CNCdrive.com motion controller configurator software user's guide

When you run the program, on the main screen there are 5 selectable TAB pages, selecting one-by-on, you will get to different config screens..

1.) Port setup

At software startup, you will see the port setup screen. This is the first you have to configure.
Select the COM-port of your device from the dropdown menu.
All devices appears as a standalone COM-port. Select the one you wish to configure.

2.) Automatic PID configuration

You can configure your servo controller device with our software automaticly. Just click the start button and your controller is configured in some minutes.
You can stop the procedure with pushing the 'STOP' button.
After the software finished the configuration, it will ask if you want to save settings to EEPROM memory or not. If yes, settings will be stored in the servo-controller's non-volatile memory. If you choose no, the setting will live until a device restart.

Please note, that the automatic tuning procedure will cause resonance in the system!

3.) Manual PID tuning

There's an option to tune all parameters manually.
You can change these parameters:

-Ar (Proportional term)
-Ad (Differential term)
-Td (Differential time)
-Li (Integral limit)
-Ti (Integration term)
-Encoder resolution: 2X or 4X logic.

4.) Error-viewer

You are able to monitor your controller's servo-error signal in real time.
This signal is: required_position - actual_position.
On the screen there are 500 samples one time, it's about a 0.5 seconds interval in time.
The screen is updated in nearly realtime.
At the bottom of the screen you can see the signed maximum errors in numerical format and in visual format as a processbar, aswell .

PID tuning, how to tune the controller manually

There is no common procedure to tune a servo controller, but we wrote down some tips to help you tune your PID controller.

1.) Ar, Proportional term
The propotional term provides an output signal proportional to the input signal.
Xout=Ar*Xin.
You should start tuning this term first..
Set all other terms to 0 and all times to 1.
Let's increse Ar from a low value, until you get instabil response. The motor then start to twist arount the trip point. This is the critical gain of your system.
Now let's set the term to about 60% of the critical value.

When increasing this parameter, the system's stability will decrease and response time will increase!

2.) Ti, Integration time.
Set Li(integration limit) to the maximum, 255.
From a low value start increase Ti, until you get an unstable response.
Let's lower the value about 60%

When increasing this parameter, the system's stability will decrease and response time will increase!

3.) Li- integral limit
This term affects the slow motion response and elliminate error when motor stops after movement. Increasing the parameter will decrease stability. If the parameter is to low you will get a setpoint error after motor stops and following error will occur aswell.
If your motor is good (servo-like) enough, you can set this parameter to maximum 255.

When increasing this parameter, the system's stability will decrease, setting the parameter too low will cause stall and/or following error!

4.) Ad differential term and Td differential time.

Increasing this term the system's response will be better, reaction will be faster.
If you increase this parameter, you will get better results ad high accelerations and deccelerations. Tune this parameter to fit your needs.

Increasing this parameter will cause better response at high accelerations.