

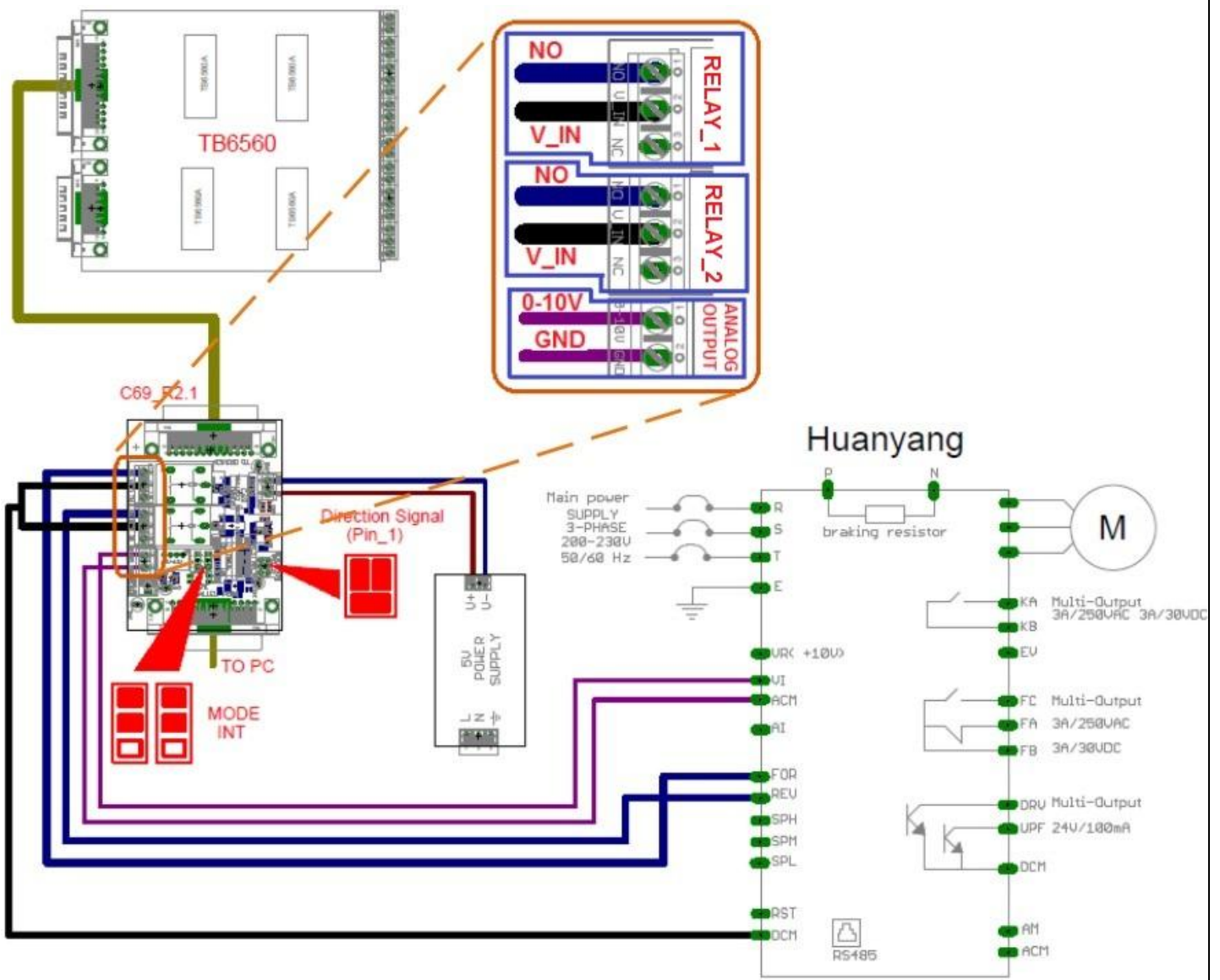
# CNC<sup>4</sup>PC

Integration Solutions for CNC Projects

## PRODUCT INTEGRATION INSTRUCTIONS

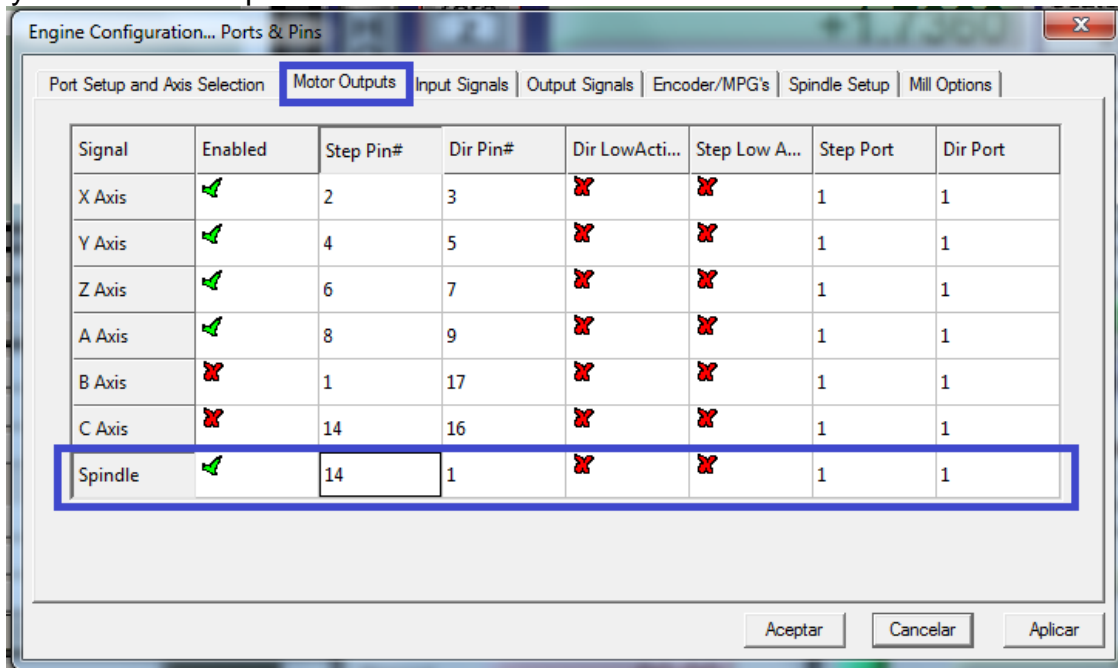
### Connection C69 with TB6560 AUGUST, 2014

Set the jumper on the C69 for TB6560 and VFD Huanyang



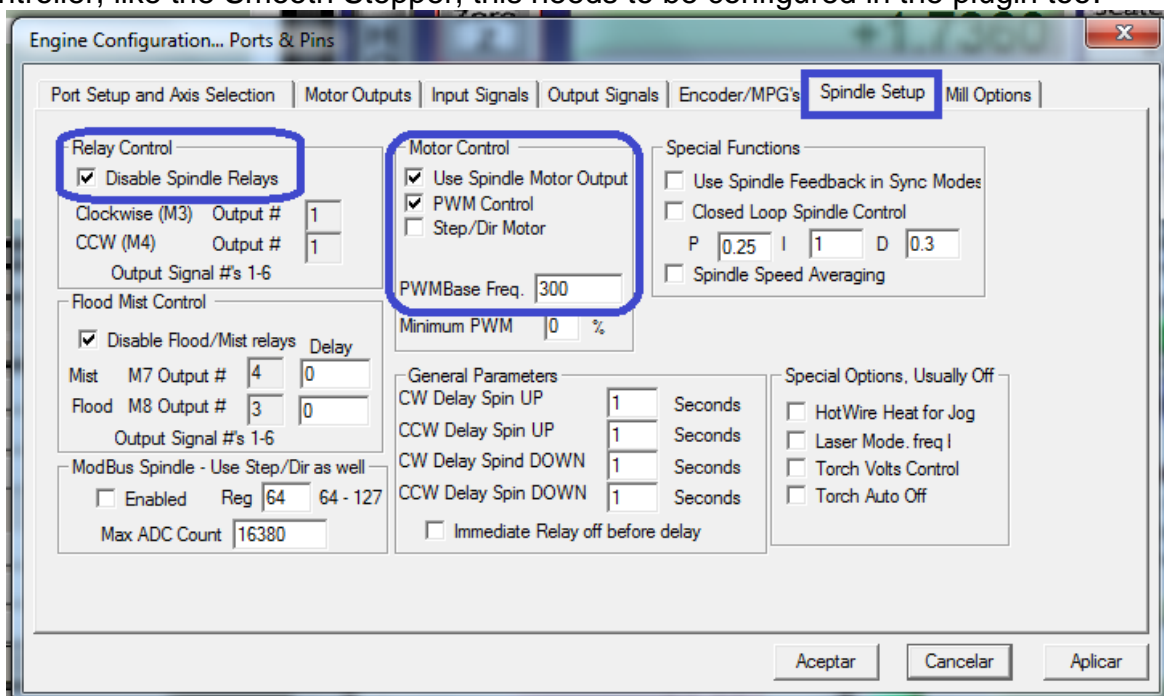
## Configuring the Control Software:

Go to Config / Ports&Pins / Motor Outputs. Enable the spindle and select the port and pins you wired for step and direction.



## Ports&Pins configuration screenshot

Go to Config / Ports&Pins / Spindle Setup. In the motor control box, check Use Spindle Motor Output and PWM Control with a frequency of 300Hz. If using an external motion controller, like the Smooth Stepper, this needs to be configured in the plugin too.



## If used the Smooth Stepper

Go to plugIn control / SmoothStepper v17fd config. Enable PWM and with frequency of 300Hz

**Dialog**

Controller Frequency: 1 kHz  
The Controller Frequency controls how many times per second the velocity is updated when outputting pulses.

Port 2 Pins 2 through 9 Direction: In

This setting has tradeoffs. At higher frequencies, the motion should be smoother because there are more velocity updates per second. But at higher frequencies the negative aspects include lower resolution (probably a minor point), a smaller data buffer, and more demands on USB bandwidth. At 250 Hz, up to 4 seconds of data can be queued up. Each doubling of frequency halves the buffer length, so at 500 Hz, 2 seconds can be buffered, 1 kHz, 1 second, etc.

**Max Step Frequency**  
Set the maximum step frequency to the value that is greater than the maximum step frequency for each axis. Setting this higher than it needs to be will limit resolution. For example, if the real max step rate is 500 kHz, and you set the Max Step Frequency to 1 MHz, then full scale will be 1 MHz, but the plugin will never send a velocity command to the SmoothStepper greater than 1/2 of full scale, thus losing one bit of resolution. The Setting for Spindle is not the same. Resolution is fixed, so it doesn't matter what you select. However, it affects the scaling in Motor Tuning, so you may choose a selection that makes Motor Tuning work better.

X-axis: 256 kHz  
Y-axis: 256 kHz  
Z-axis: 256 kHz  
A-axis: 256 kHz  
B-axis: 256 kHz  
C-axis: 256 kHz  
Spindle: 32 kHz

**Spindle**  
 Relay or None  PWM  Step and Dir  
Base Hz: 300 Pulse Width (us): 0.0  
Spindle Index Prescale: 1 Max of 4096. Set to 1 for no prescale (default)

**Miscellaneous**  
 De-Reference Axes in EStop  
 Don't Report Port and Pin Warnings  
1023 Number of Data Points Mach Should Pre-Calculate

**Output Mode**  
Step and Direction: X, Y, Z, A, B, C (all checked)  
Quadrature: (all unchecked)

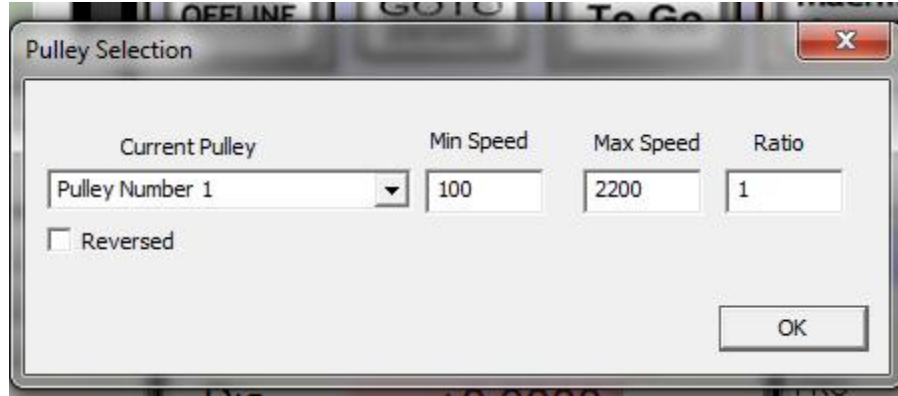
**Noise Filtering**  
Noise Filtering of inputs. An input must be stable for the specified amount of time in microseconds before it will be considered valid. Values will be assigned to groups of similar signals. The specified values will be rounded to the nearest multiple of about 1.43 microseconds. To disable filtering for a given groups of inputs, use a value of 0.0 microseconds.  
Limits: 0.00  
Home: 0.00  
Probe: 0.00  
EStop: 0.00  
Jog: 0.00  
Encoders/MPGs: 0.00 (includes A, B, Index, and timing)  
Miscellaneous: 0.00 (Miscellaneous covers all other inputs)

**Watchdog**  
If the PlugIn fails to communicate with the device within the amount of time listed below, an EStop will be triggered in the device. The time is in seconds and is rounded to the nearest tenth of a second. Max value is 3.1 seconds.  
2.0

**M11Px/M10Px Commands**  
 M11Px/M10Px Gates Spindle Output Output #: 0  
Dwell time associated with M11/M10 Commands  
M11: Dwell selected in this config  Delay: 0 milliseconds  
Dwell selected Via User DRO  User DRO #: 0  
M10: Dwell selected in this config  Delay: 0 milliseconds  
Dwell selected Via User DRO  User DRO #: 0

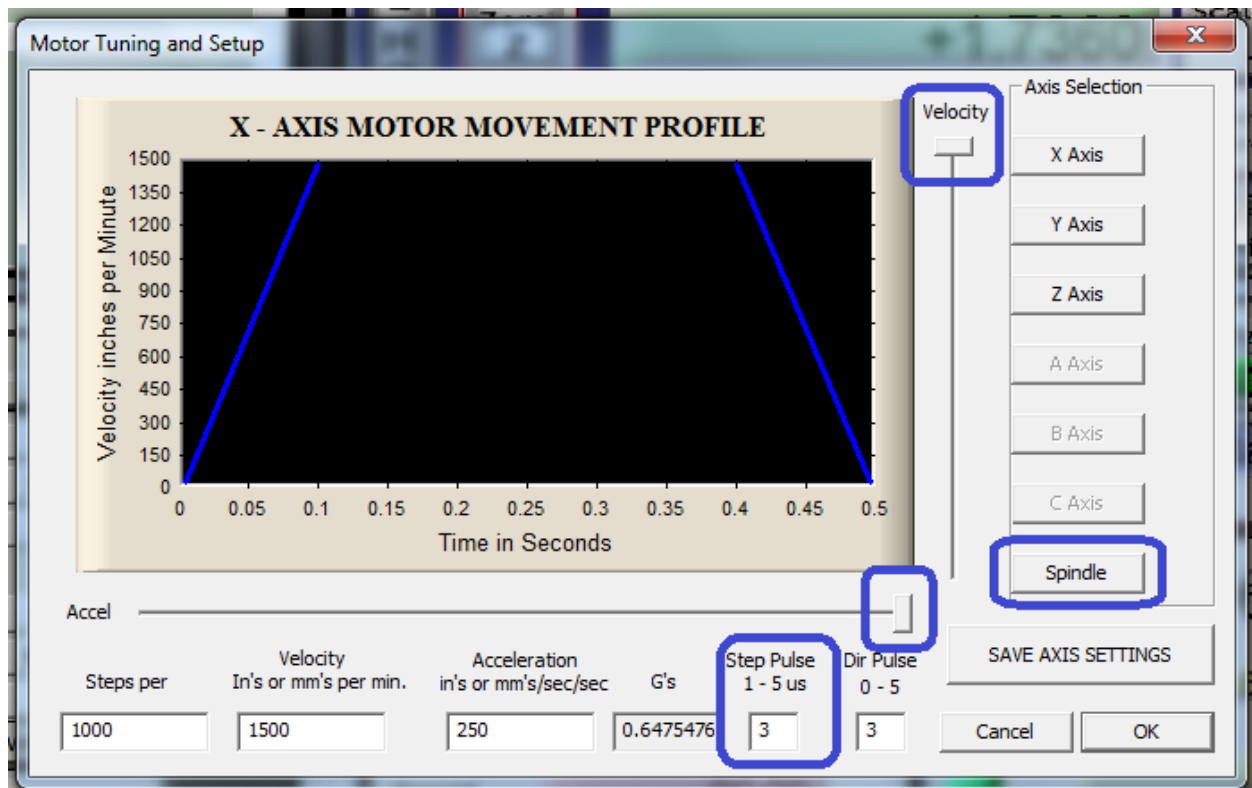
OK  
Cancel

Under Pulley Ratios set the pulley ratios of the machine.



### Spindle Motor Tuning Setup screenshot

Go to Config / Motor Tuning / Spindle. Set the velocity and acceleration to the max.



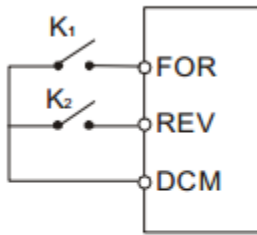
## Configure the VFD for external control

Refer to the manual of VFD Huanyang:

<http://www.automationtechnologiesinc.com/wp-content/uploads/downloads/2012/02/VFD15-22.pdf>

## Spindle start, stop and rotation FOR/REV, see manual in page 26

2. RUN, DCM, F/R can be used for Start, Stop and switching of FOR/REV:



① Select FOR and REV

② Parameter setting:

PD001=1 for external control

PD044=01 for RUN function

PD045=05 for switching of F/R

When K2 is opened it rotates forward, while K2 is closed it rotates reverse.

### 3. Description of Ramp Time 1 and 2:

- 1) This function is only valid when PD080 is set to 0, 1 and 2. Under the disturbance and internal control multi-speed it is invalid.
- 2) Any two multi-inputs can be combined for 4 kinds of ramp time for selection.

## Configuration for regulate the speed, see manual in page 15

PD002 Source of Operating Frequency

Set Range : 0—2

Unit : 1

Factory Setting : 0

0 : Set by the operator. Operating frequency is given via the digital operator.

1 : Set by external terminals. Operating frequency is controlled by analog signals input via external terminals. The signal type is determined by PD070. For the related parameters refer to PD070-PD076.

2 : Set by communication ports. Operating frequency is given via the serial communication.

## Disclaimer:

Use caution. CNC machines can be dangerous machines. Neither DUNCAN USA, LLC nor Arturo Duncan are liable for any accidents resulting from the improper use of these devices. This product is not a fail-safe device and it should not be used in life support systems or in other devices where its failure or possible erratic operation could cause property damage, bodily injury or loss of life.