Tuning a 2 Motor Axis System

The auto-tuner function has a screen that allows the user to limit the stroke distance during the auto-tuning process for axes with constrained motion. As you go through the auto-tuning process, you will be given an opportunity to limit the stroke before the actual tuning begins.

Dual motor axes are a little tricky to auto-tune, but one way that usually works pretty well (assuming the X and Y axes have the same mechanical transmission design) is to tune the Y axis (the single motor horizontal axis) temporarily loaded up with half the weight that the X axis handles, and then to use that tuning configuration file (slightly modified as described below) as the X axis configuration file:

1. To reiterate, we're assuming that the X and Y axes have the same mechanical design (e.g. both axes use a rack and pinion with the same pinion diameter, tooth pitch, etc.). If the dual motor axis is a different mechanical design than the single motor horizontal axis (e.g. the dual motor axis is rack and pinion and the single motor axis is a ballscrew), you should contact Teknic for support at support@teknic.com. The vertical Z-axis should not be used in this procedure.

2. Load 1/2 the total X gantry weight onto the single Y motor axis and then run the auto-tuner.

3. After auto-tuning the one Y axis motor with the appropriate weight, save the file to your computer as the X axis motor file.

4. Connect MSP to each of the X motors and load the X motor file into each motor. If the X motor shafts are facing each other, one motor will be moving clockwise and one motor will be moving counter-clockwise when the gantry moves down the table. You can either compensate for this by programming your controller or you can select the "Reverse Direction" checkbox on the MSP main page for the Step and Direction mode. If you select the "Reverse Direction" checkbox for one motor, you will send the same exact command to both motors when making a move.

5. If the two X axis motor files are different (i.e., if you checked the Reverse Direction box for one of the motors), save the two X motor files with different names (e.g. Xa_SDSK-3421S_rev1 and Xb_SDSK-3421S_rev1)

6. Run the machine.

7. If the X axis does not seem to have optimal tuning, try to improve the tuning by moving the "Fine Tuning" slider to the left to see if your results improve. You will need to do this with both X motor files before evaluating the effectiveness of this step. If you make any changes to either file, re-save the new files (overwrite the old files or create new names) so you have the files saved in a safe location for the future.

8. Always use the same RAS setting for all motors for CNC applications.

For more information, please email us at support@teknic.com.