



VARIABLE SPEED CONTROL BOARD

Overview

Features

This card lets you control your spindle with step and direction signals, as if it was an axis motor. It converts the step signal into an analog (0-10VDC), which is what most Variable Frequency Drives (VFD) use for external control. This card also has a relay that lets you use the direction signal to direct the 24VDC signal from your VFD to the appropriate input signal of your VFD to drive CW or CCW.

A Variable Frequency Drive or Inverter works by modifying the frequency for AC motors. You can control most of these devices with an external analog signal (0-10VDC). That is, if there is 5VDC coming in through the control signal, the motor will run at 50% of full speed, if there was 10VDC, the motor will run at 100% of full speed. If there is no signal coming out, then the motor will stop.

This unit can also be used on many DC motor controllers by replacing the potentiometer that controls the speed.

- ***Inputs a frequency (step) and outputs an analog 0-10VDC.***
- ***Uses the direction signal to tell you VFD to go CW or CCW.***
- ***Optoisolated output signals.***

The analog and CW and CWW signals are optically isolated, so this board can be used with drives that make grounds common with the mains that drive the VFD or motor.

- ***All TTL 5VDC signals.***

Interface directly with parallel port interface products and other cnc4pc.com cards. 5VDC (TTL) signals are very common among automation devices.

- ***Screw-On connections for all terminals.***

You only have to screw-on the wires to make all your connections.

- ***Flexible design.***

It works with cnc4pc's products, directly through your parallel port, or through many other parallel port control products.

Installation

Requirements:

It requires a 12VDC power supply to operate.



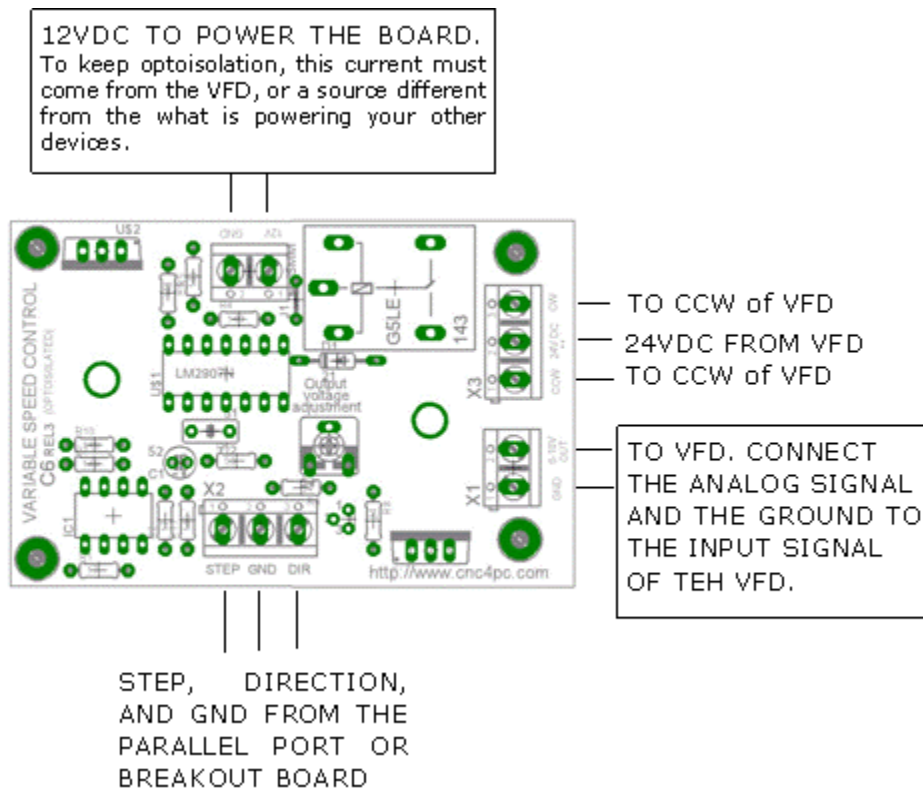
WARNING: To keep the output signals optoisolated these power supply must not have common grounds or current with other circuits you might be using.

You will require a voltmeter to fine tune your system..

Wiring:

Before connecting anything, please be sure to read your VFD's manual and make sure you understand all the safety issues.

Please note the wiring diagram bellow.



Configuring your Control Software:

It is strongly recommend you read your control software's manual. You need to configure your control software to control the spindle as if it was any other angular axis. This card requires a 25 KHz input signal to deliver 10VDC. So you need to configure the steps per minute and velocity, to deliver a total of 1,500,000 (25,000 hz x 60 seconds) pulses when going at max speed. I suggest setting using 1,000 for steps per unit and 1,500 for velocity.

For acceleration values adjust them to where you feel comfortable. Keep in mind the acceleration of the motor must also be set in your VFD.

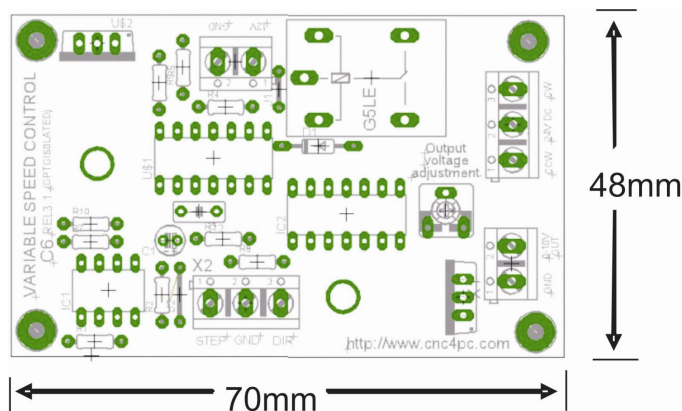
For configuring Machx follow these steps:

1. Go to Config / Ports&Pins / Motor Outputs. Enable the spindle and select the port and pins you wired for step and direction.
2. Go to Config / Ports&Pins / Spindle Setup. In the motor control box, check Use Spindle Motor Output and Step /Dir Motor. Under Pulley Ratios set the pulley ratios of your machine.
3. Go to Config / Motor Tuning / Spindle. On Steps per unit put 1,000, for velocity put 1,500. For Acceleration, choose the acceleration that you feel comfortable with. Start slow, increase acceleration as you test your system. Under Step Pulse length, use a number from 1 to 5. This number is directly proportional to the final voltage you will get in the analog output. Use this number and the fine tuning pot in the card, the normally hi or low status of your pin, and the pulse width.

Fine Tuning:

Make sure that when you reach the max speed in your software you get 10VDC out. This voltage can vary depending on many things, including the electrical properties of parallel port or breakout board you are using, the length of the step pulse your software is delivering, and the normal hi or low status of your step pin. Play with the fine tuning pot in the card, the normally hi or low status of your pin, and the pulse width.

Dimensions:



Disclaimer:

Use caution, CNC machines are dangerous machines. DUNCAN USA, LLC nor Arturo Duncan are not responsible for accidents caused by improper use of these devices.