of the product;
- (b) from the loss of use of the product;
- (c) from the loss of revenue or profit resulting from the use of the product; or
- (d) as a result of any event, circumstance, action or abuse beyond the control of Practical Micro Design, Inc.

whether such damages be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.