

If a servo motor runs away at full speed or flicks and indicates a fault on its driver then its armature (or encoder) connections need reversing (see your servo electronics documentation for more details). If you have any troubles here then you will be pleased if you followed the advice to buy current and properly supported products - buy right, buy once!

Most drives will work well with a 1 microsecond minimum pulse width. If you have problems with the test moves (e.g. motor seems too noisy) first check that your step pulses are not inverted (by *Low active* being set incorrectly for Step on the Output Pins tab of Ports and Pins) then you might try increasing the pulse width to, say, 5 microseconds. The Step and Direction interface is very simple but, because it "sort of works" when configured badly, can be difficult to fault-find without being very systematic and/or looking at the pulses with an oscilloscope.

5.5.2.2 Motor maximum speed calculations

If you feel that you want to calculate the maximum motor speed then read this section.

There are many things which define the maximum speed of an axis:

- ◆ Maximum allowed speed of motor (perhaps 4000 rpm for servo or 1000 rpm for stepper)
- ◆ Maximum allowed speed of the ballscrew (depends on length, diameter, how its ends are supported)
- ◆ Maximum speed of belt drive or reduction gearbox
- ◆ Maximum speed which drive electronics will support without signalling a fault
- ◆ Maximum speed to maintain lubrication of machine slides

The first two in this list are most likely to affect you. You will need to refer to the manufacturers' specifications, calculate the permitted speeds of screw and motor and relate these to units per second of axis movement. Set this maximum value in the *Velocity* box of Motor Tuning for the axis involved.

The Mach1/Mach2 Yahoo! online forum is a useful place to get advice from other Mach3 users, world-wide, on this sort of topic.

5.5.2.3 Automatic setting of Steps per Unit

You might not be able to measure the gearing of your axis drive or know the exact pitch of a screw. Provided you can accurately measure the distance moved by an axis, perhaps using a dial test indicator and gage blocks, then you can get Mach3 to calculate the steps per unit that should be configured.

Figure 5.12 shows the button on the settings screen to initiate this process. You will be prompted for the axis that you wish to calibrate.

Then you must enter a nominal move distance. Mach3 will make this move. Be ready to press the EStop button if it seems to be going to crash because your existing settings are too far out.

Finally after the move you will be prompted to measure and enter the exact distance that was moved. This will be used to calculate the actual Steps per Unit of your machine axis.

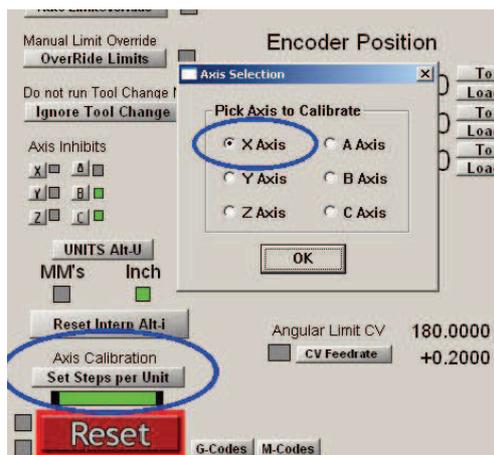


Figure 5.12 – Automatic steps per unit