WinCNC Interface Board

Specification

| Power Input	DC Voltage	24V
	Max Current Draw	2A
Digital Inputs	Quantity	30
	Groups	2 x 15 inputs
	DC Voltage	24V
	Polarity	PNP, NPN. Configurable by jumper per group.
	Trigger Voltage	~9V
Digital Outputs	Quantity	12
	Groups	3 x 4 outputs
	Max Voltage	24VDC
	Max Current	1A
Relay Outputs	Quantity	8
	Max Voltage	250VAC, 220VDC
	Max Current	10A
	Relay Type	Coil SPDT
Step/Direction Outputs (motion)	Quantity	6
	Output Voltage	5VDC
	Rated Current	20mA, sink or source
	Signal Type	Differential or single ended
Analog Outputs (spindle RPM)	Quantity	1
	Max Voltage	5VDC or 10VDC externally supplied
Emergency Stop	Type	Normally closed dry contact

Introduction

This document will outline installing an Interface Board on your CNC machine controlled by WinCNC.

INPUTS

MOTION

OUTPUTS

Microsystems World CNC
WinCNC I/0 Board v1.2a
Made in the U.S.A.
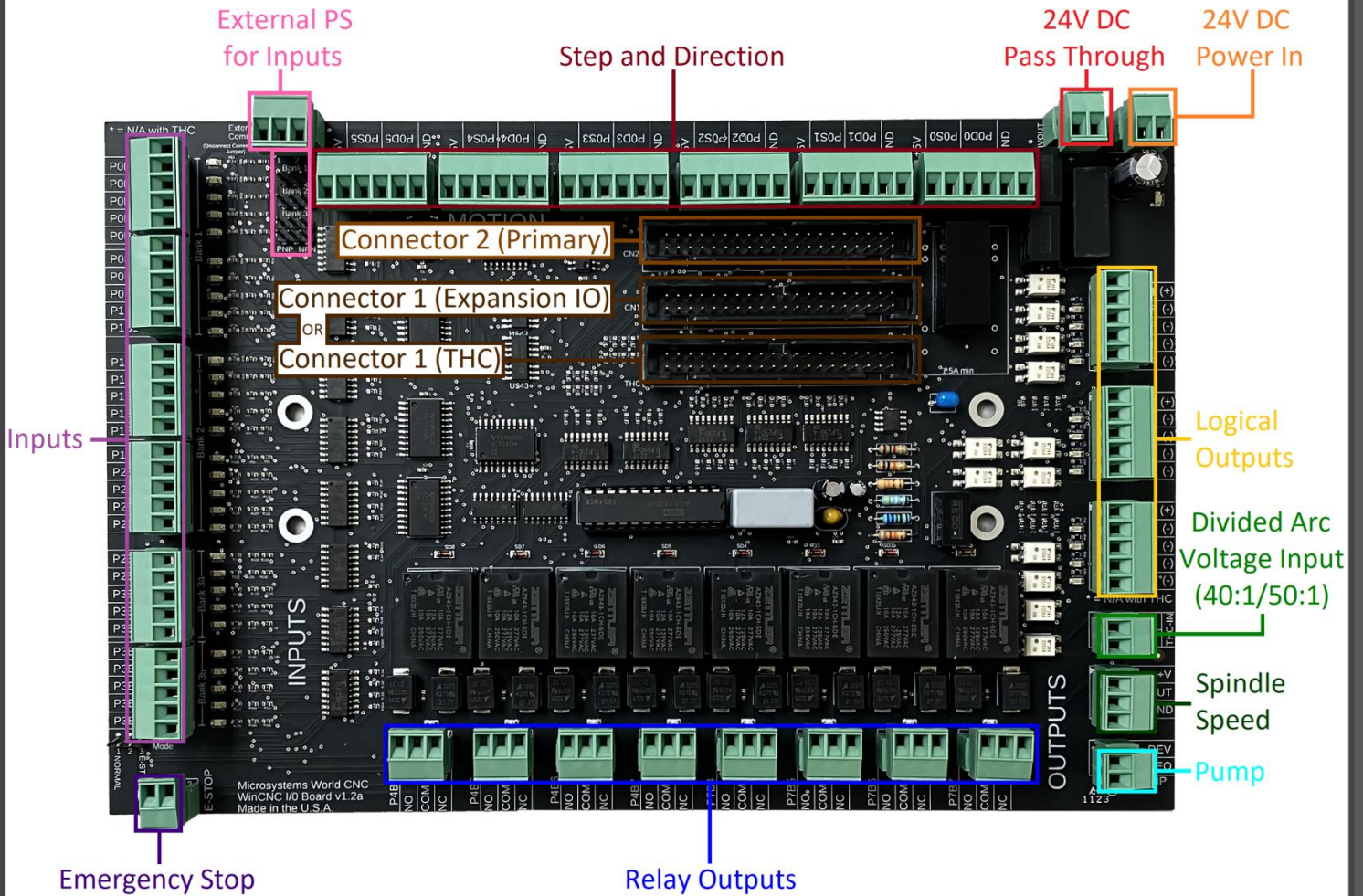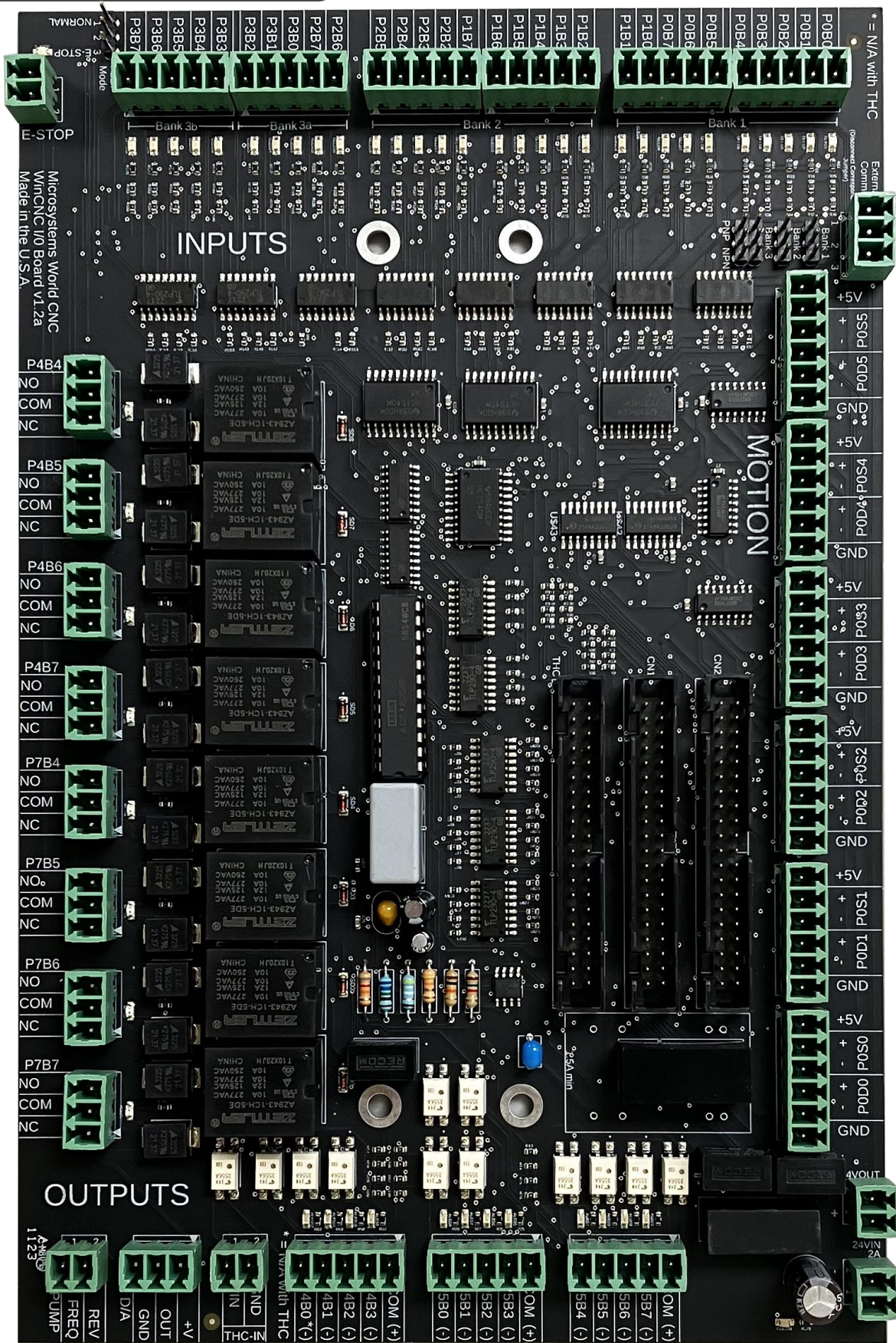
Emergency Stop Function

A circuit must be completed between the two E-Stop terminals. This can be accomplished with a normally closed switch or by simply shorting the terminals if you wish to bypass the E-Stop. When the emergency stop circuit is open, the outputs will go into the open state and the inputs will go low. Input P3B7 features a 3-position header where it can be configured for normal operation using pins 1+2 or E-stop signal using pins 2+3.

Power and PC Connection

The board can be powered using 24V DC and interfaces with the PC using two 40 pin to DB37 M ribbon cables. While only one header for the primary CN2 connection is present, there are two headers available for CN1 of which one can be used. The 40-pin header labeled "CN1" would be used for all applications except torch-height controlled plasma, where the header labeled "THC" would be required in this case. It is important to note that when using ribbon cables with the Interface Board the red wire on the cable (Pin 1) must go to pin 1 on the interface board. When looking at the board, pin 1 of the 40 pin header will be on the right side of the connector if you are looking at the board so that the letters "CN1", "CN2", and "THC" are legible.

External Power Supply for Inputs

One terminal is available for input banks 1, 2 and 3 respectively, where the positive or 0 volt side of an external 24V DC power supply can be connected. **Important: remove the jumper for the corresponding input bank when an external supply is used.**

Input Wiring

Below is an example of wiring for multiple limit switches. There are two different ways to connect inputs to the board and if you are using transistor style switches you will need to use the correct method for PNP or NPN depending on your switch type. Inputs are broken up into three grounds of 10 and the bottom bank is further broken into two groups of five, all of which are configured for PNP or NPN through jumper setting. Pins 1+2 set the group to PNP and pins 2+3 set for NPN as labeled on each header. Either method can be used with normal contact switches.
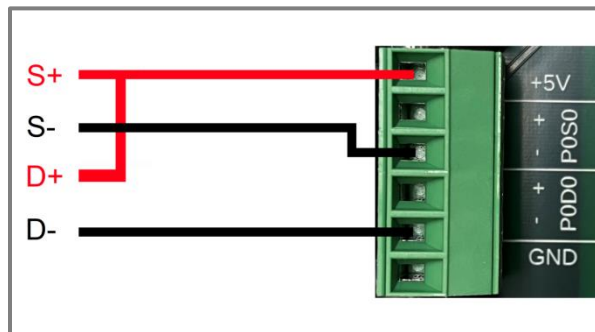

NPN

PNP
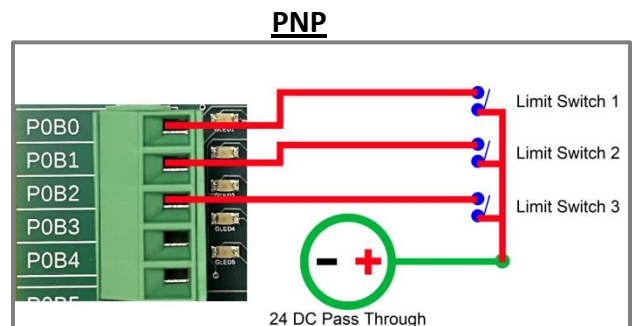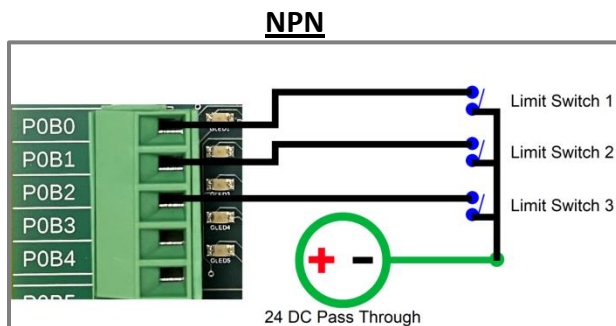
Step and Direction Wiring

Wiring examples for the step and direction portion of the board can be found here. As with the inputs, there are two different methods of connecting a servo or stepper drive to the board.
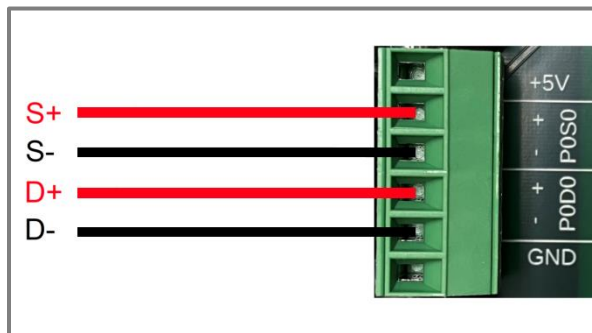
Sink
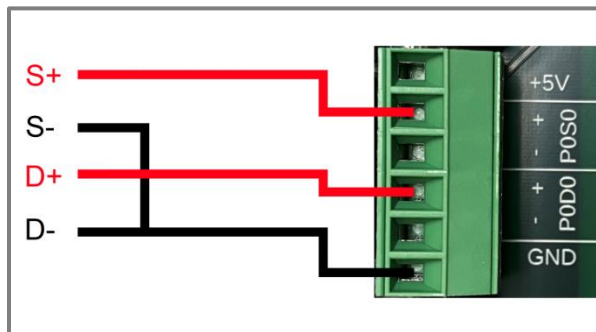
### Source

Differential

Logical Outputs

The twelve logical outputs on the right side of the Interface Board each have a positive common per bank and negative terminal for each output. A voltage input on the positive terminal will be output on the negative terminal when the corresponding output in WinCNC is turned on. Maximum rating for the circuit is 24VDC and 50mA.

Relay Outputs

The outputs on each board can be wired to turn on your spindle, dust collector, or any piece of equipment you would like to be able to control through the software. Your input power up to 240VAC and 220VDC goes into the COM terminal and depending on whether you want the equipment to be on while the control board is powered off (NC) or off while the control board is off (NO) you place another wire going from the corresponding terminal to the voltage input on your equipment.

NO

NC
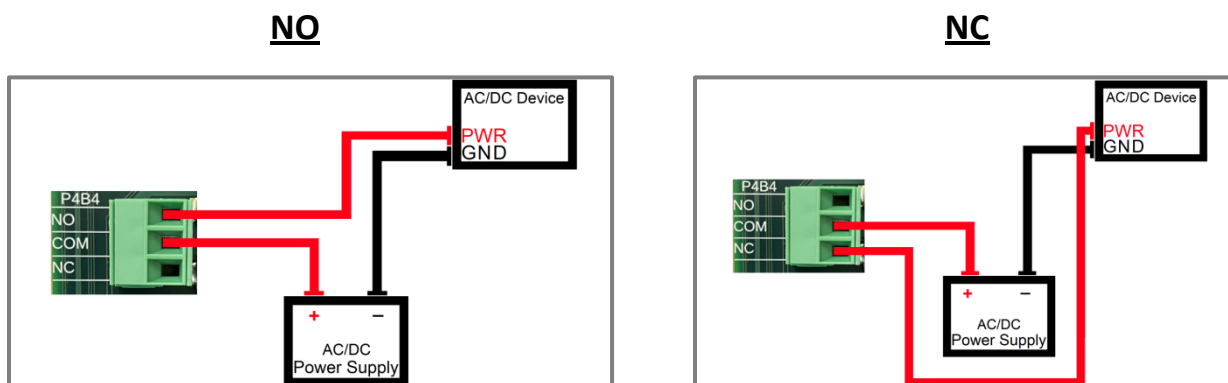
Spindle Speed

In conjunction with a VFD (Variable Frequency Drive), the Interface Board is capable of Spindle Speed Control, formerly known as Digital to Analog Speed Control. +10v, ACM (Analog Common/Ground), and AVI (Analog Voltage Input) is wired into the board from the VFD as shown below. Terminology can vary between VFDs, however what is specified in this wiring example is common.
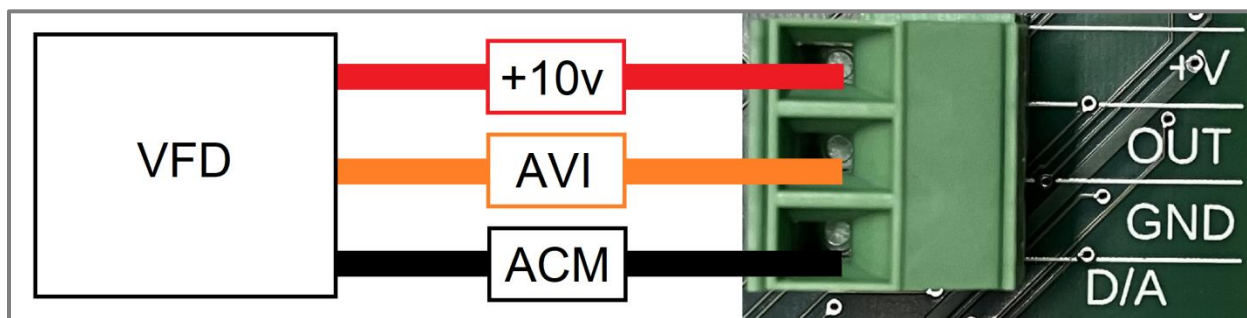
Interface Board Size Specifications
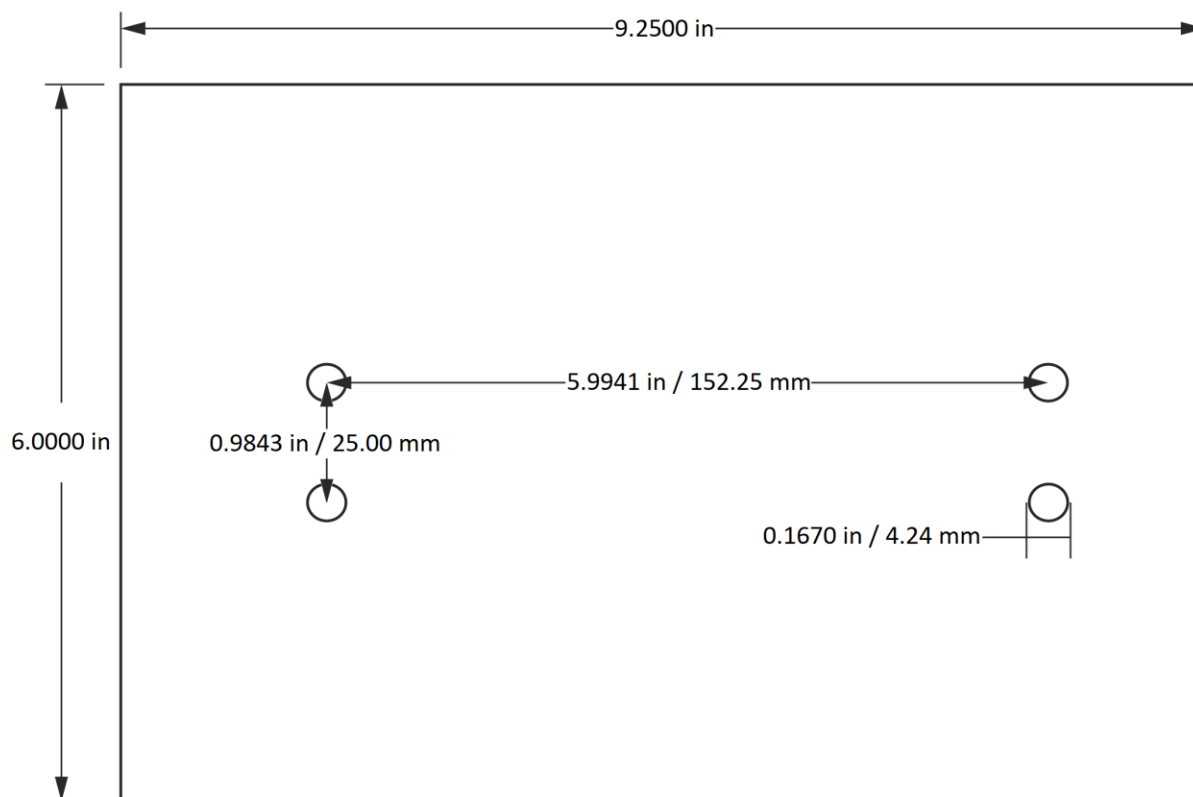
Board mounting holes are spaced to be used with DIN rail clips. Otherwise, standoffs can be mounted and used if preferred.