AN003 – Using the PMDX-126's K2 Relay to Control Machine Power

This application note describes one method of having the PMDX-126 or PMDX-125 control the mains power to the motors such that power is removed from the motors under any error or emergency stop condition. ***Wherever "PMDX-126" is mentioned, it refers to both the PMDX-126 and the PMDX-125 unless otherwise stated.***

The PMDX-126 contains two relays, one of which (K2) can be used along with a mechanically latching emergency stop (E-Stop) switch to control an external contactor and disconnect power to the machine in the event of an emergency stop or system fault. Note that the PMDX-126's "MOV" terminal is connected to the "N/O" relay contact terminal. This helps prevent arcing on the PDMX-126's relay contacts when the E-Stop switch is pressed and extends the life of the relay.

> ***NOTE –*** This application note applies to ***mechanically latching emergency stop switches only***. These are switches that once pressed, stay "pressed" until the operator takes explicit steps to release the switch. Furthermore, the switch must have at least 2 electrically independent switch sections controlled by a single plunger.
> ***Do not use momentary contact E-Stop switches or single-section switches in these configurations!***

PMDX-126 Settings:

- DIP Switches "Config3", "Config2" and "Config1" must be set to a mode that requires a "charge pump" signal from the PC (i.e. "Run in Normal Mode with Charge Pump", "Run in Expanded I/O Mode" or "Run in Expanded Output Mode", see the ***PMDX-126 User's Manual*** for details).
- JP2 set to "multimode"
- DIP Switch "Config8" set to "open" (relay K2 controlled by "outputs enabled")

Mach3 Software Settings:

- Enable the "charge pump" signal in Mach on parallel port #1 pin 17

External Contactor/Relay Ratings:

The external contactor or relay must have contacts rated for the mains AC voltage and the current that your system will draw under its heaviest load. Also the contactor/relay coil voltage must match your AC mains voltage.

SAFETY WARNINGS:

The PMDX-126 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-126 is not guaranteed to be fail-safe. The system into which the PMDX-126 is installed should provide fail-safe protection and emergency stop capability.

The PMDX-126 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-126 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.

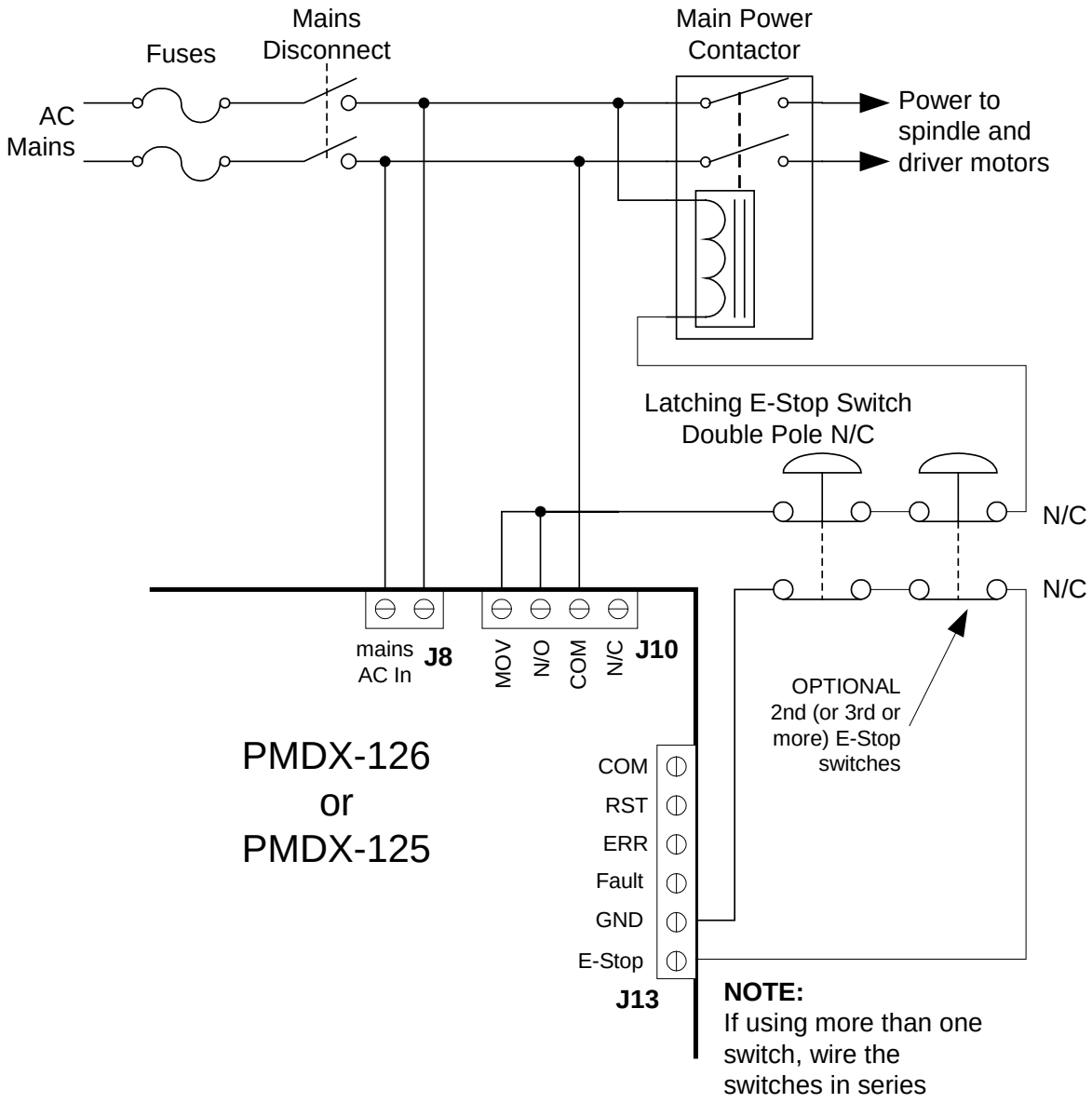

Figure 1 - Power Interrupt Circuit with Dual E-Stop Switch with two normally closed (N/C) set of contacts

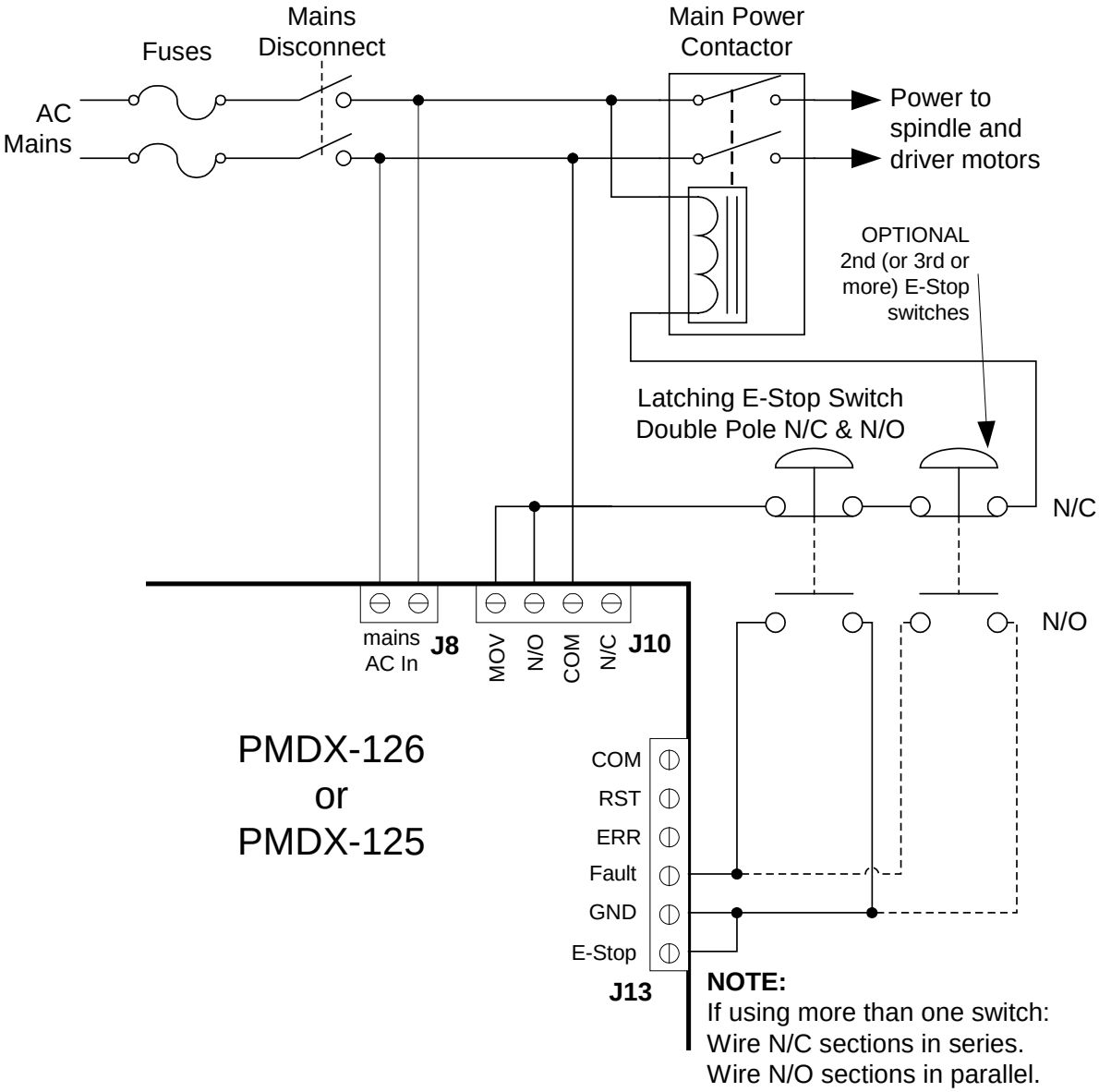

Figure 2 - Power Interrupt Circuit with Dual E-Stop Switch with one normally closed (N/C) and one normally open (N/O) set of contacts

Revision History

Date / Rev	*Description*
13 Aug 2012 Rev 03	• Changed app note numbering scheme (was AN125-1, this version is identical to AN125-1 version 03).