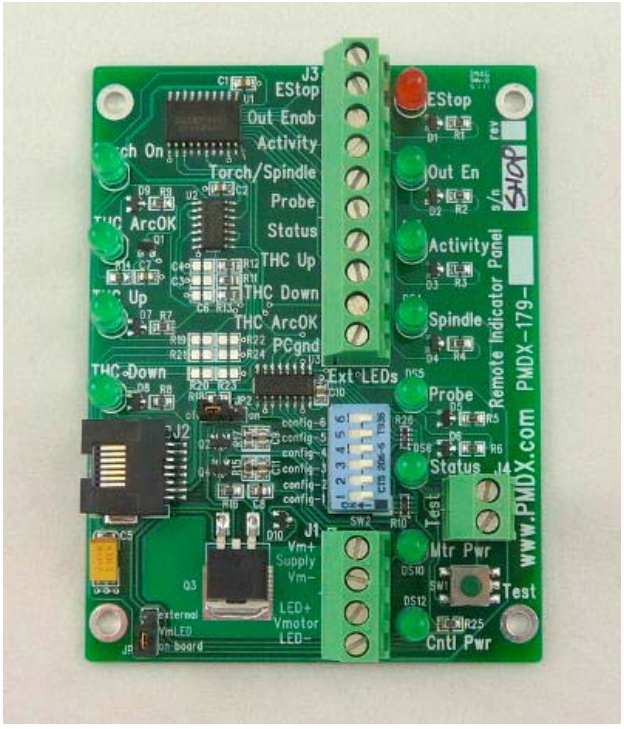
PMDX-179

Remote Status Indicator Board

User's Manual



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1.0 Overview

This document describes the configuration and operation of the Remote Status Indicator Board. The PMDX-179 connects to a PMDX-126 Revision B Breakout Board (or other, future PMDX product) and provides remote indicators for various system status.

1.1 Important Safety Information

The PMDX-179 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 this board is integrated into the purchaser's system and cannot be responsible for guaranteeing the safety of your system.

The PMDX-179 is not guaranteed to be fail-safe. The system into which the PMDX-179 is installed should provide fail-safe protection and emergency stop capability.

The PMDX-179 contains circuitry that may be connected to dangerous voltages. Care must be taken that user cannot come in contact with these voltages. An enclosure that allows for modest ventilation, but prevents intrusion by operator's hands and foreign objects, especially conductive byproducts of machining operations, should be utilized with this board. Interlock switches on power circuits should remove power when the enclosure is opened.

Automated machine tools, into which the PMDX-179 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-179 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.

If you have an item requiring service, please see the support page on the PMDX web site (http://www.pmdx.com) for return instructions.

The purchaser must pay shipping to return the unit to PMDX. We 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.

1.3 Trademarks

The following product names used in this manual are the trademark, tradename or registered mark of the respective companies:

Product Names	***Company***
PMDX-126, PMDX-107	PMDX/Practical Micro Design, Inc. (http://www.pmdx.com)

1.4 Features

The PMDX-179 has the following features:

General:

- Can be used the PMDX-126 revision B or later, and with future boards that include remote indicator support
- Provides for remote Test/Reset button
- Provides extra DIP switches for use with future controller enhancements
- Connects using a standard RJ-45 Ethernet style cable
- Connections for DC motor supply sensing, optional external indicators, or relays are made using a clamp screw style terminal strip

Panel Version:

- Panel version with 5mm LEDs requires no power source other than a connection to the controller board

External Indicator Version:

- Optional PMDX-179-EXT version for external indicators can drive up to 0.1 ampere at 24 VDC for LED type industrial indicators, LED type signal light towers, or for relays to operate incandescent indicators or other loads (requires external power for indicators or relays)

Indicators for:

- E-Stop
- Outputs Enabled
- Step Activity
- Spindle ON
- Probe Triggered
- Breakout board/controller board status (as codes flashed on indicator)
- Motor power present (detects 24 - 80 VDC on a terminal strip connection)
- Breakout board/controller power ON

1.5 Updates to this Manual

Check the PMDX web site (http://www.pmdx.com) for updates to this manual and for related application notes. The latest revision of this manual is available on the PMDX-179 page (follow the links from the main page).

2.0 Quick Setup Guide

2.1 Assembly steps

1. Make sure that your controller board (PMDX-126 or other compatible controller board) is configured and functioning properly.
2. Power off the controller board and, if using the "motor power" LED, power off the motor power supply.
3. Connect the PMDX-179 to the controller board using a standard CAT5 Ethernet cable. See section 2.2.
4. Set jumper PMDX-179 jumper JP1 to "on board" (even if you plan to use an external motor power indicator).
5. Determine the necessary setting for PMDX-179 jumper JP2 for your spindle configuration. See section 2.3 for more information.
6. Power on the controller board and optionally your motor power supply.
7. [OPTIONAL if using an external motor power indicator] After you have verified that the on-board motor power LED functions with your motor power supply, turn off the controller board and the motor power supply. Connect your external indicator to the terminals on connector J1 (see section 6.1). Power the controller board and motor power supply back on an verify that your external indicator functions.

2.2 Example Configuration with PMDX-126

The PMDX-179 connects to a PMDX-126 Revision B or later board (or future PMDX products that include remote indicator support) using a standard CAT5 or CAT6 Ethernet cable. See diagram below.

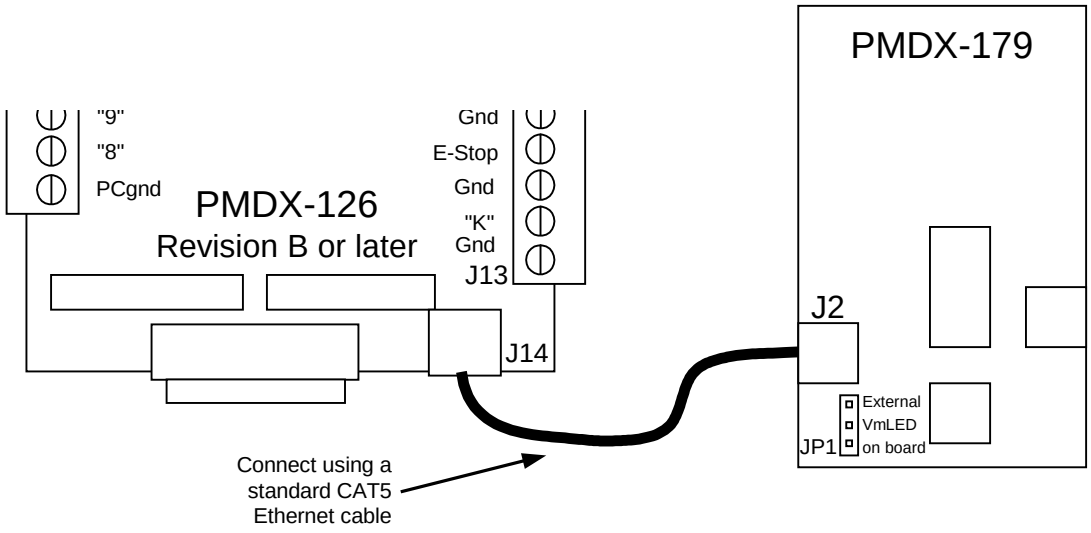

Figure 1 – PMDX-179 connected to a PMDX-126

2.3 Determining Spindle Control Source

If you are using automated control of the spindle on your machine, please see the description of jumper JP2 in section 4.0 to select the source of the spindle control signal. If you do ***not*** have the spindle under automatic control (i.e. you start and stop the spindle by hand), configure jumper JP2 as if parallel port 1 pin 1 were controlling the spindle, and then ignore the "spindle" LED.

3.0 DIP Switches

The PMDX-179 contains 6 DIP switches, labeled "config-1" through "config-6'. Currently these switches are ignored by the PMDX-126 board. For compatibility with future products or future revisions of the PMDX-126, keep the DIP switches towards the "on" position. See figure 2 below for more information.

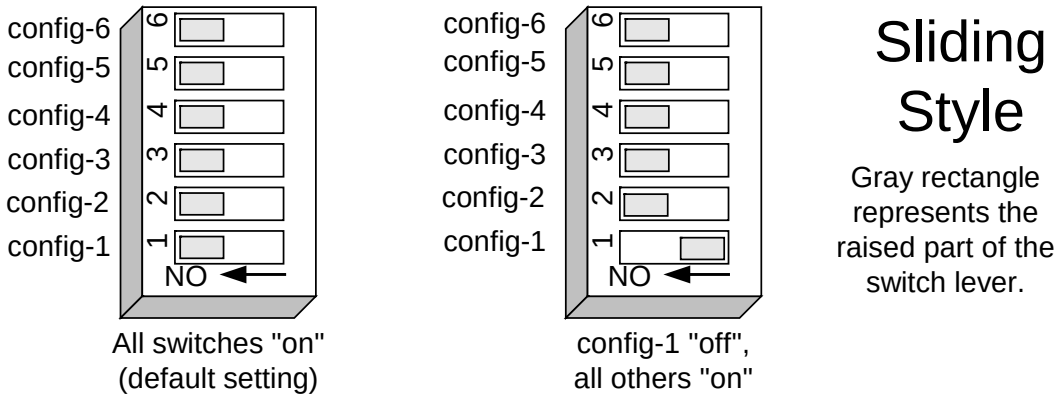

Figure 2 – Sample DIP Switch settings

4.0 Jumpers

The PMDX-179 has two jumpers:

JP1 Determines whether to use the on-board "motor power" LED or and external LED connected to connector J1. See table 1 below and section 6.1 for more information.

JP2 Determines how the PMDX-126 (or other, compatible controller board) determines when the spindle is running. This is only for the purposes of turning the "Spindle" LED on and off. This does not change how the spindle is controlled by the PC. See table 2 below for more information.

Pins	*Label*	*Function of JP1*
1-2	on board	Use on-board motor power LED (reference designator DS10)
2-3	external	Use external motor power LED or indicator (the PMDX-179 current-limits this output to 20 mA, see section 6.1 for more information).

Table 1 - Jumper JP1 Settings (Motor Power LED)

Pins	*Label*	*Function of JP2*
1-2	on	PMDX-126 monitors parallel port 1 pin 1 to determine when the spindle is running (and presumes that port 1 pin 1 is "active high").
2-3	off	PMDX-126 monitors its expansion connector (J18 – usually with a PMDX-107 installed) to determine when the spindle is running. ***DO NOT USE THIS SETTING UNLESS A PMDX-107 IS INSTALLED ON THE PMDX-126!*** Without a PMDX-107 installed, this setting will cause incorrect behavior of the "Spindle" signal.

Table 2 - Jumper JP2 Settings (Spindle Status Source)

5.0 Test Button

The push-button switch labeled "Test" functions the same of the "Test" button on the PMDX-126, or other supported interface board that includes support for remote indicators. Please see the user's manuals for those boards for more information on their "Test" buttons.

6.0 Connectors

The PMDX-179 contains the following connectors. Refer to the following sections for details on the pin-outs for each connector. For all connectors, pin "1" is the pin closest to the reference designator (i.e. J1 pin 1 is the pin closest to the "J1" text on the circuit board). In addition, all connectors have square pads on pin 1 (look on the bottom of the circuit board).

Connector	*Description*
J1	Motor power supply monitor and (optional) external motor power LED
J2	Remote Expansion Connector
J3	External LED connector
J4	External "Test" switch connector

Table 3 - Summary of PMDX-179 Connectors

6.1 Motor Power Supply Connector (J1)

This connector provides wire clamp screw terminal connections for your motor power supply (up to 80VDC) to drive the on-board "Motor Power" LED, or to drive an optional external LED.

Pin Number	Label	Description
1	VM+	Motor Supply, positive terminal
2	VM-	Motor supply, negative terminal
3	LED+	(optional) Annode of external motor power LED No external current-limiting resistor is needed. The PMDX-179 limits the current to 20 mA (see section 8.0)..
4	LED-	(optional) Cathode of external motor power LED

Table 4 – Motor Power Indicator Pin-Out (J1)

6.2 Remote Expansion Connector (J2)

Use a standard CAT5 or CAT6 Ethernet cable between this connector and the PMDX-126 (or other future PMDX products). ***DO NOT USE A "CROSS-OVER" CABLE.*** This cable provides power to the PMDX-179 as well as data signals. The pin-out is proprietary.

WARNING: ***THIS IS NOT AN ETHERNET PORT. Do not connect this connector to an Ethernet hub of other Ethernet device or port. Doing so may damage the PMDX-179 and/or the Ethernet device.***

6.3 External Connector (J3)

This connector provides wire clamp screw terminal connections for external LEDs or low-current relays. Each output signal can sink up to 100mA. An example of wiring for LEDs is shown below.

LEDs are shown with current limiting resistors for +24V operation. This is typical for LED signal light towers.

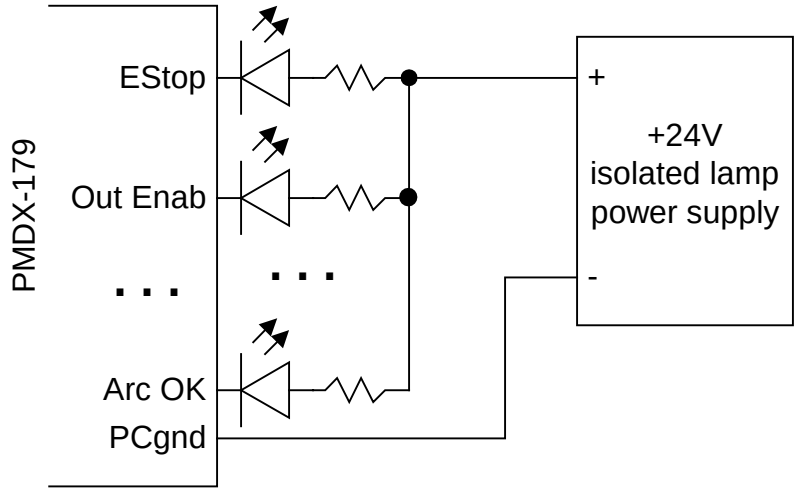

Figure 3 – Sample External LED connection to PMDX-179

NOTE: The lamp power supply ground will be connected to the PC or host device ground through the parallel port connectors of the PMDX-126 or other supported controller board.

Pin Number	Label	Description
1	EStop	E-Stop (Emergency Stop)
2	Out En	Outputs Enabled
3	Activity	Activity (any step pulse or change in direction)
4	Torch/ Spindle	"Torch On" (when installed in a system controlled a PMDX torch height controller) or "Spindle On" LED when installed on a system with spindle control.
5	Probe	Touch probe ***(see note below)***
6	Status	Status (used to signal error conditions on the PMDX-126).
7	THC Up	Torch Height Controller "Up" signal (when installed in a system controller with a PMDX torch height controller, see note below)
8	THC Down	Torch Height Controller "Down" signal (when installed in a system controller with a PMDX torch height controller, see note below)
9	THC ArcOK	Torch Height Controller "Arc OK" signal (when installed in a system controller with a PMDX torch height controller, see note below)
10	PCgnd	Ground reference. Note that this connects to the "PC Ground" on the PMDX-126 boards, which is the same ground as the PC, Smoothstepper or other USB/Ethernet controller.

Table 5 – Motor Disable Connector Pin-Out (J3)

Torch Height Controller Signals Note: The corresponding on-board THC LEDs are only present on THC versions of the PMDX-179.

PROBE Signal Note: The source of the "probe" signal depends on the PMDX-126 (or compatible controller) settings. For example, with the PMDX-126 set for "Probe Merged Inputs" mode, the "probe" signal will be asserted when PMDX-126 connector J11 pin 9 ("H") is ground or +24V, ***OR*** PMDX-126 connector J12 pin 9 ("15") is +5V or floating. When the PMDX-126 is ***not*** in "probe merged inputs" mode, the "probe" signal will be asserted when PMDX-126 connecter J12 pin 9 (labeled "15") is ground or +24V. Please see the PMDX-126 User's Manual for more information on "probe merged input" mode and input signal voltage range information.

6.4 External Test Switch Connector (J4)

This connector provides for an optional external "Test" switch. This switch duplicates the "test" switch function on the PMDX-126 board. The switch should be a single pole, single throw, normally-open, momentary contact switch. Connect the two switch terminals to the two terminals on J4 (it does not matter which terminal is which).

7.0 Mechanical Specifications

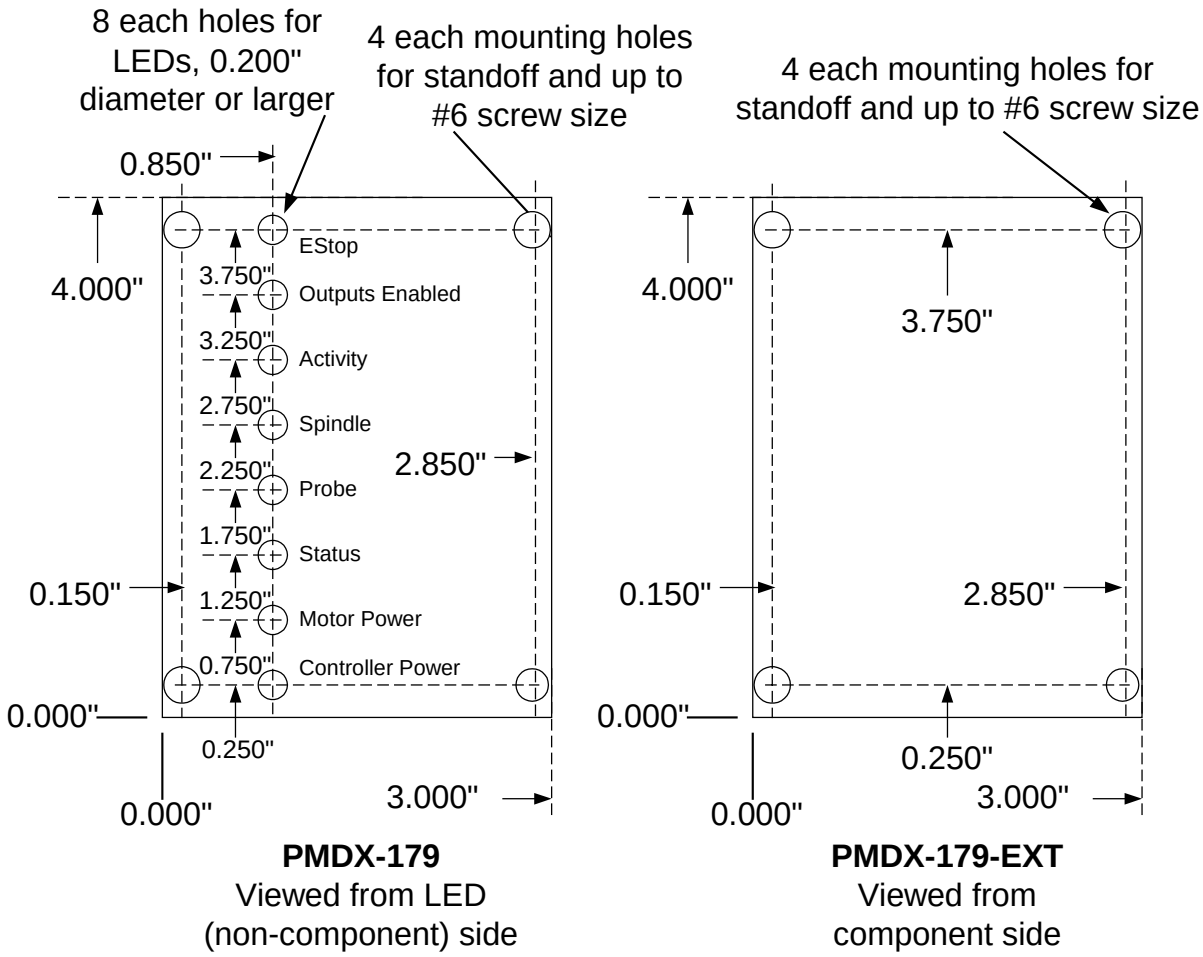

Figure 4 - PMDX-179 Dimensions and Mounting Plate Holes

The datum for all measurements is at (0,0) on the diagram, which corresponds to the lower left corner of the PMDX-179 circuit board.

Use 0.250" (1/4") tall standoffs between the panel and the PMDX-179. When mounted to a 0.062" thick panel, this allows the LEDs to protrude about 0.100" through the panel. The mounting holes in the PMDX-179 are designed to accommodate up to #6 screws.

The maximum component height above the PMDX-179 circuit board (on the side of the board facing ***away*** from the panel) is 0.700"

WARNING: The PMDX-179 should be protected from liquids, dirt, or chips (especially metal chips which can cause shorts) coming in contact with the board.

8.0 Electrical and Environmental Specifications

Board Power: ***Provided by PMDX-126 or other future PMDX product.***
Draws 50mA from PMDX-126 or other compatible controller board.

External Outputs:: On connector J3 (all except Motor Power LED):
Powered from external +5V to +48VDC supply
Each output must draw less than 100mA.

Note: Incandescent lamps are not recommended because of their high turn-on surge current.

Motor Power LED (connector J1):
Current limit: 20 mA

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

Appendix A – Warrant y

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.