The black magic of G-Codes spindle

Controlling the spindle with a controller is one of the most fundamental and convenient differences that separate our product from the competition. Not only does it allow you to select the RPM of your spindle but also the direction and on / off. This gives you the convenience of allowing the machine to finish its cycle and turning itself completely off.

Whenever you are operating in the area of the spindle is appropriate to lock the spindle to insure that no spindle operation is possible. That is why we have incorporated a spindle lock into every spindle controlled machine. You can unlock and lock the spindle from the touchpad on the face of the machine. The only buttons used are the stop and start buttons. Before beginning any operations make sure that your controller is on, the machine is then switched on, and the controller reset. If you look at your display on the face of the mill you'll notice a reading of "0000 forward stop" is illuminated on the LCD. This represents a locked spindle. To unlock the spindle simply press the "start" button on the face of the mill. You'll notice that the spindle does not turn. In the LCD display however, you will notice that the display now reads "0080 forward". This represents the spindle is unlocked and ready for G-Codes control. You should not have your hands on or around the spindle while the spindle is unlocked. It is always possible for a PC, with as complex as it is, to produce a rogue pulse that may turn on your spindle. Making it a very frightening and possibly unpleasant day for yourself. At any time you're ready for a tool change, it is suggested that you press the stop button on the face of the mill after the spindle has stopped motion to re-lock the spindle.

Pulley speed set up in your Mach 3 controller

The daughter board that controls your spindle motor is controlled via pulse width modulation or PWM. Since there is no active indexed feedback into the controller the speed is an educated guess. At the factory we tune the spindle to plus or minus 100 of the desired RPM. So, it is possible to input 1000 RPM and display 1100. Although this makes very little difference in the machining capability of the machine it is somewhat confusing. To ensure your Mach 3 controller knows the range of speed so I can divide up the pulse width modulation correctly you need to tell at the range of speeds. Under the config tab of your controller you will find pulleys. If you are running a small pulley your range of speed is from 80 RPM to 1750. If this were the case, in Pulley 1 enter for a minimum 80 and a maximum 1750. If you're running a larger gear your minimum speed will be 200 and your maximum speed 3500. If you are switching between smaller and larger pulleys you may want to set up pulley 1 for low speed and pulley 2 for high speed. We are working on an index feedback addition to the machines that will enable full rigid tapping capability once the Mach 3 controller supports it. Look for this in the near future.