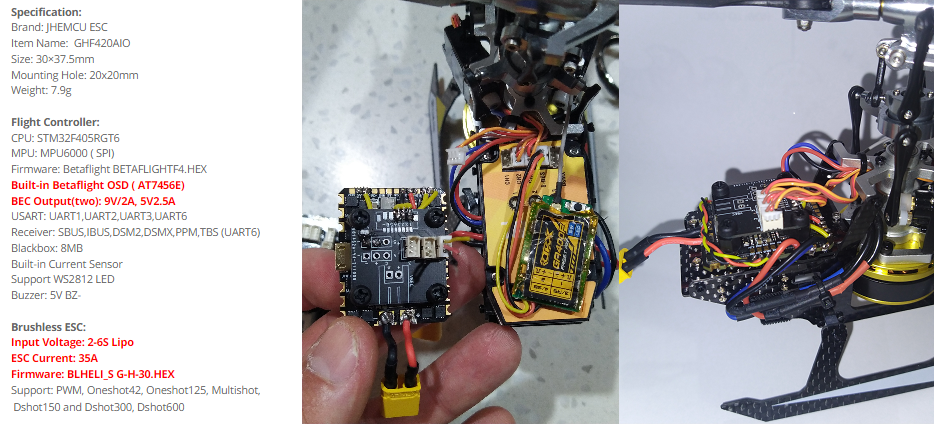
Set Up process for Rotorflight running on a GHF420AIO 35A Flight controller in an E180 helicopter. This flight controller is a 5A 4 in 1 ESC for 1-2s.

Rotorflight is a betaflight fork following on from the Heliflight to be specifically for single rotor helicopters.

The official project is located on Github: <https://github.com/rotorflight/rotorflight/wiki>

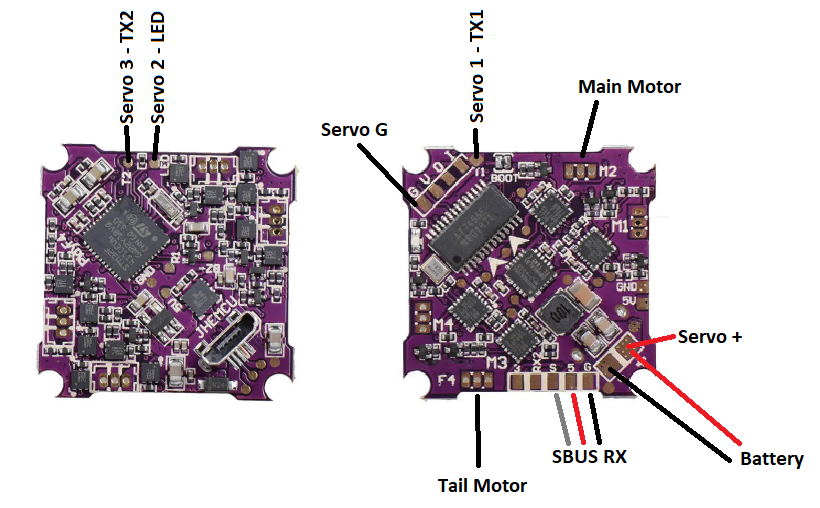
The official RC groups thread is located: <https://www.rcgroups.com/forums/showthread.php?4000345-Rotorflight-Flight-Control-%28FBL%29-Software-Official-discussion>

There is also a Discord chat group for advice and assistance. \*\*\*todo



Motor and Servo Wiring.

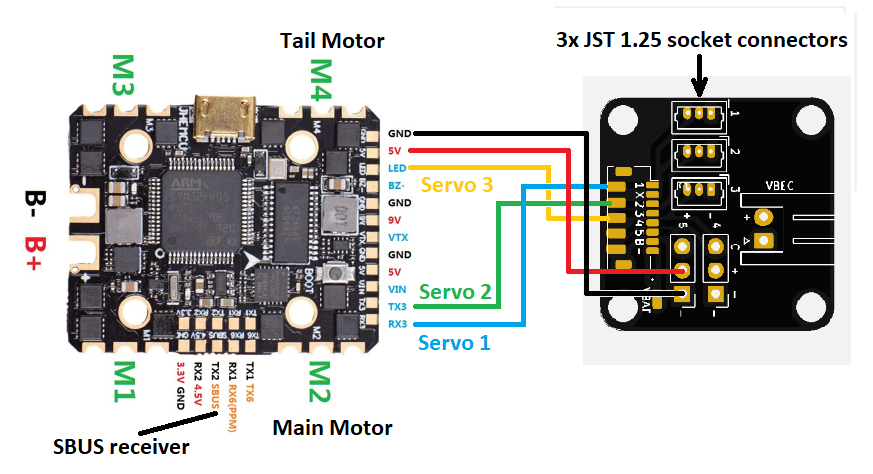
I have used one of the top hat boards designed by Mopatop.



Servos and wiring:

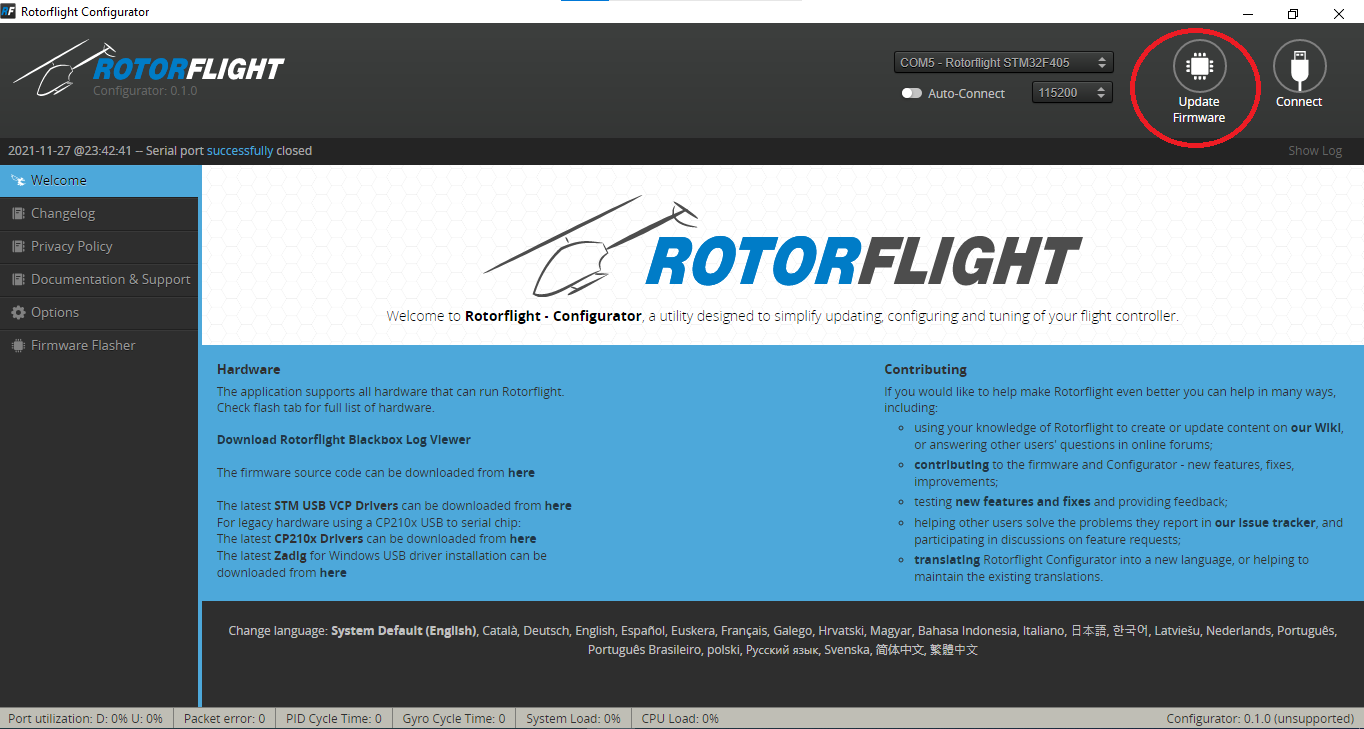
You can either wire your own servo loom or get one of Rob Haswell’s servo adapter boards.

1. Download 5 servo top hat board from <https://github.com/robhaswell/heli-servo-board-20mm/blob/master/gerber-5-servos-jst.zip>
2. Read the instructions on how to order the PCB at the bottom of the page. The PCB’s are very easy to order, extremely cheap (about AU$10 for 10 boards delivered) and arrive very quickly. <https://github.com/robhaswell/heli-servo-board-20mm>.
3. Solder 3x JST 1.25 sockets to the board

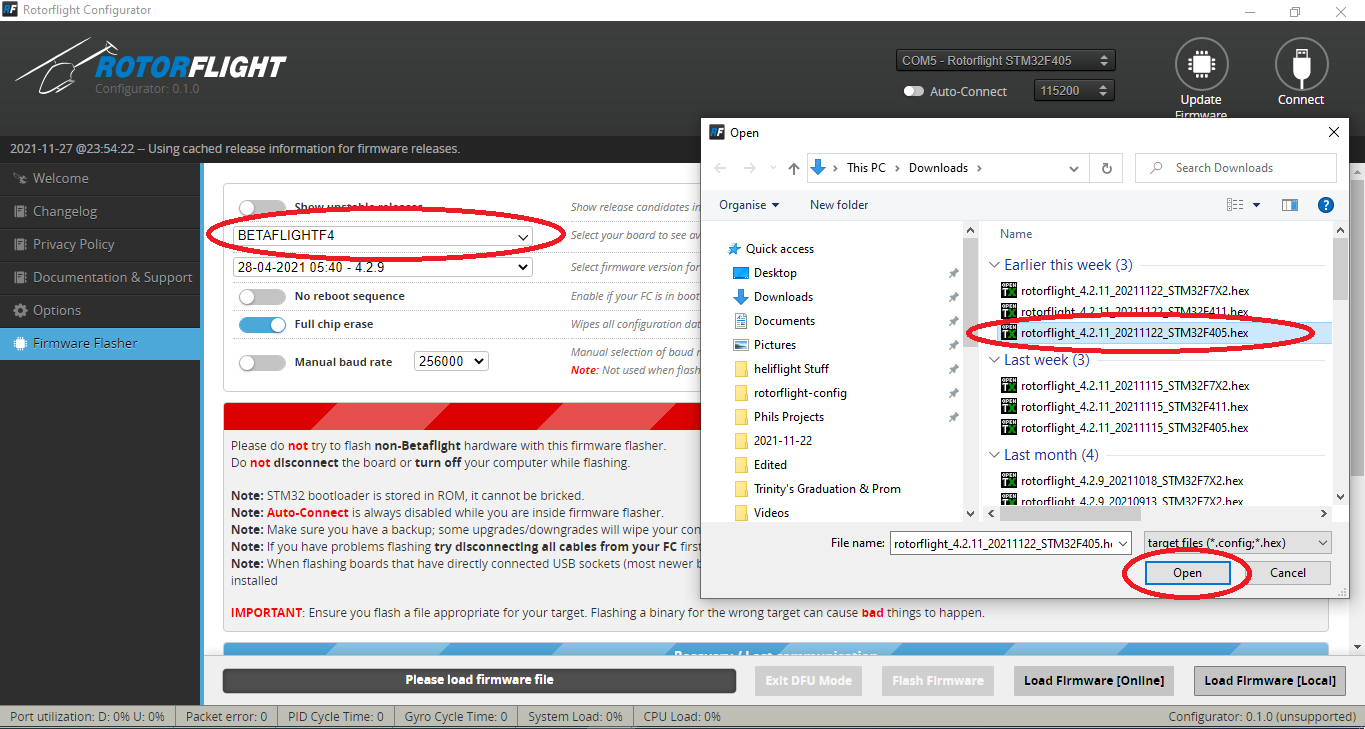


Configuration:

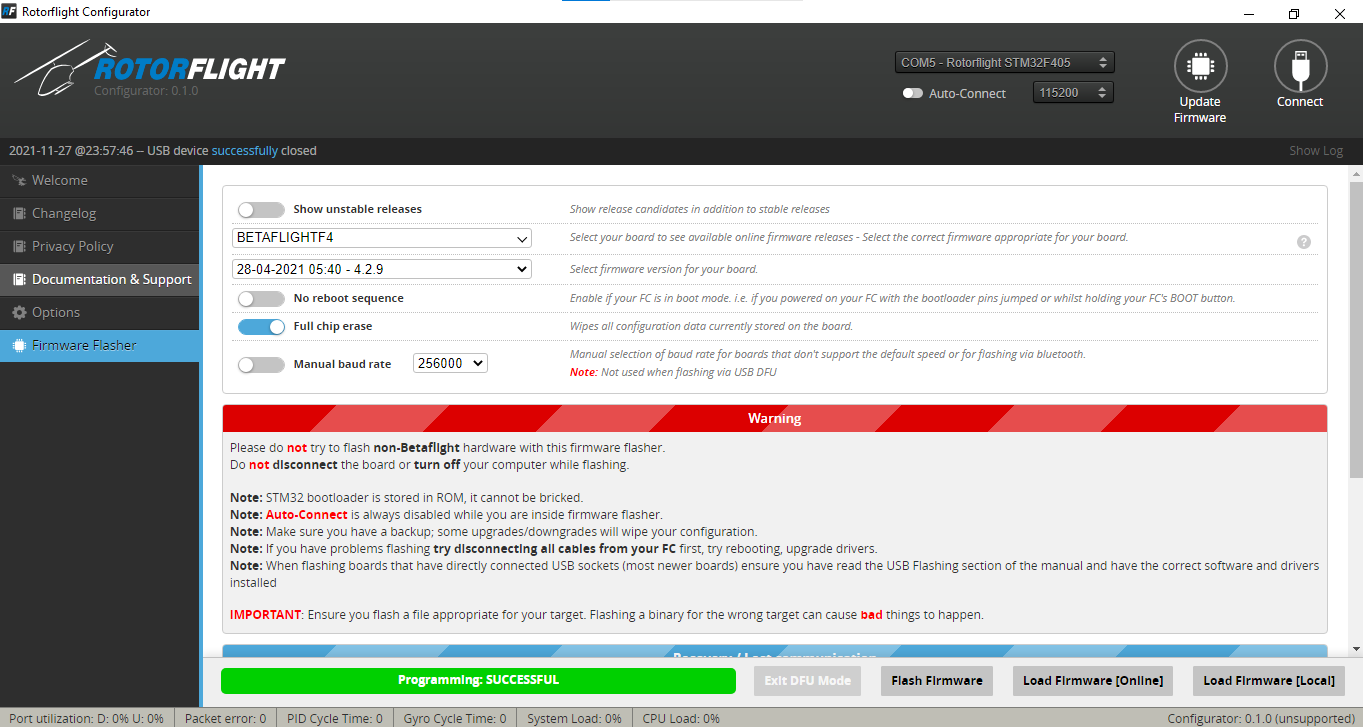
1. Download the latest Rotorflight-configurator snapshot from Github.
2. Download the latest rotorflight-firmware snapshot from Github.
3. Click on [Update Firmware] to enter the firmware flashing page.



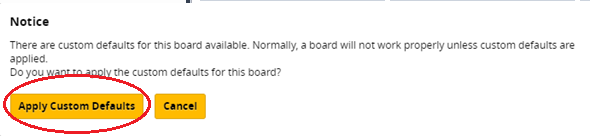
1. Load Firmware [LOCAL] and select the Hex file from the Zip files. From the CPU specifications in picture (??) we can see the processor is an STM32F405. Select this HEX file from your downloaded Rotorflight targets. Set the “Full Chip Erase”
2. Also as shown in the board specifications select “release and release candidate” to be BetaflightF4.
3. Click [Flash Firmware]



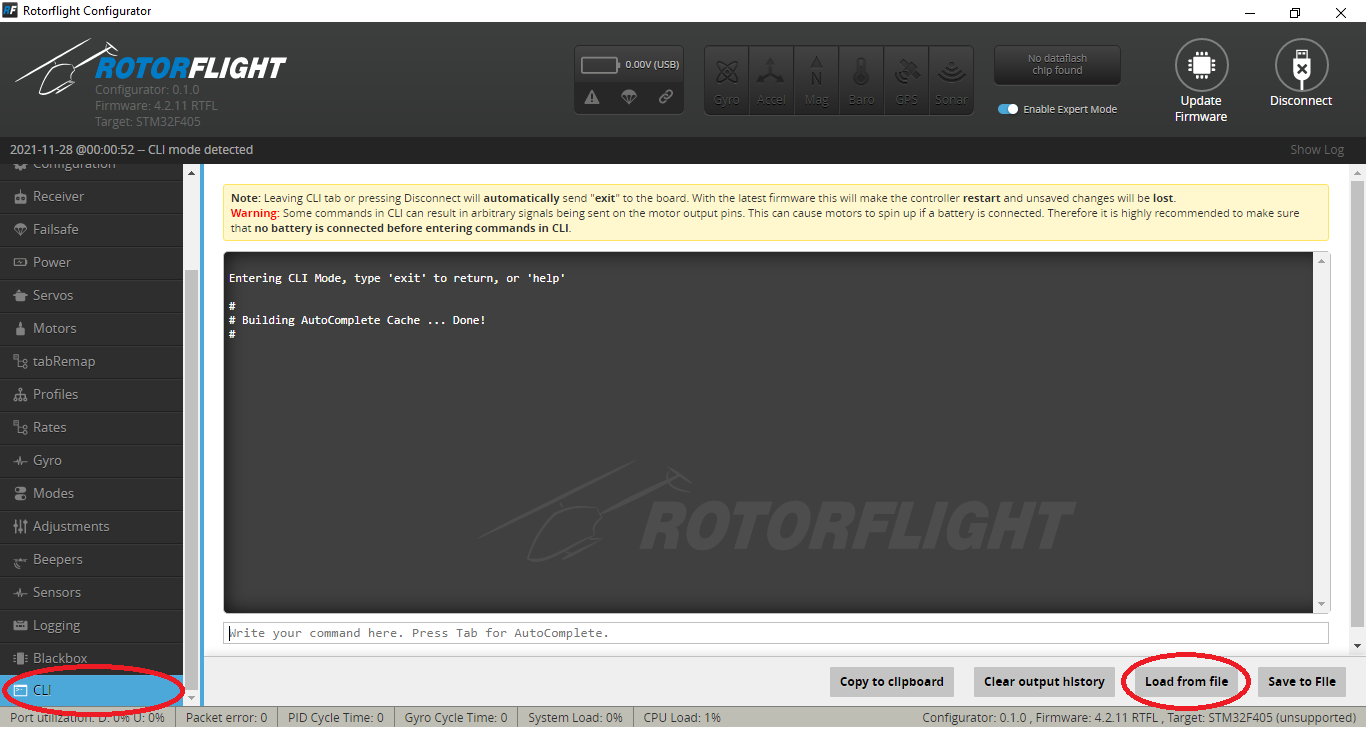
1. Wait for the Programming Successful and click “Connect”



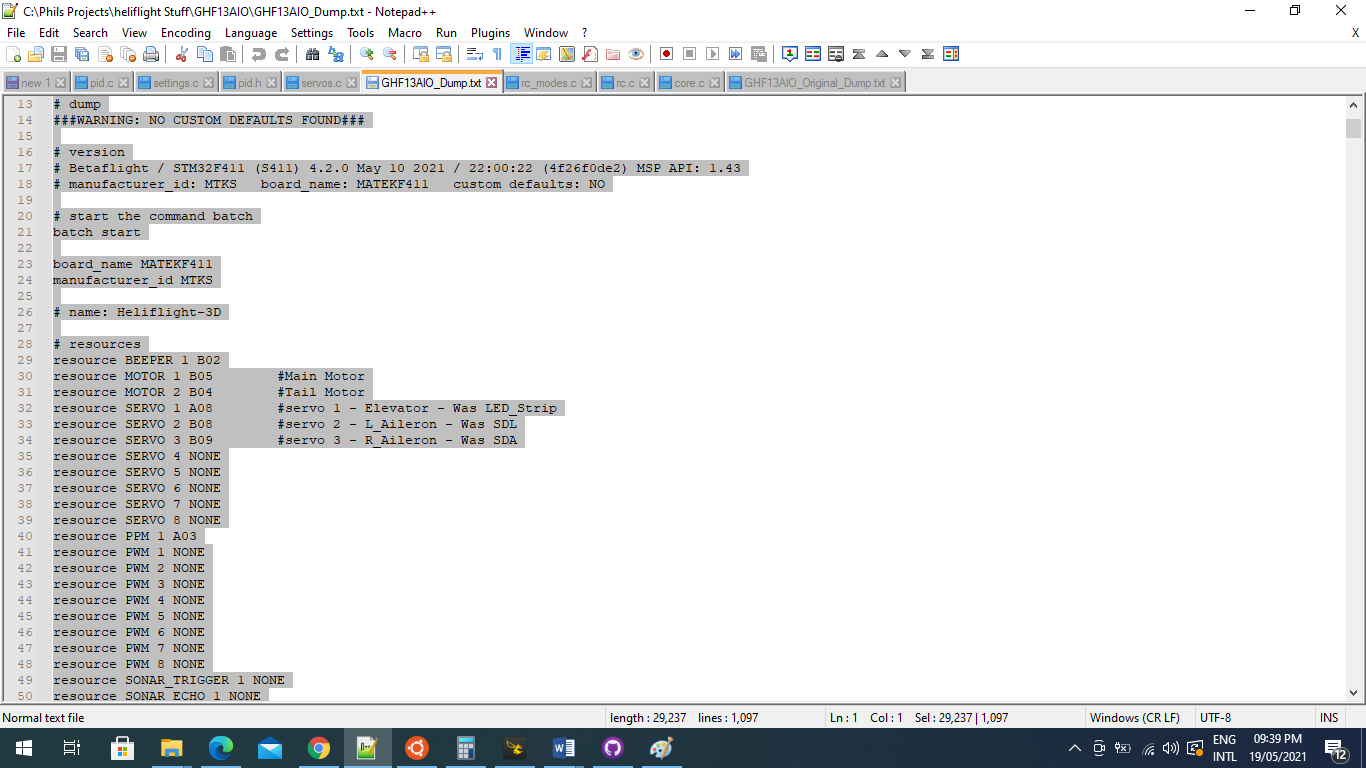
1. Apply custom defaults (it will say there are none which is ok. This will be sorted in later releases)



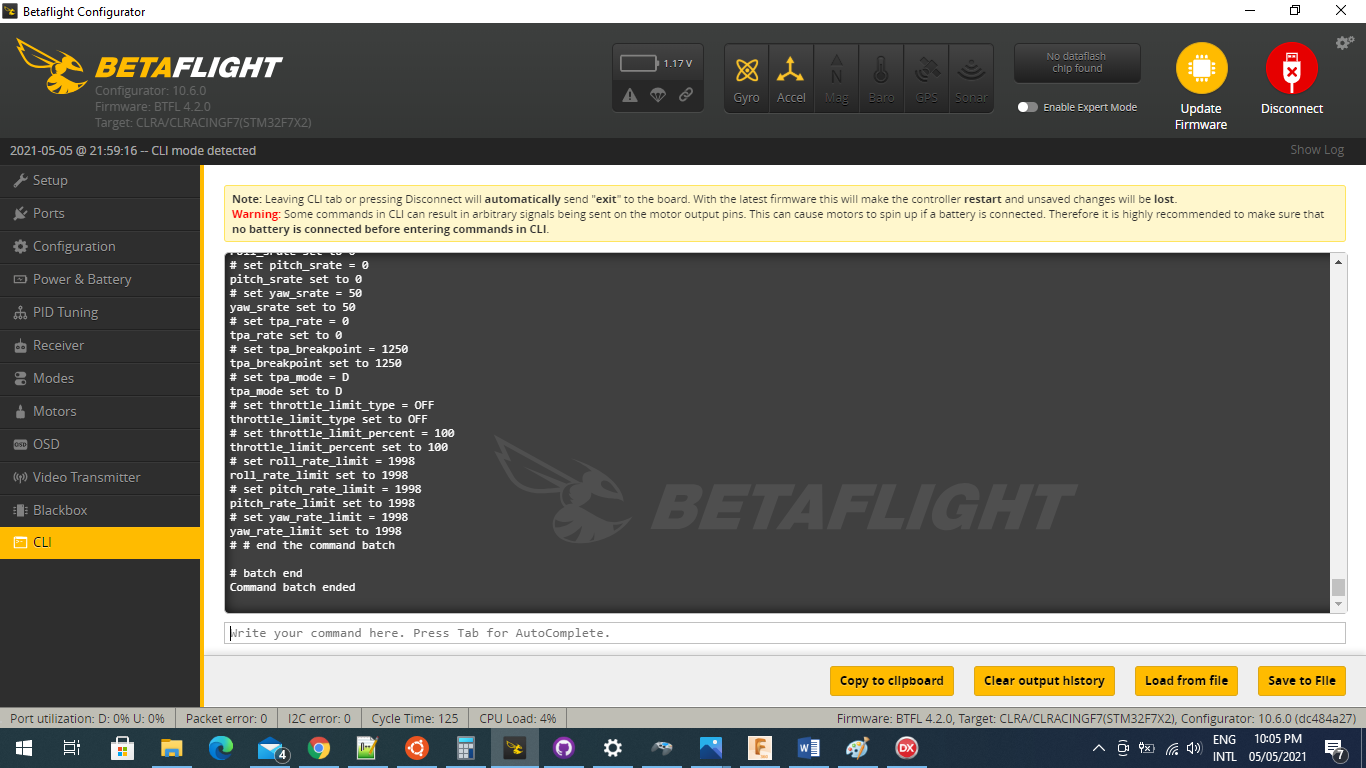
1. Reconnect and select CLI



1. Open the PlayF4\_Dump.txt file. Select all of the text in the file (ctrl A) and copy (ctrl C).

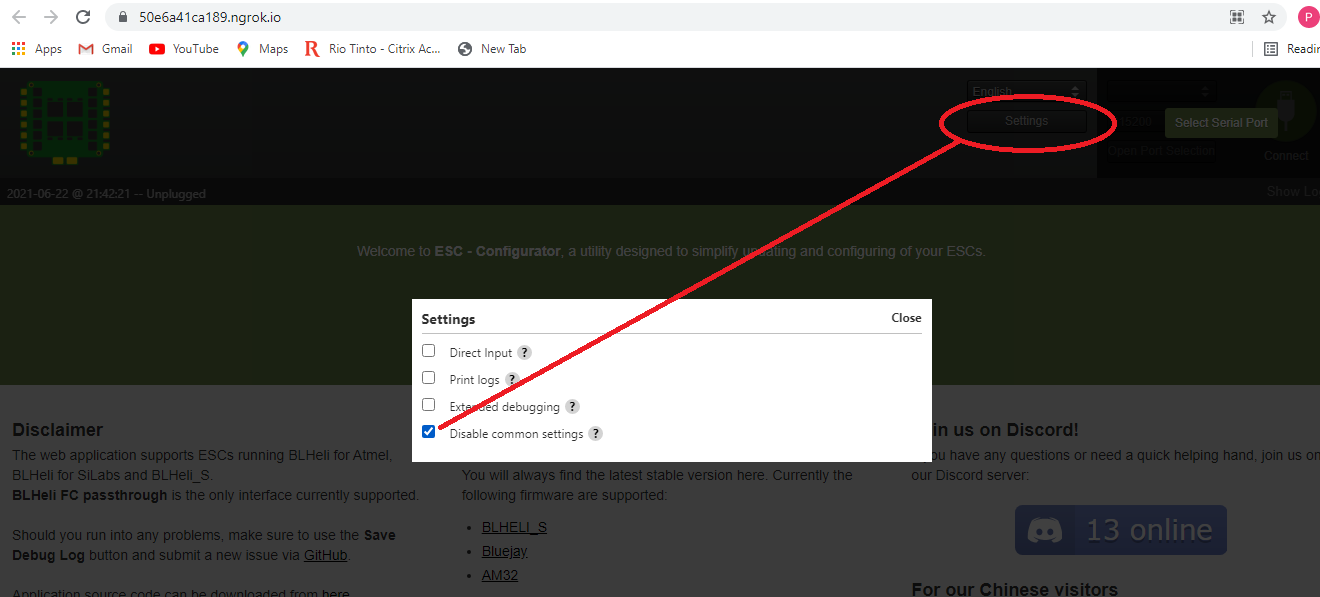


1. Paste this into the Betaflight CLI and click ENTER (down the bottom where it says write your command here). The settings will then be loaded.

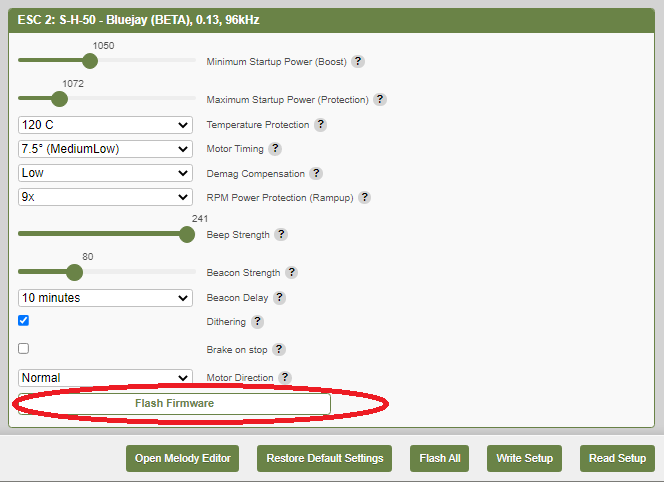


1. In the CLI type: save [ENTER] (really important. Config won’t be saved if you don’t save….)
2. Now we need to set up the bi-directional Dshot so that the motor speed telemetry functions. This FC has BLHeli\_s ESC’s which don’t natively implement bi-directional Dshot. There are three options for this. JESC (paid), BLHeli\_M or Bluejay like I have used…..

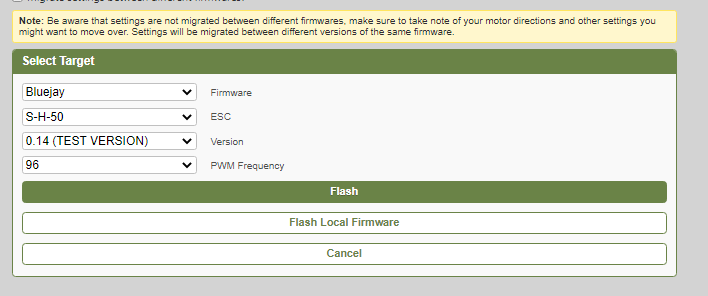
Go to the Bluejay configurator. Please note this is a test version which enables each ESC to be loaded with different settings. https://esc-configurator.com/. Click on Settings and tick the disable common settings so you can load different settings for the tail and main motors.



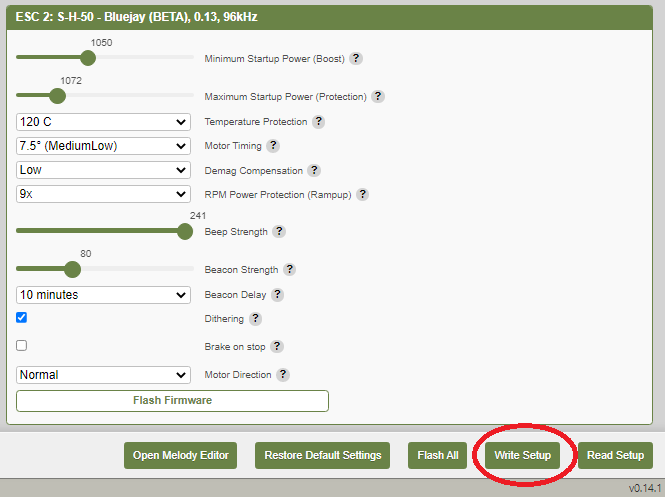
1. Connect and read setup. Scroll down to the ESC 2: Select firmware



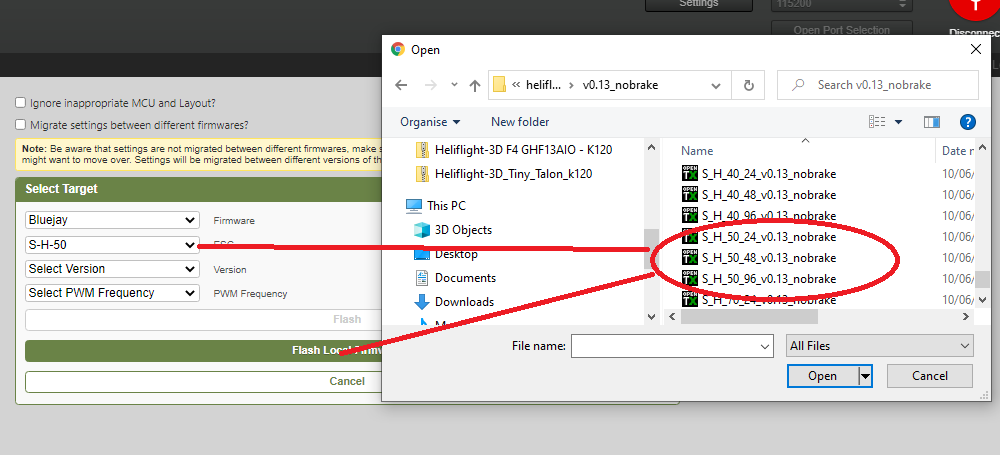
1. Select [Flash] as below. Version 0.13 or 0.14(TEST VERSION) implements the Bi-directional Dshot. I used the 96kHz for the tail.



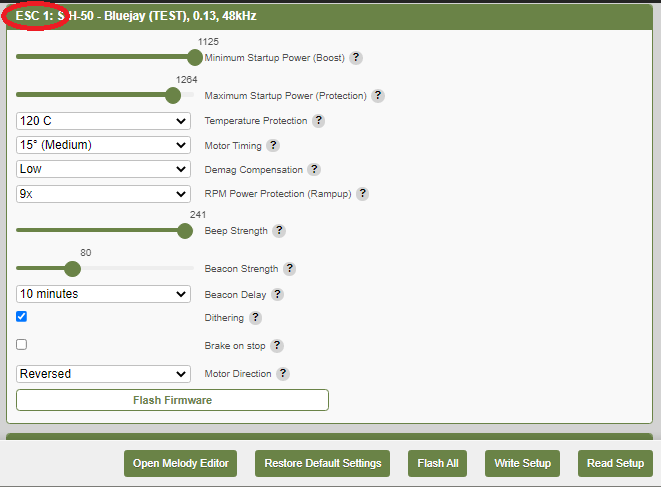
1. After flashing is complete. Set up parameters for the tail and write setup. These are what I have.



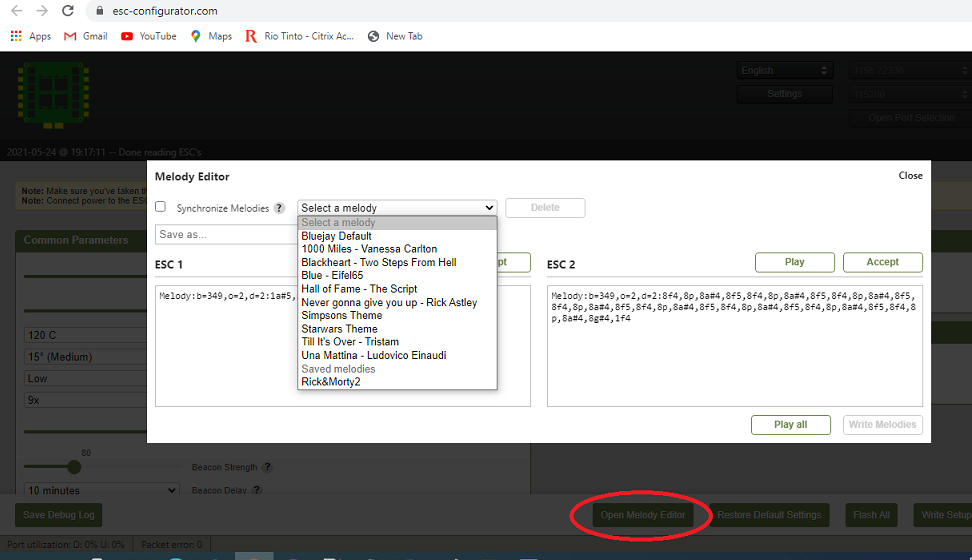
1. Scroll up to ESC 1: This ESC should be set up without damped-light mode. This is done by flashing the ESC firmware file as supplied in the zip file. Select either the 24, 48 or 96 kHz version. I used for the 48kHz for the main.



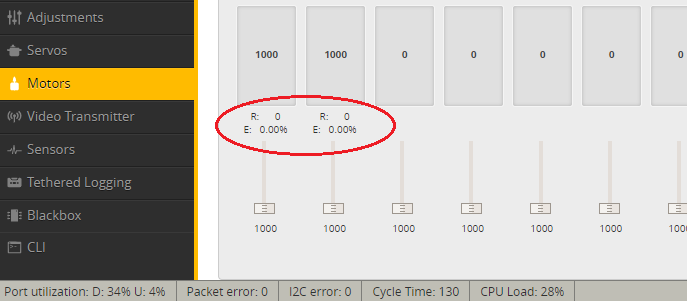
1. After the firmware is downloaded set the configuration and [Write Setup]



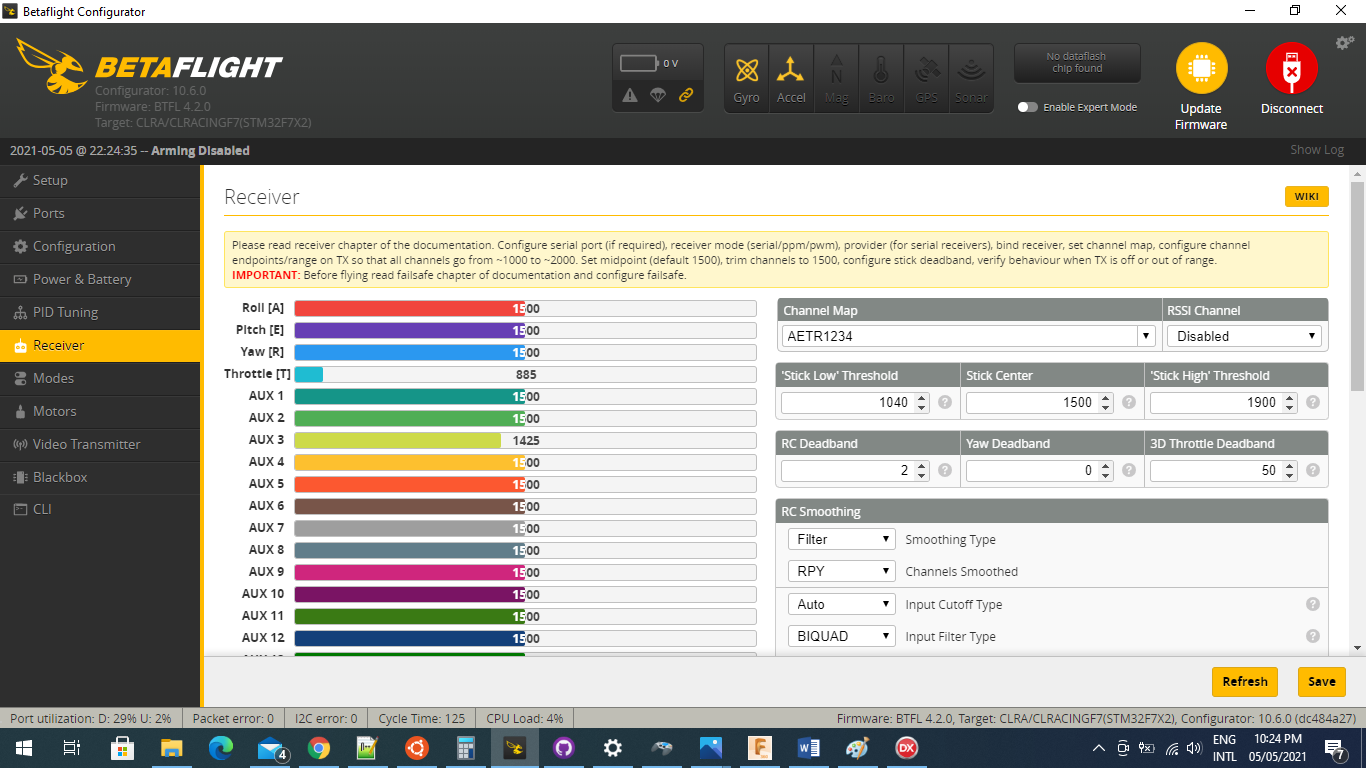
1. If you are particularly nerdy….. Give the melody editor a try. This changes the startup tone of the ESC’s (seriously though you will be judged harshly if you chose the Rick Astley one)



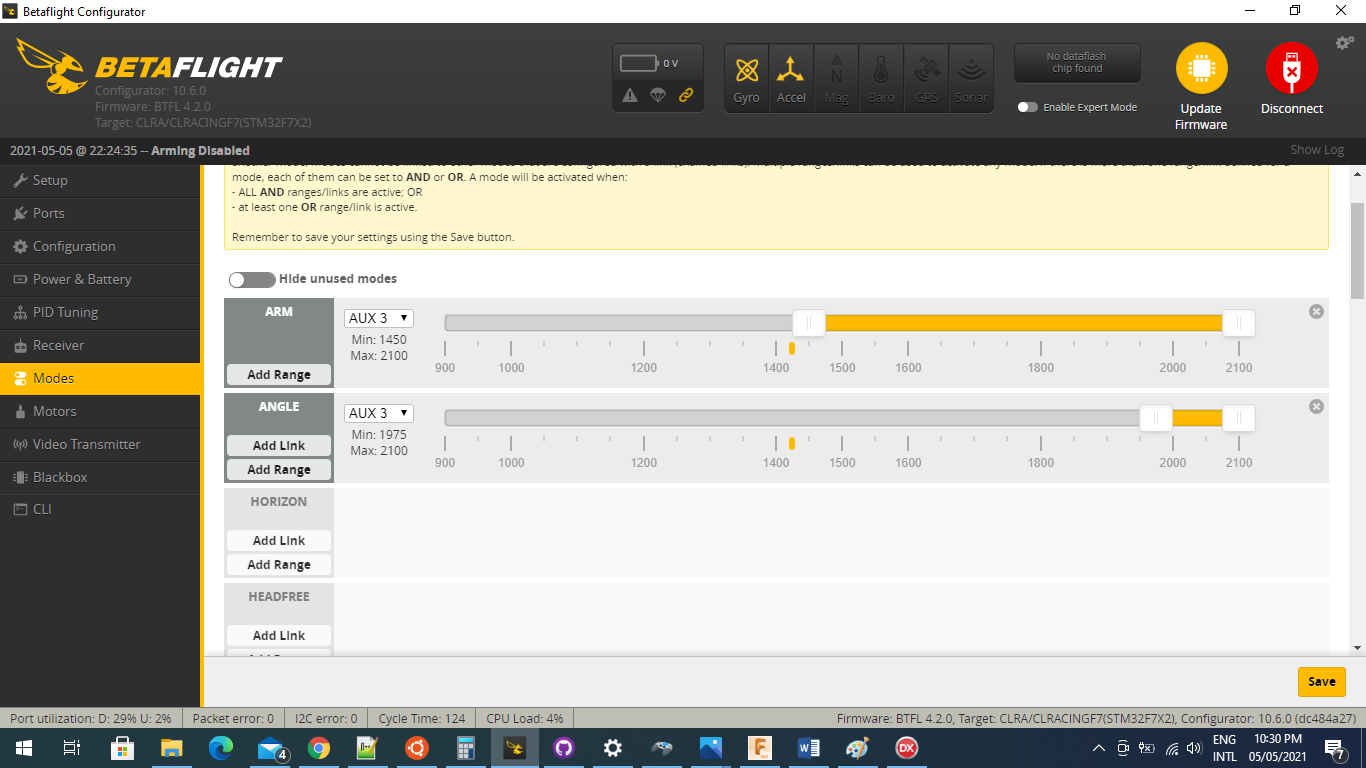
1. Open Betaflight again and connect. In the Configuration tab select the Motors tab. With the battery powered on, check the bi-directional Dshot is working. It should look like this (E: 0.00%). If it is (E: 100.0%) it is not working and you should review loading Bluejay.



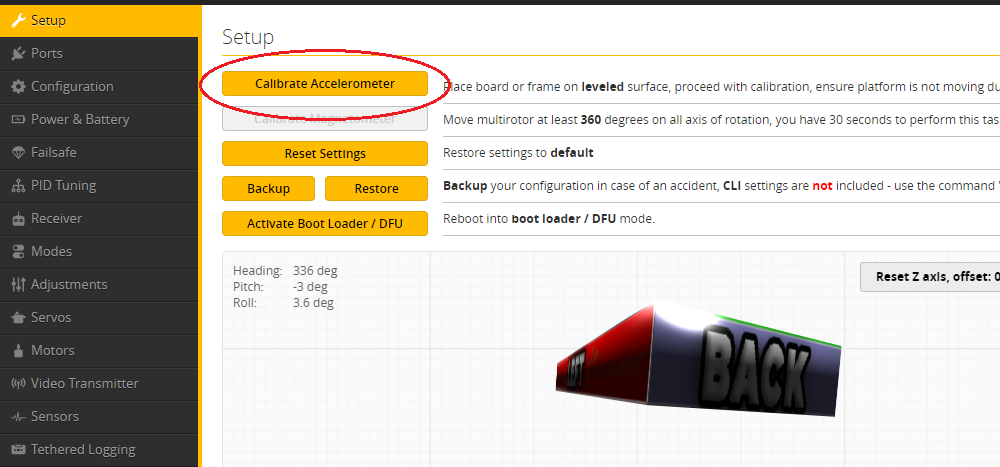
1. Configuration tab select your preferred receiver. Mine is SBUS so that’s what is configured in the dump file.
2. Open the receiver tab and make sure your radio is set up to centres and operating correctly. The PITCH has to be on ch5. I have a FUTABA so pitch is natively CH6 so had to mix CH6 it to CH5. Your radio channel map needs to be AETR1234.
3. Adjust the stick centre and trims on your radio so they are the same and the FC does not see a stick input with the sticks at centre.



1. In the modes tab set up switches to operate the ARM and ANGLE modes. Selecting the ANGLE mode enables the rescue mode. Horizon mode can be configured if 6G mode is desired.



1. On the Setup tab calibrate the accelerometer. Make sure it is nice and level

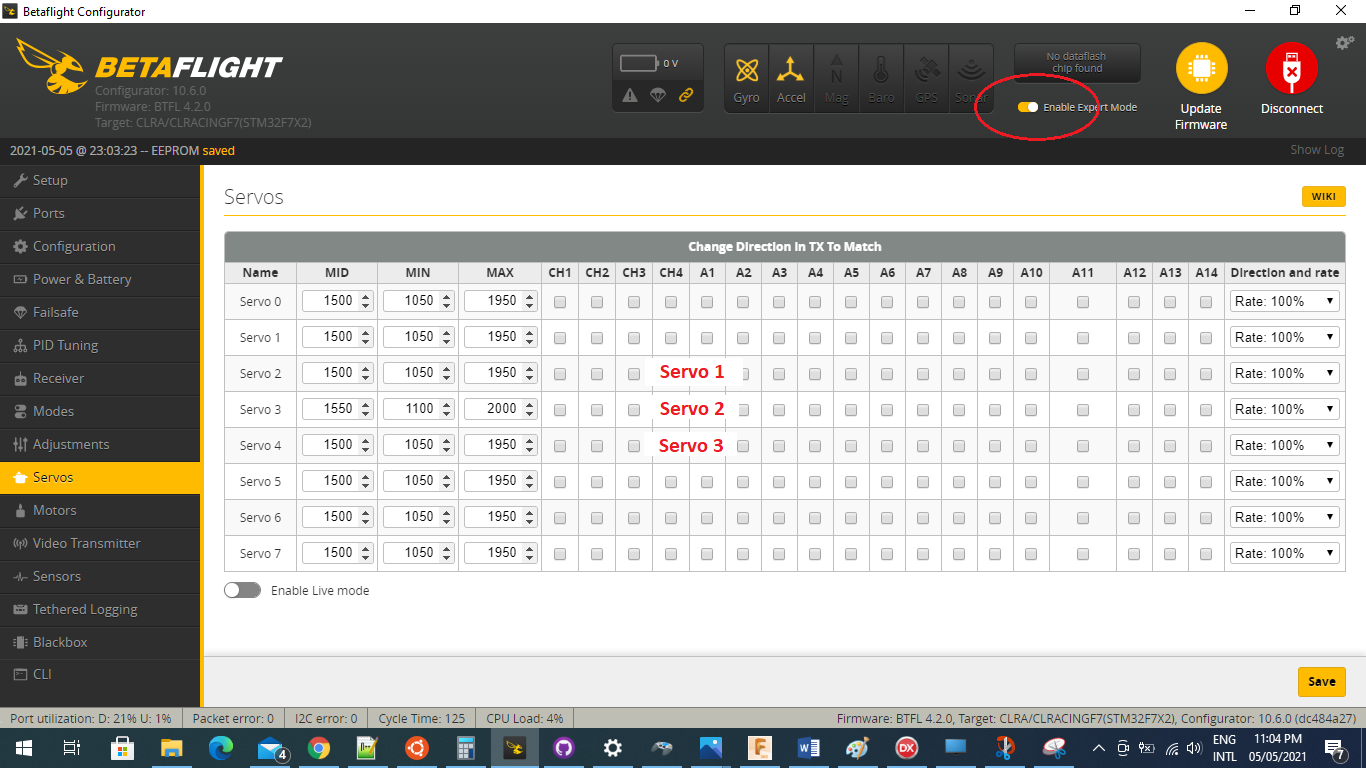


1. Setting up servos. Set the enable expert mode and click the servos tab. The servo numbering does not line up. Servo 1 is configured via Servo 2 etc shown in the pic below.

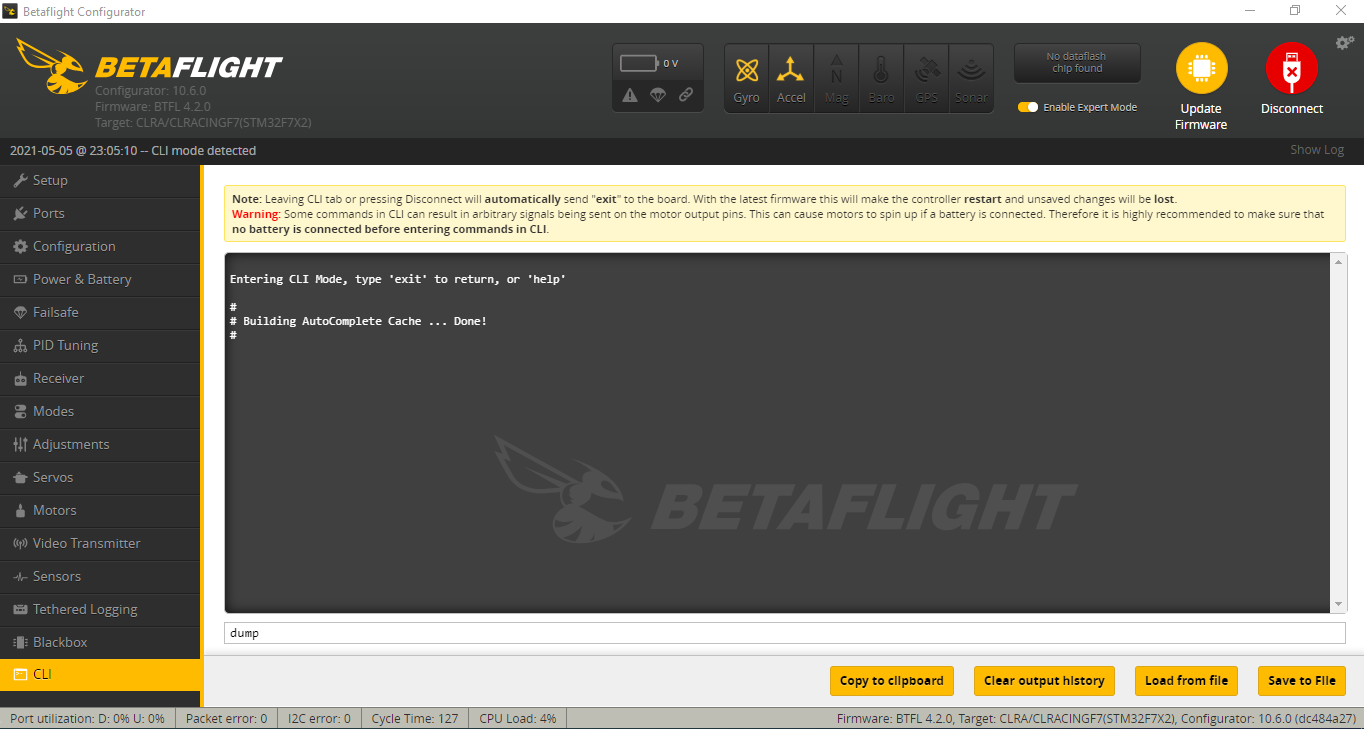
a. Change the mid point until the servo horn is in the right position. [Save]

b. Change the min and max to be equal values above and below the mid point. The range (difference between the min and max) for each servo can be changed so that the Blade angle positive and negative are the same depending on head geometries. I’m not that technical so I just make them the same. In the example below I shifted the servo 2 up by 50. [Save]

c. Check the servos have full range of movement without binding. If not you will need to reduce the servo range.

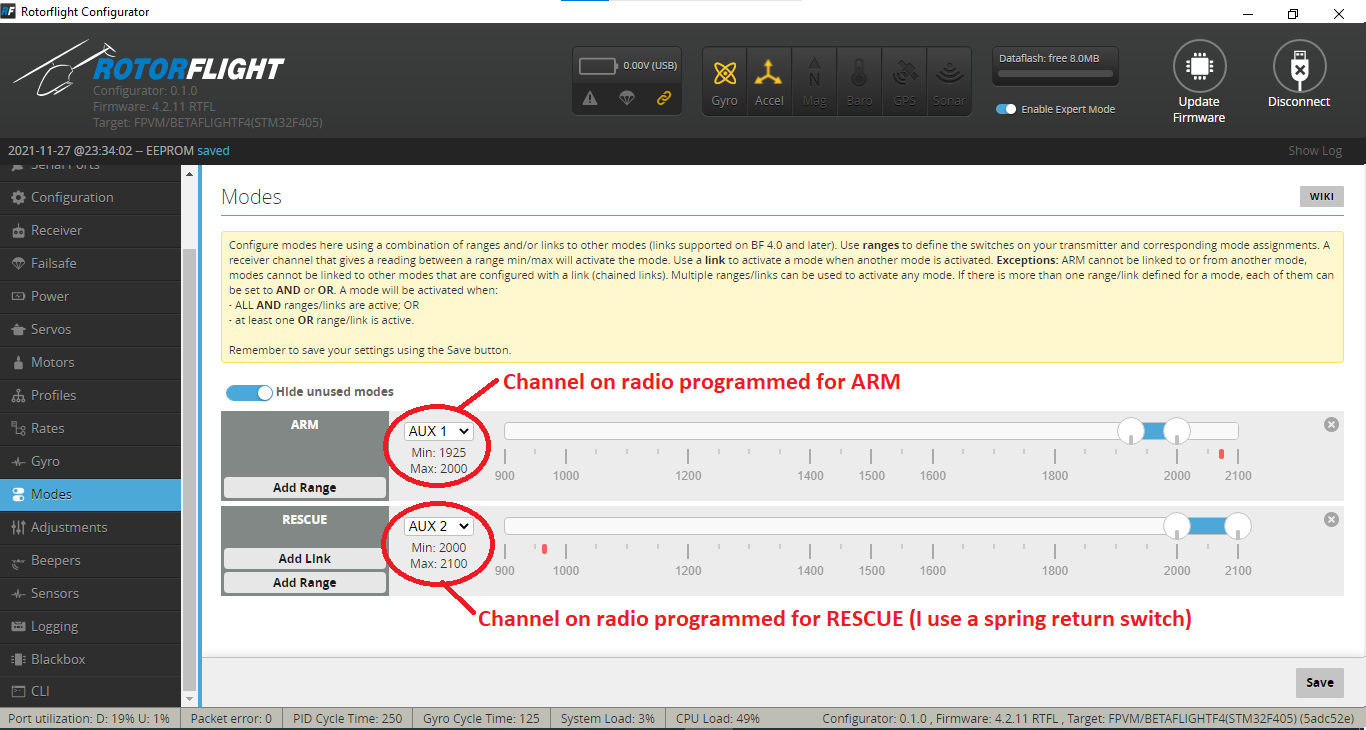


1. Backup your files once you are done. Open the CLI and type: Dump [enter]. Select, copy and paste the entire output into a text file and save it. This is your dump file with all of your configuration. If you re-flash firmware or build another FC use your file at step 7.



That’s it. Go fly.

PID tuning

It should be quite flyable with the PID parameters as they are. If you want to change these settings you can do it through the PID tuning tab.

Rescue mode:

