TB260 (Rev1) - CNC11 Torque Mode Tuning

Purpose: This document will describe how to set the PID settings for your DC Brushed motors and tune them using the scope display on the PID Configration screen.

First Step (VERY IMPORTANT!):

   Before powering up your CNC11 control and tuning your servo motors you must first set the drive current on your Allin1DC. The drive current is configured for each axis by dip switches located behind H? (input bank) on the Allin1DC. To the right of the "Current Rating" dip switches is a table which explains the positions of the switches for 6, 9, 12, and 15A. If you have Centroid supplied motors see the table below for the current rating of the motor you have and set the dip switches for each axes accordingly.

CNC11 Torque Mode Default PID Settings for Centroid DC Motors

DC Motor/Drive current Combination	Kp	Ki	Kd	Limit
Redcom 17" lb. 9A	0.5	0.004	1	32000
Glentek 29" lb. 12A	1.0	0.004	3	32000
Glentek 40" lb. 15A	1.0	0.004	3	32000

Note: The Limit is set to 32000 for 8000 count encoders. If you are using higher resolution encoders the general rule for calculating the Limit is (Encoder counts x 4). ex. 10000 line count encoder would have 40000 counts, multiply 40000 x 4 to get a Limit of 160000.

CNC11 Torque Mode Adjustment

Goal: Get the error to +/- 10 -15 counts at the beginning and end of the move and +/- 2-4 counts during the move.

Procedure

1.) Position all axes in the middle of their travel, and set part zero.**F1-Setup, F1-Part, F10-Set** (sets X-axis)**, F1-Next Axis, F10-Set** (sets Y-axis)**, F1-Next Axis,** and **F10-Set** (sets Z-axis).

2.) Go to the PID Configuration screen to do this press**F1-Setup**, **F3-Config**, PW-**137**, **F4-PID**, and then **F1-PID Config**.

3.) Press**F1-Prog**. to edit the program that will be used during tuning. Base program move the axis you are tuning 1 inch at 100ipm, save program.

4.) Press**F2-Start Prog** to start tuning program, then adjust Kp up. To adjust Kp highlight the Kp value and use the**Pg UP/Pg Dn** keys to adjust the value up and down.

5.) When move starts to oscillate move Kd up, then continue to adjust Kp.

6.) Once Kp and Kd are set, press**F9-Save** to save the tuned Kp and Kd settings. Now set Kv1 to 10 and Ka to 20.

7.) Re-start the program**F2- Start Prog**. and adjust Ka to reduce the error at the start and end of the move.

Document History

Rev1 Created on *2012-04-24* by *#240*