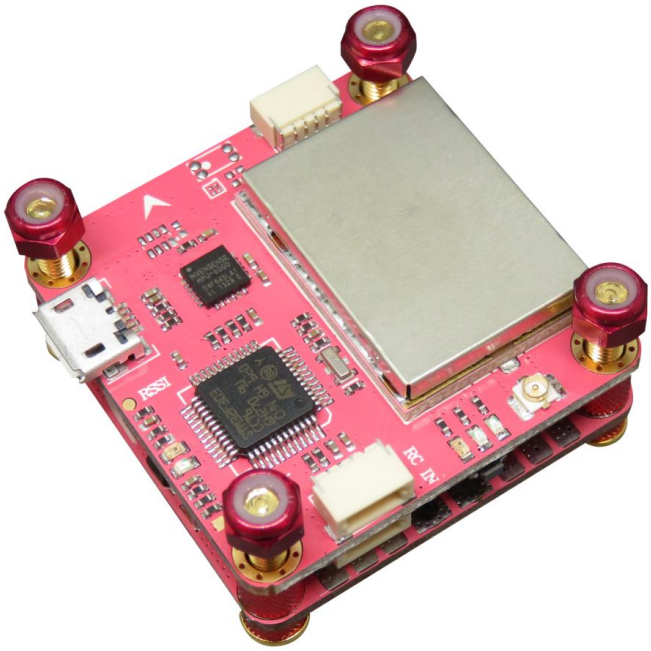
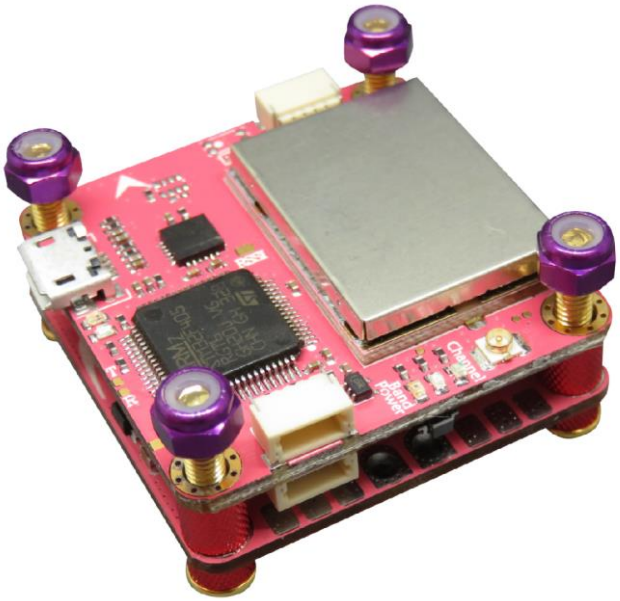
Flytower PRO Instructions





Instructions for using

1, Please install ANT (must be done) before debugging or testing VTX（and OSD）, or lead to VTX not working properly.

2, please use proper tools to install Flytower .It is easy to damage the PCB components by using sharp tools. (warning: Bear in mind that screws do not install too tight between every layer, so as not to destroy the PCB and electronic components).

3, When you debug or test flight control Please remove all the propeller; Try not to test indoors, So as not to cause safety accidents. Install the propeller before a test flight, please check again.

4, Please check and adjust ESC plate welding, thus brings all the losses and problems, or you should face the consequences.

5, Please do not fly your drone near the crowd, for all the losses from the crashed aircraft, you should face the consequences.

6, For your safety, please do not use more than 4s battery, Using more than 4s battery would cause safety

risk, we will not undertake any responsibility.

7, Before power on, please check the positive and negative pole again to make sure whether there is a short circuit .(you also have to check that whether there is short circuit between your motor cables and frame).

8, Please use original screws and fixings to install Flytower.

Product specifications

4 in 1 ESC	PDB	Integrated
	Battery Monitoring	Integrated
	FC Power	Integrated
	Operating Voltage	2-4S Lipo
	Maximum continuous operating current	4*40A
	Maximum instantaneous operating current	4*45A(5 Seconds)
	Oneshot 125/42/ Dshot 150/300/600	YES
	BlheliSuite Configurable	YES
	Firmware Version	BLHeli_S/Dshot 150/300/600 16.6(A_H_15/L_H_0)
	Board Size	36*36mm
	Weight	10g
FC&VTX Board	Firmware Version	Betaflight:3.1.7 OMNIBUS(Flytower PRO F3) OMNIBUSF4SD(Flytower PRO F4)
	Configure	Betaflight
	VTX Power	OFF/25/200/400mW(MAX 800mW)
	CH	48CH
	OSD Firmware	Betaflight OSD
	Video Camera Voltage	Any stand by 5V Video Camera
	Board Size	36*36mm
	Weight	11.4g
Flytower F3/F4 PRO	Any Board weight	21.4g
	Total weight	28.7g
	Installation height(Add air-cooling fin)	15mm/20mm
	Screws	M3*18mm
	Recommended Rack Plate Thickness	Not more than 3mm （3mm above the appropriate extension of the screw）

The Flytower PRO F3/F4 board was designed basing on OMNIBUS/OMNIBUSF4SD (Betaflight) FC and highly integrated with OSD,BEC,4 in 1 BLHeli_S/Dshot 600 ESC and VTX with audio (OFF/25/200/400mW).It gives you all the features what you need in FPV, which makes you easily get into FPV racing.

★ Practical - Easy to access connectors

★ Configurable - Choose to use connectors

★ Stackable - Mount our 4 in 1 ESC

★ Compact - Only 36x36x15mm.(Add air-cooling fin MAX 36*36*20MM)

★ Weight - 28.7 grams and 2 stack boards

★ Professional - Symmetrical, Neat and Tidy and Easy to install in any racing drone

★ 36x36mm board with 30.5mm mounting holes

★ STM32 F405 MCU(Flytower PRO F4), Runs Betaflight firmware(supported from V3.1.7)

★ STM32 F303 MCU(Flytower PRO F3), Runs Betaflight firmware(supported from V3.1.7)

★ SD card slot

★ Use MPU6000 as Acc & gyro over SPI Bus

★ STM32 controls OSD chip over SPI in DMA mode, less CPU using, faster rate

★ Micro USB socket

★ 1x 4pins JST-SH sockets (PPM, PWM, SERIAL RX, GPIO, ADC, 3V, 5V, GND)

★ The on-board pins are easily connected to our next 4 in 1 ESC &PDB board

★ Internal VTX with audio (48CH) (OFF/25/200 / 400mW adjustable power video transmission)

★ 1x 4pins JST-SH sockets with BUZZER & WS2811 RGB LED

★ 1x 4pins JST-SH socket for Video and Audio transmission

★ 1 IPX sockets easy connect the external antenna

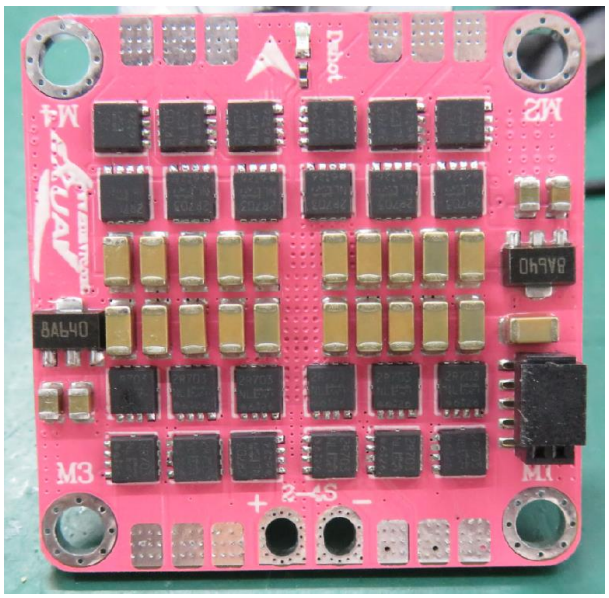
★ 4x 3 Pads for motor output

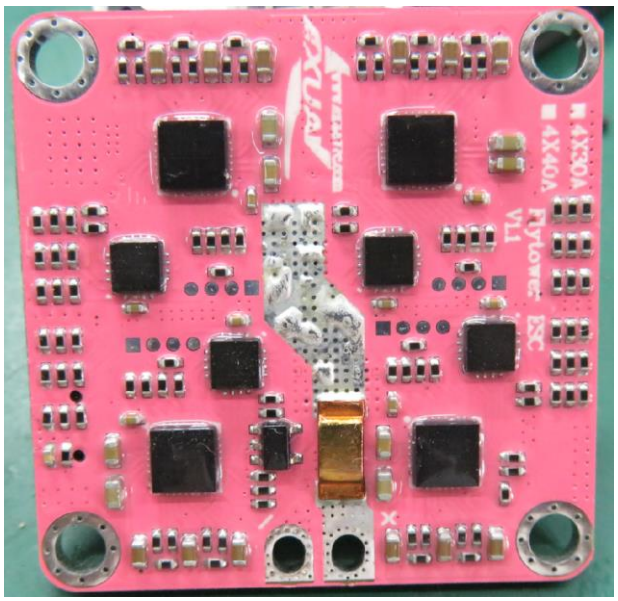
★ 1x2 Pads for batter in easy solder

How to solder and Install the Flytower PRO

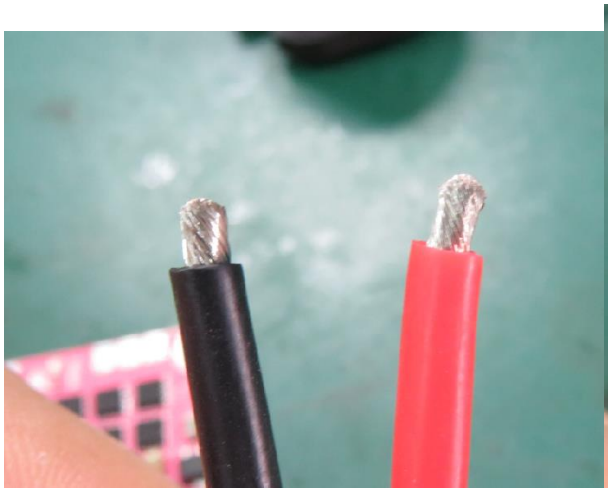
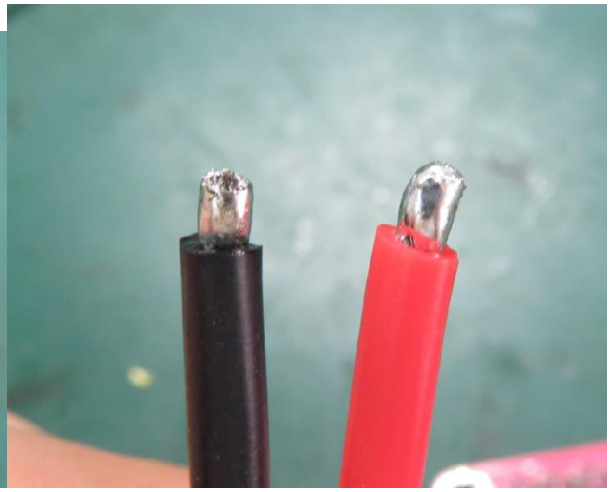
Weld and Install the Flytower PRO

When you receive the product and open the package, see the ESC board as shown below, you need to follow the instructions of the following tutorial .You have to step by step and you will easily complete your work of welding.

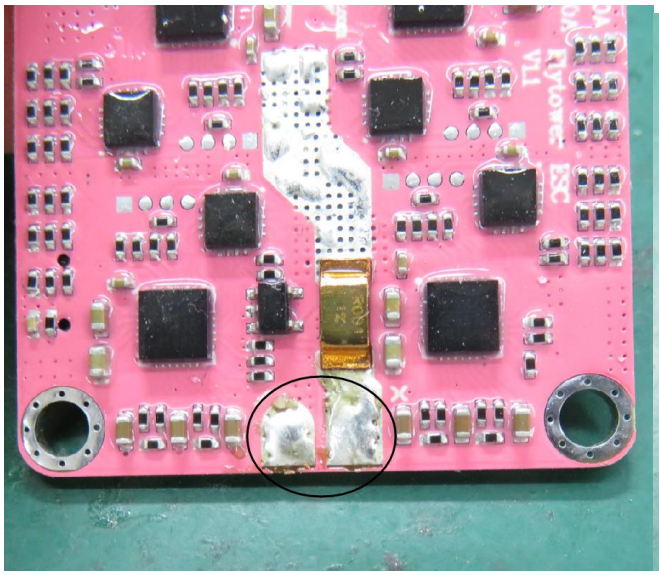
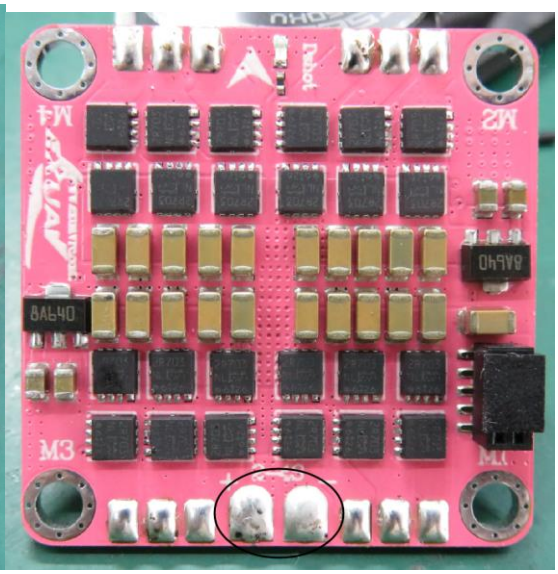




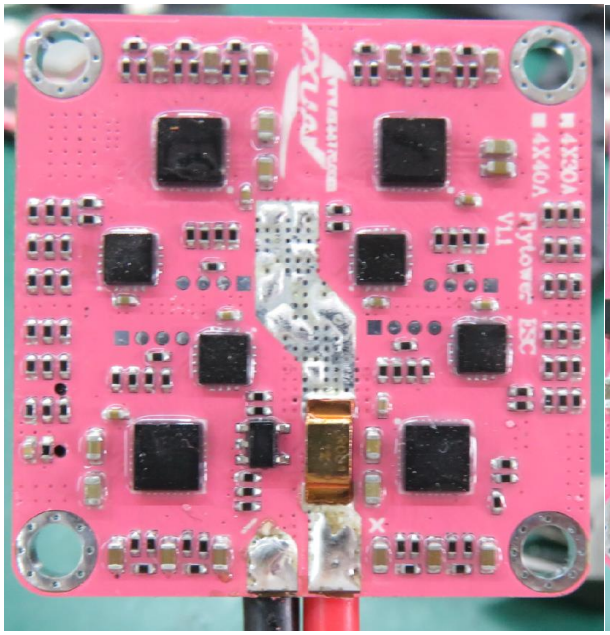
1, Please change the length of the power supply cable to fit your need, and we recommend to use the cable of# 14 AWG, and peel off the outer skin of the cable, the length of the metal is about 3-5mm , and twist the peeled metal parts, then you could add solder to the stripping of the power cord which can make it more stable.

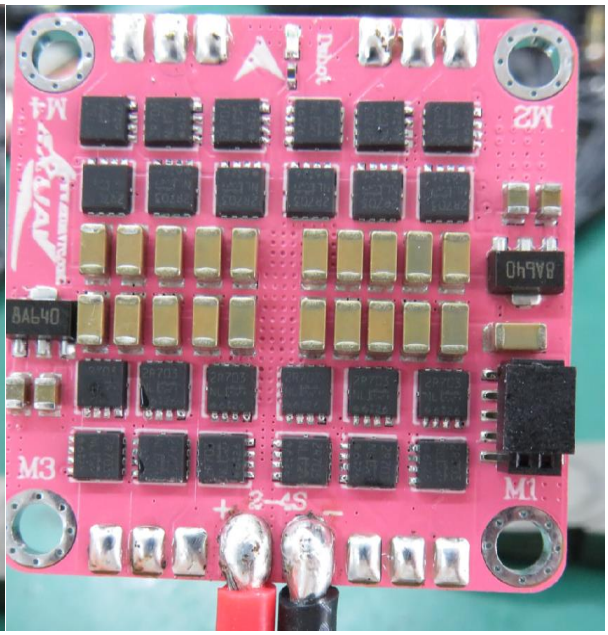



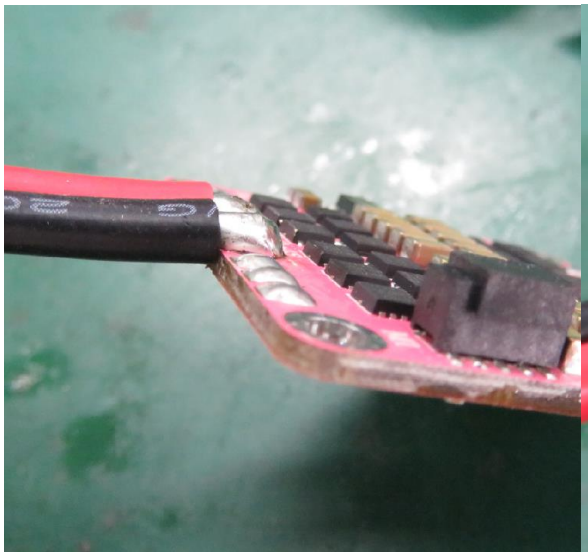
2, Add solder to both sides of the pads of ESC board and allow it to form and penetrate solder. And add the appropriate solder to the motor pad.

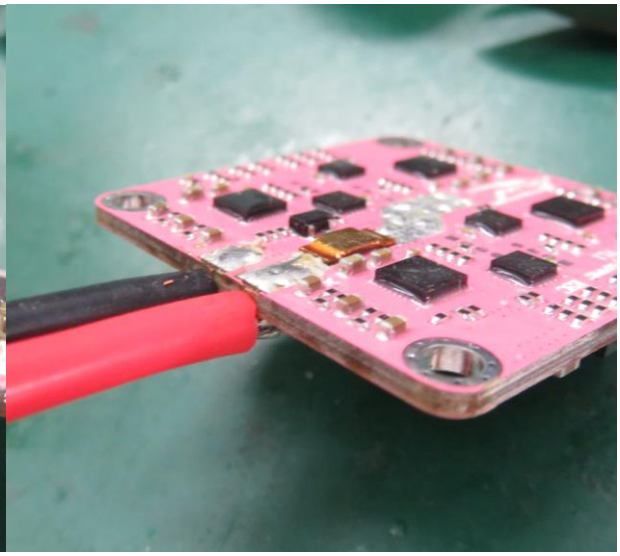



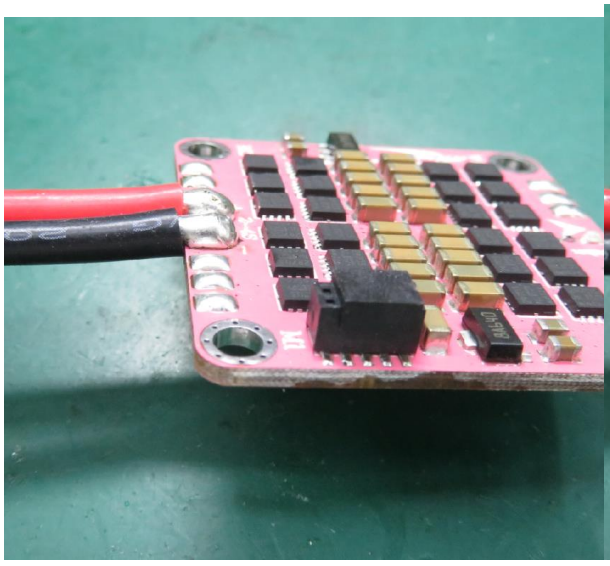
3, Solder the power supply cable, as shown in the figure below and position the solder, and you are ready to change the length of the motor cable.

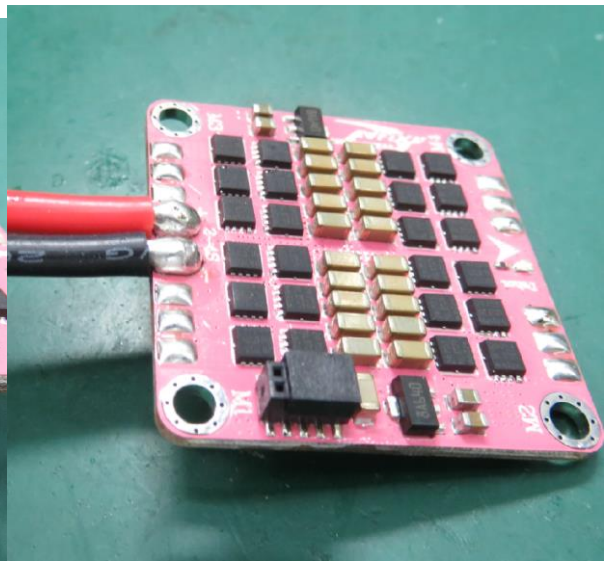








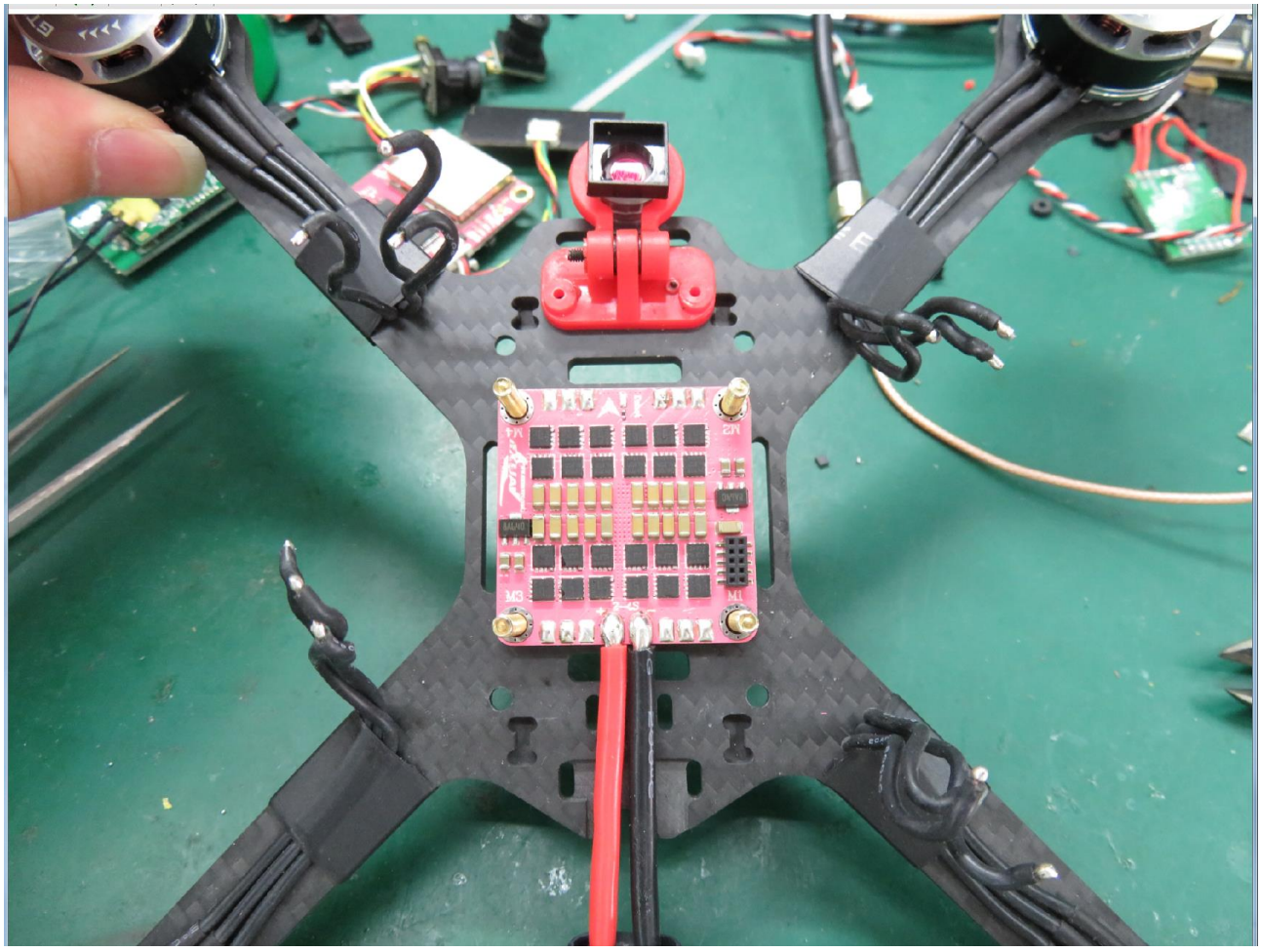




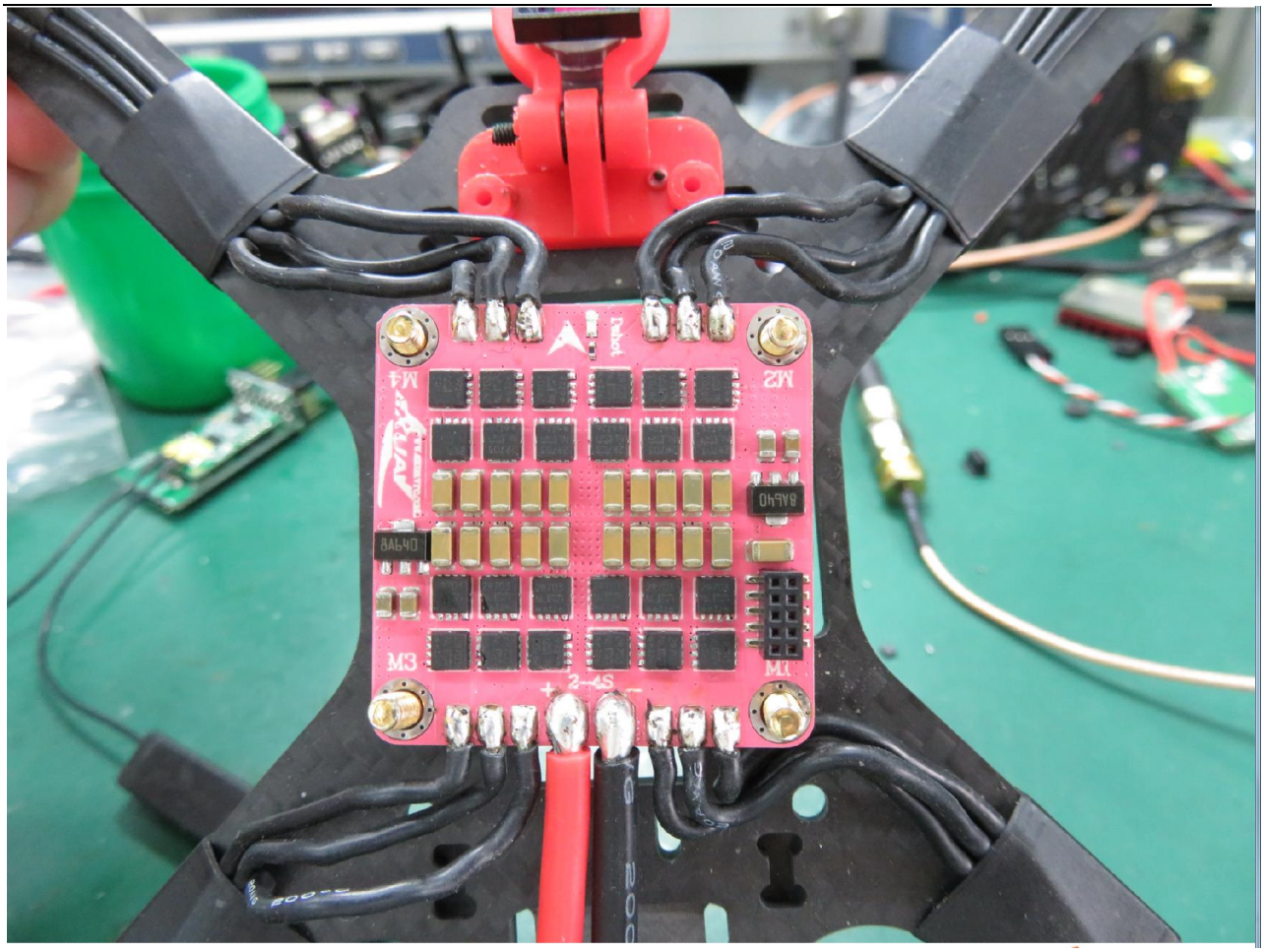
4， Install 4 motors and the mount the ESC board with the power supply cable to the frame. Then add the solder to the motor cable and solder it with the ESC board as shown below:

(Remember to add the solder to motor cables when the solder is installed. You have to use the standard screws which is in the box to avoid damaging the ESC board in the process of welding)

Before the welding is completed

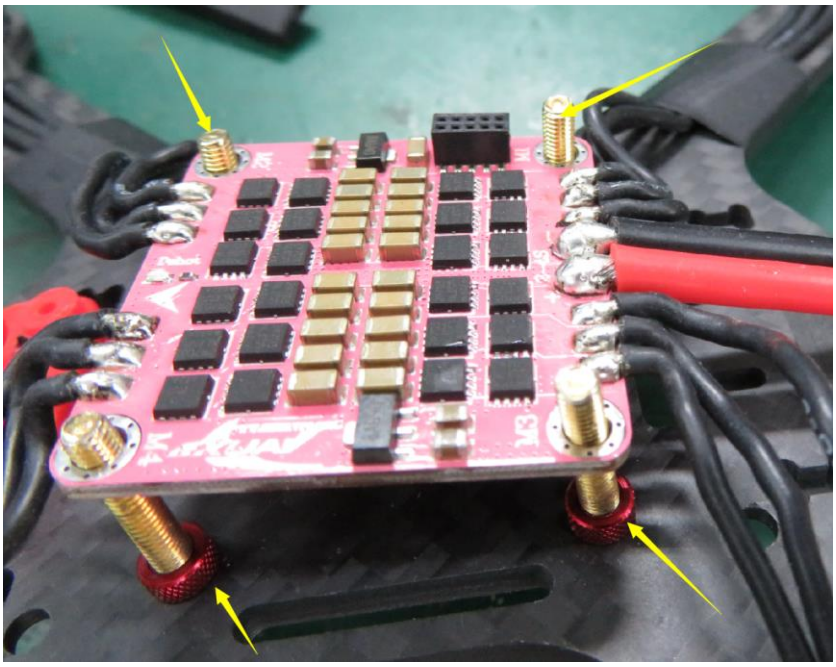


After the welding was finished



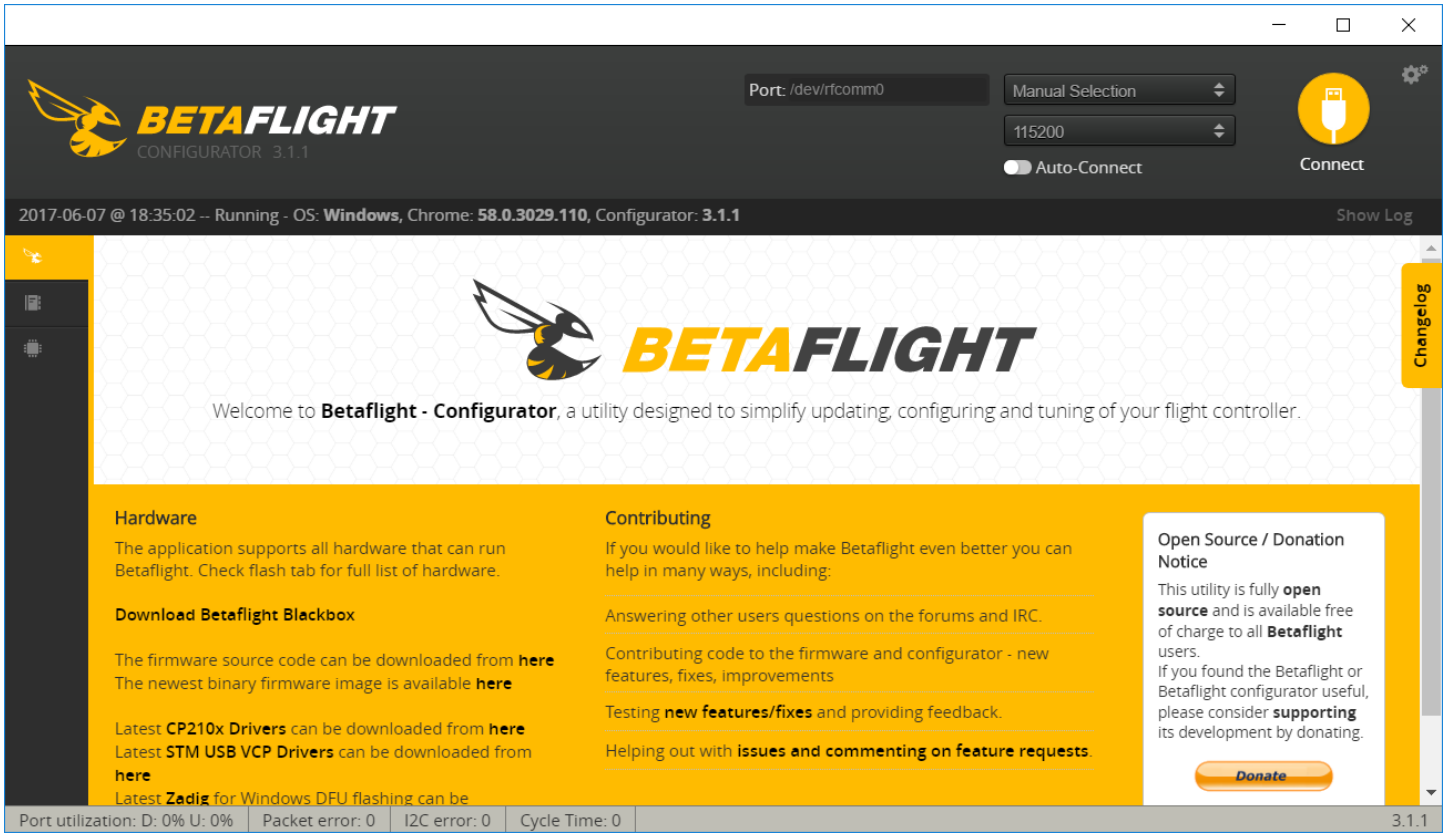
Warning ：

When you are ready to solder the ESC board, you must install the screw bracket as indicated by the yellow arrow， as shown below to ensure that the ESC plate is not damaged during the solder process.



5, When the above solder is completed, please use the multimeter's ohm file on-off function to check whether there is a short circuit between each pad, you need to carefully check the reliability of the solder, to avoid short-circuit which will cause the stop working of your motors, even damage your ESC board.

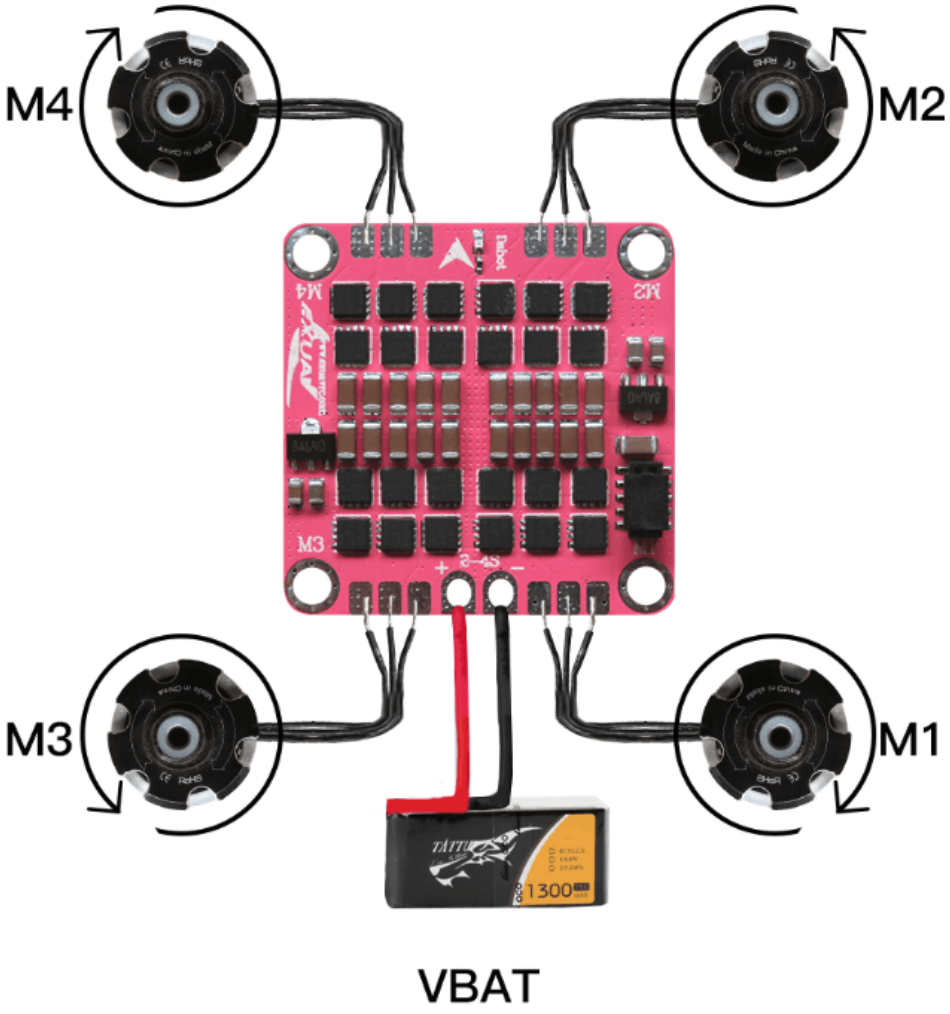
Betaflight



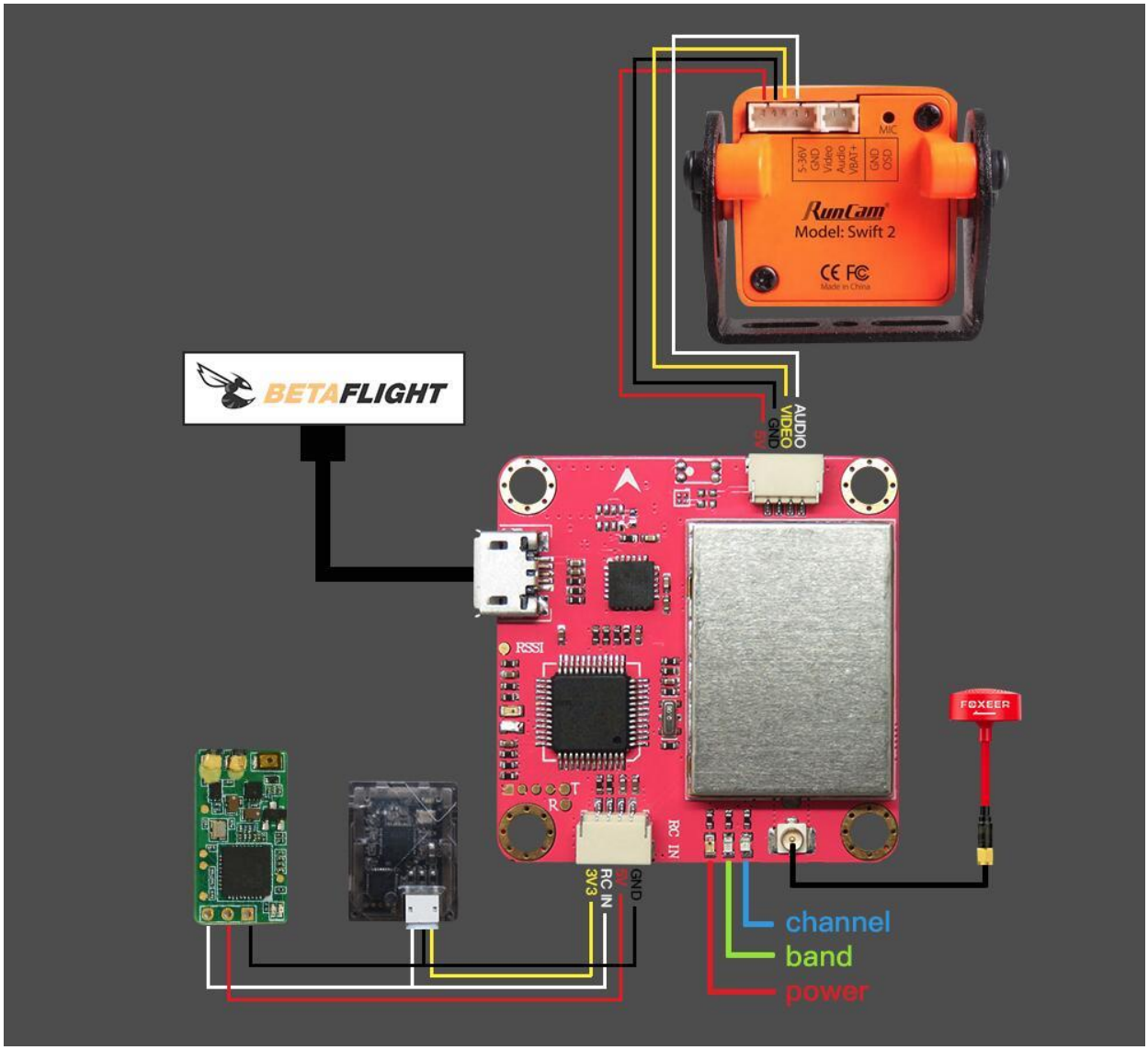
https://github.com/Betaflight

The hardware connection diagram

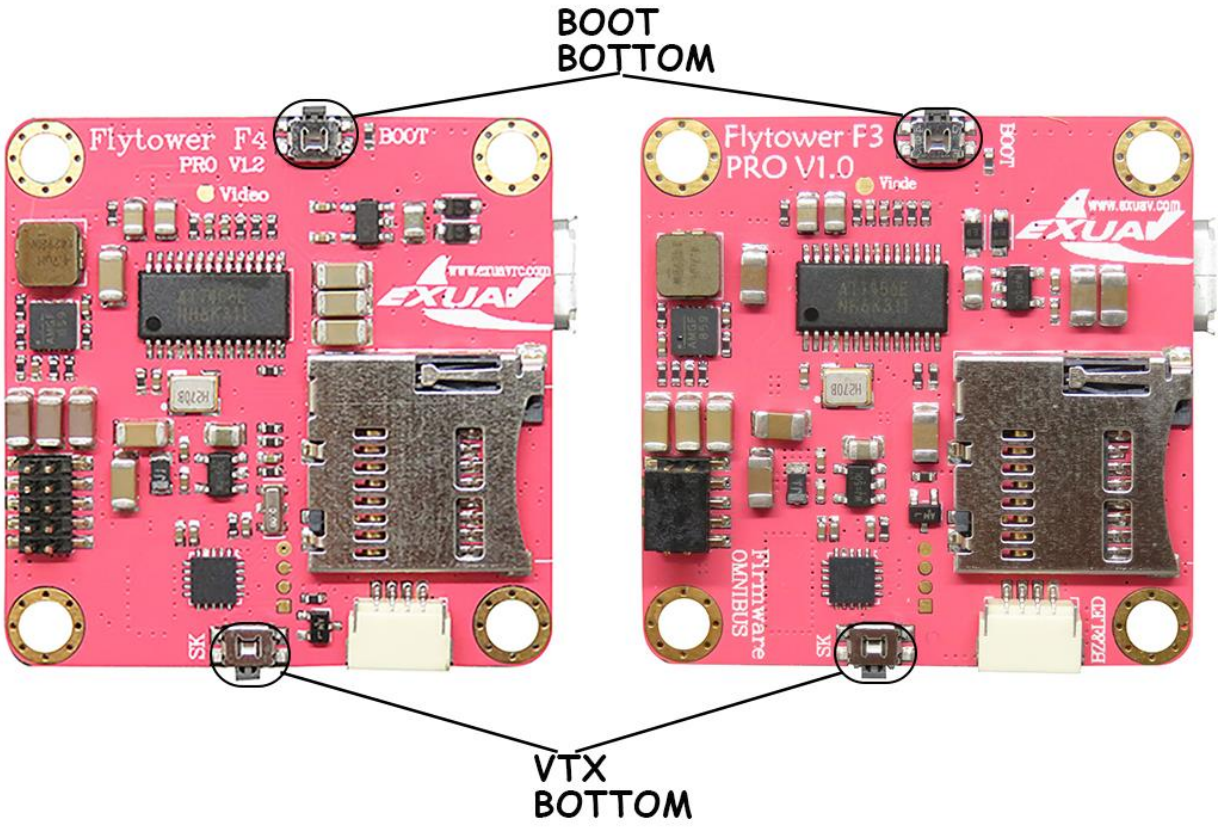
1,4 in 1 Board

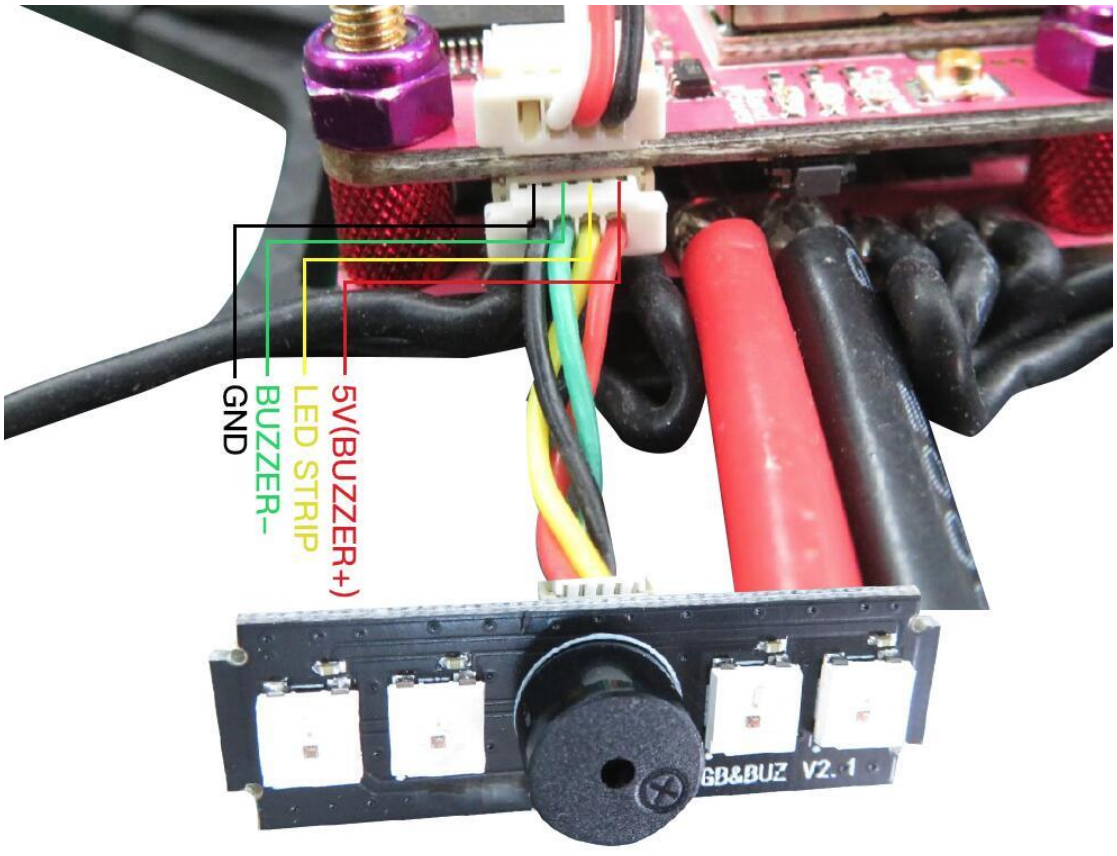


2,FC board TOP

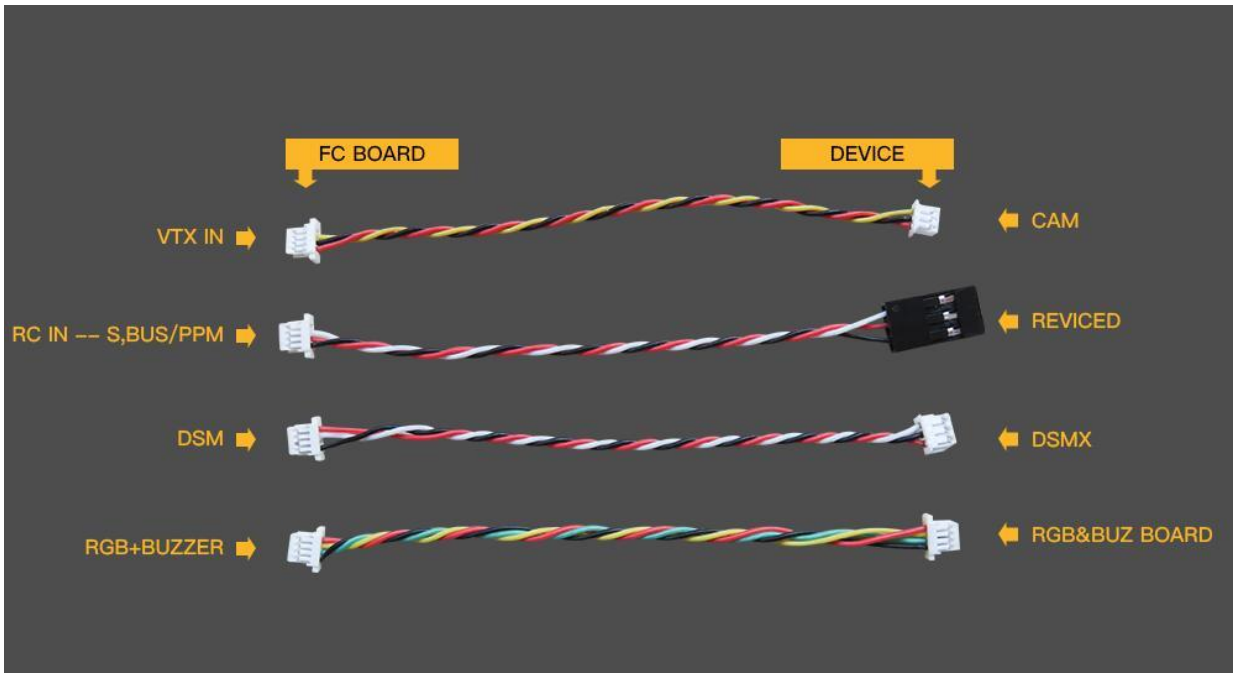


3,FC board BOTTOM


BOOT
BOTTOM
Flytower F4
PRO V1.2
Video
BOOT
SK
Flytower F3
PRO V1.0
Vinde
BOOT
Firmware
OMNIBUS
SK
VTX
BOTTOM


GND
BUZZER-
LED STRIP
5V(BUZZER+)
GB&BUZ V2.1

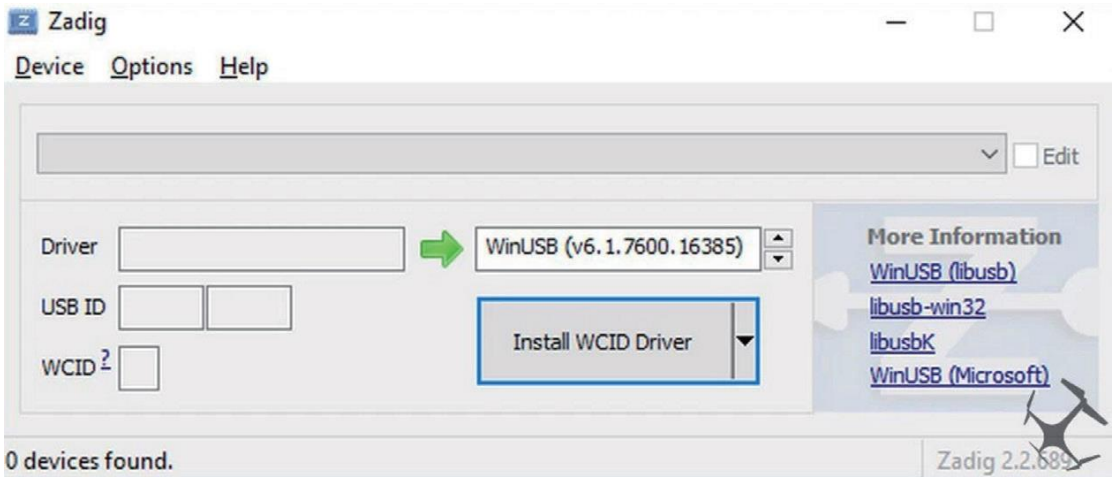
4,Cable define

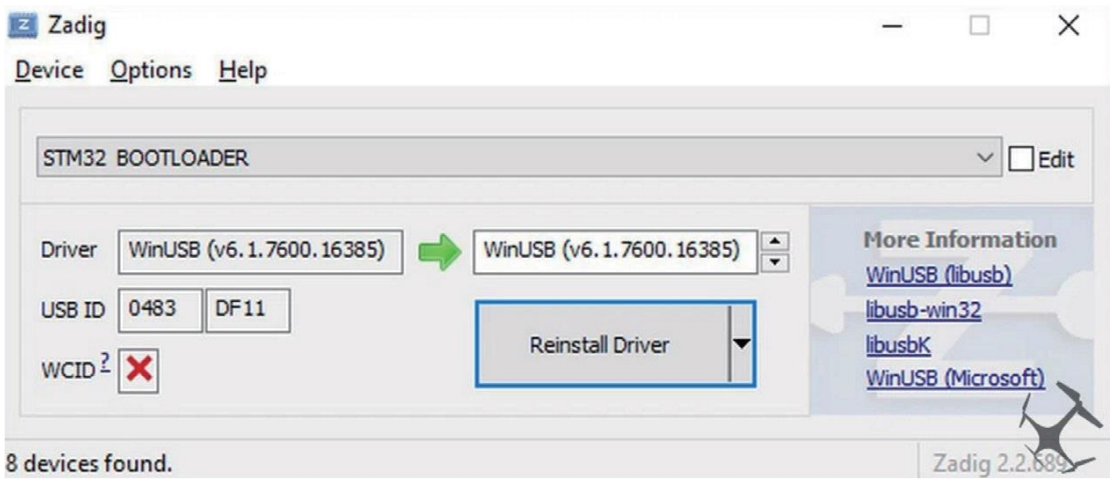


How to use the onboard USB port updated firmware in GUI on windows

To flash the firmware you have to enter the so called DFU mode. On Windows 10 I had to use a tool called Zadig (download and start it) to be able to switch drivers for DFU mode to work. In order to switch drivers you have to take the following steps.

Download: http://zadig.akeo.ie/





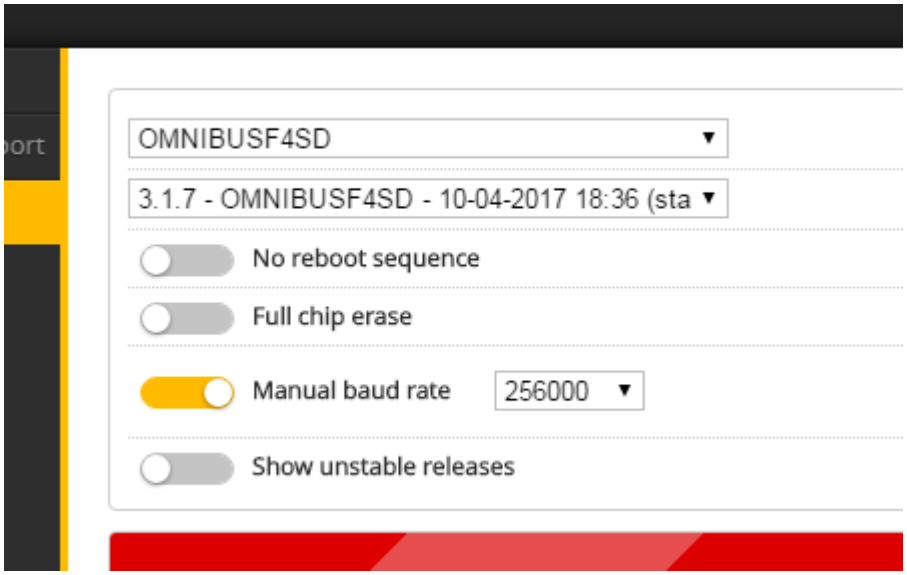
- Push BOOT button on the flight controller.
- Plug-in the USB cable (the red LED should not be as bright as normally).
- Fire up Zadig and hit “Options” and then “List All Devices”.
- From the list choose “STM32 BOOTLOADER”.
- Under “Driver” choose “WinUSB” on the right and hit “Reinstall Driver”.
- Close Zadig, disconnect the flight controller, close all Google Chrome instances.

More detailed tutorials are connected as follows:
https://www.dropbox.com/s/7rn0eagt4o5e4i7/how%20to%20%20install%20%20%20the%20%20DFU%20%20divice%20%20and%20%20no%20%20use%20%20the%20boot%20bottom.xls?dl=0

Schematic drawing software settings

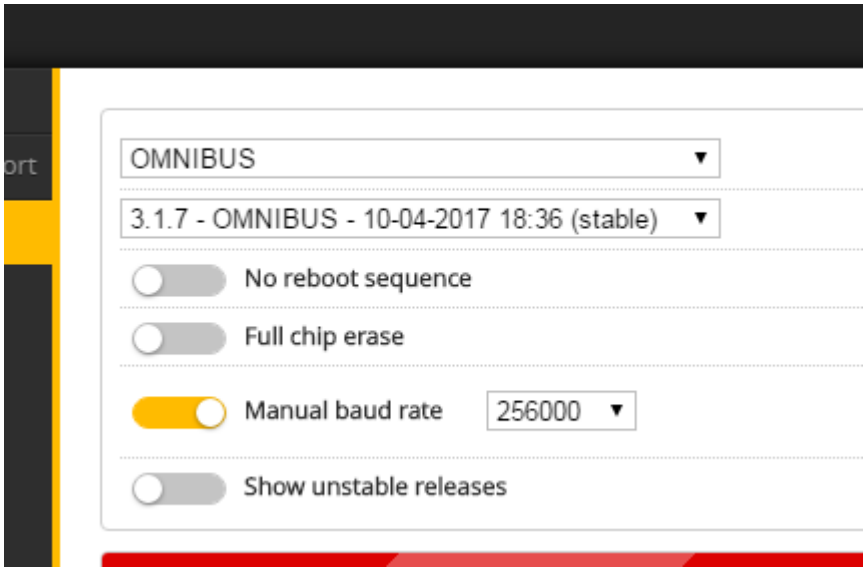
How to use and upgrade FC firmware

Flytower PRO F4 :



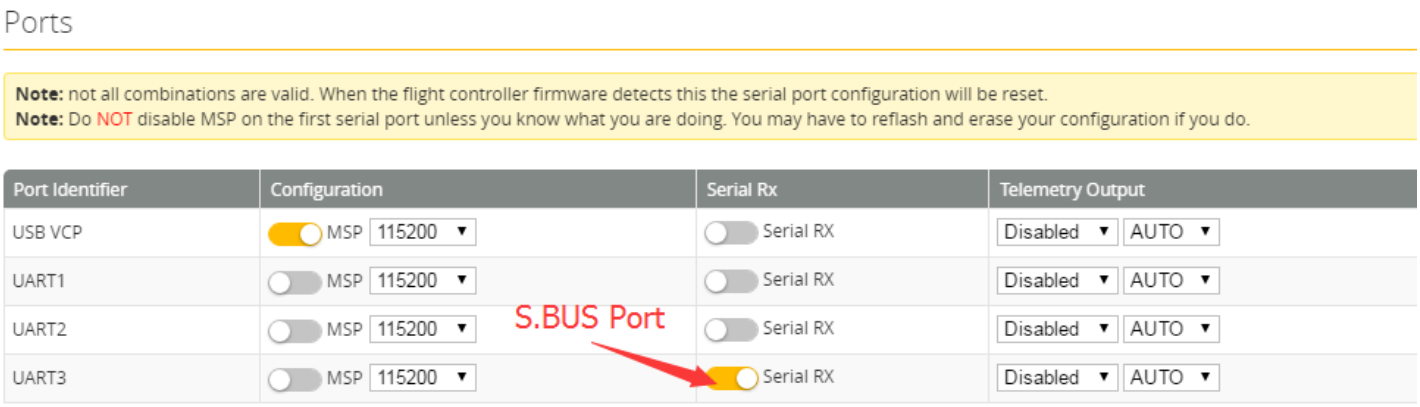
NOTE:Because the 3.1.7 version of the firmware of S.BUS function has some bugs , you have to wait for the 3.2 version of OMNIBUSF4SD to fix all of the problems, So we provide you with the default version to fix this bug of the firmware. The link as follow: https://www.dropbox.com/s/alyaq0wxyix6wit/Betaflight_3.1.7_OMNIBUSF4SD-PRO.hex?dl=0

Flytower PRO F3 :



How to set S.BUS/PPM/DSMX RC IN

Flytower PRO F3 :



Flytower PRO F4 :

Ports

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.
Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you

Port Identifier	Configuration	Serial Rx	Telemetry Output
USB VCP	MSP 115200	Serial RX	Disabled AUTO
UART1	MSP 115200	Serial RX	Disabled AUTO
UART3	MSP 115200	Serial RX	Disabled AUTO
UART6	MSP 115200	Serial RX	Disabled AUTO

S.BUS PORT

Receiver

Serial-based receiver (SPEKSAT, S ▾ Receiver Mode

Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX_SERIAL feature.

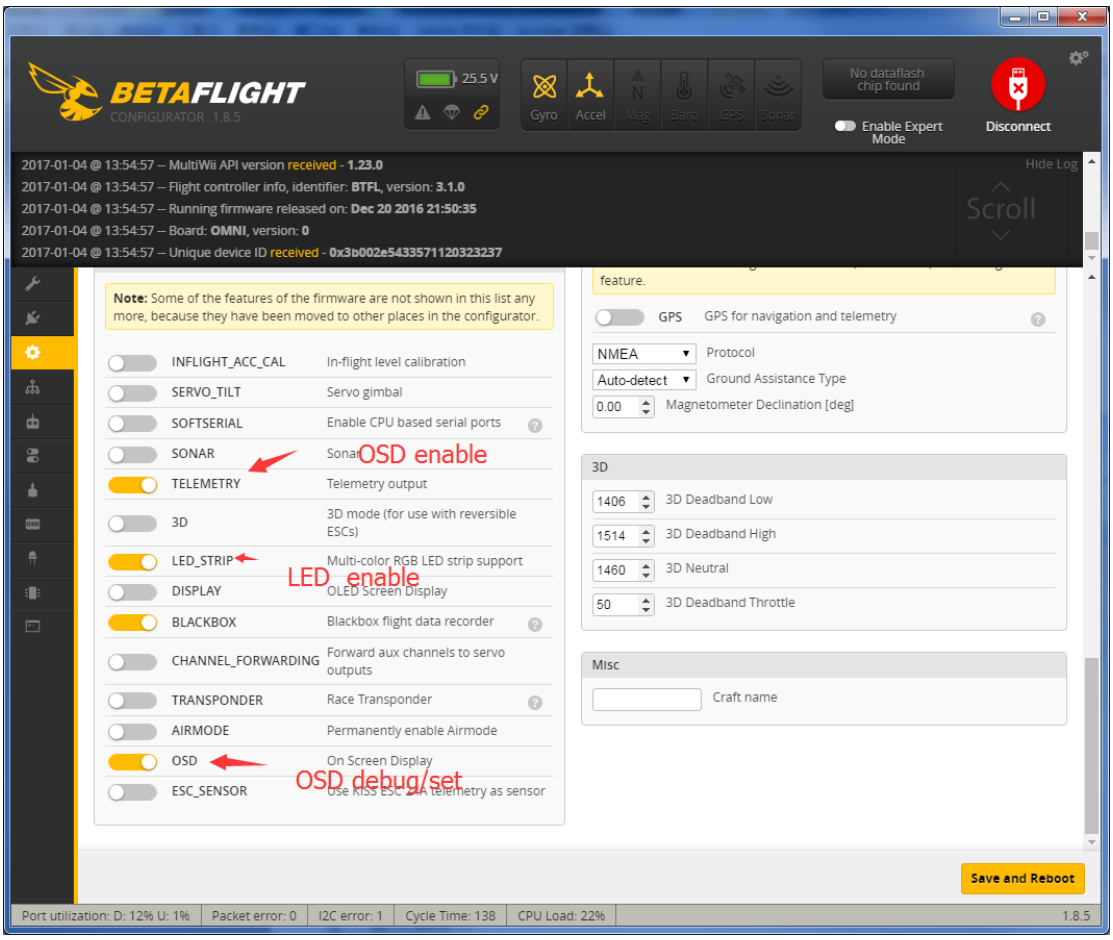
SBUS ▾ Serial Receiver Provider

RSSI (Signal Strength)

RSSI_ADC Analog RSSI input

System configuration

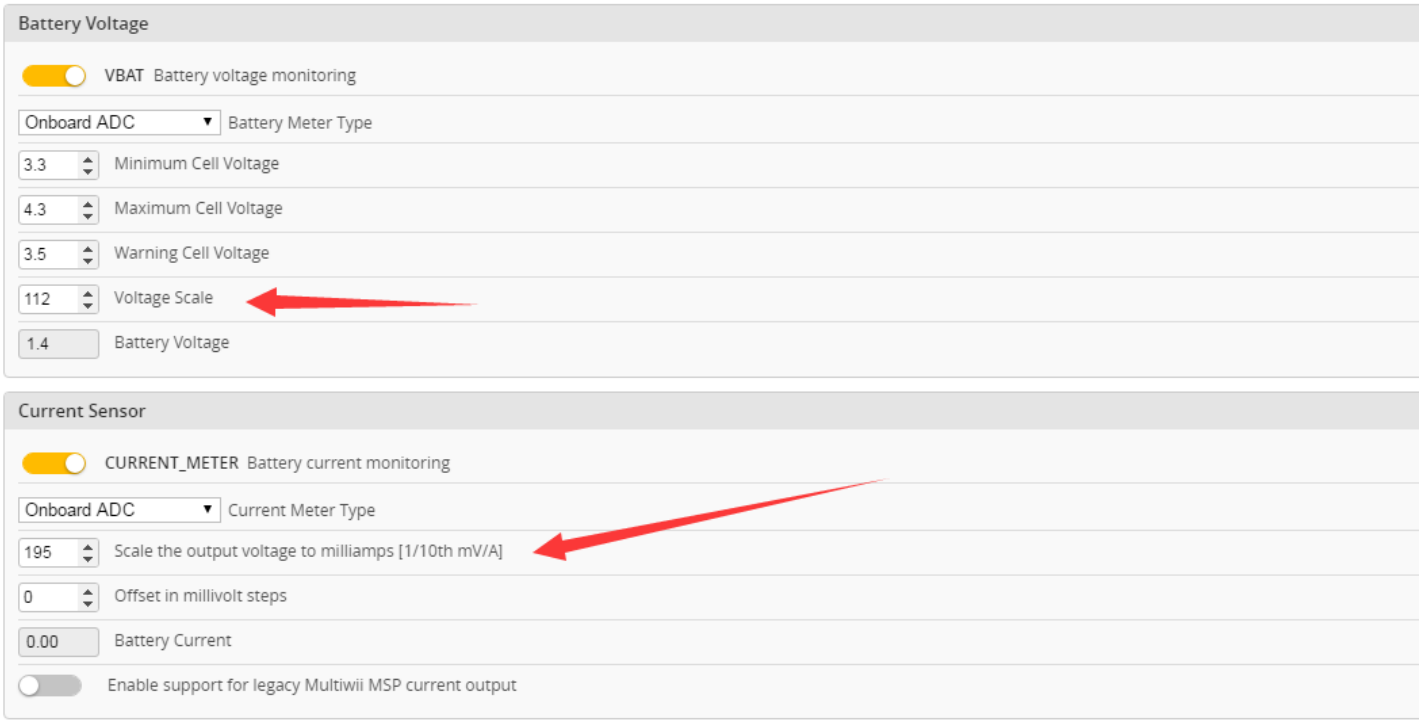
Note: Make sure your FC is capable to operate on these speeds! Check CPU and cycletime stability. Changing this may



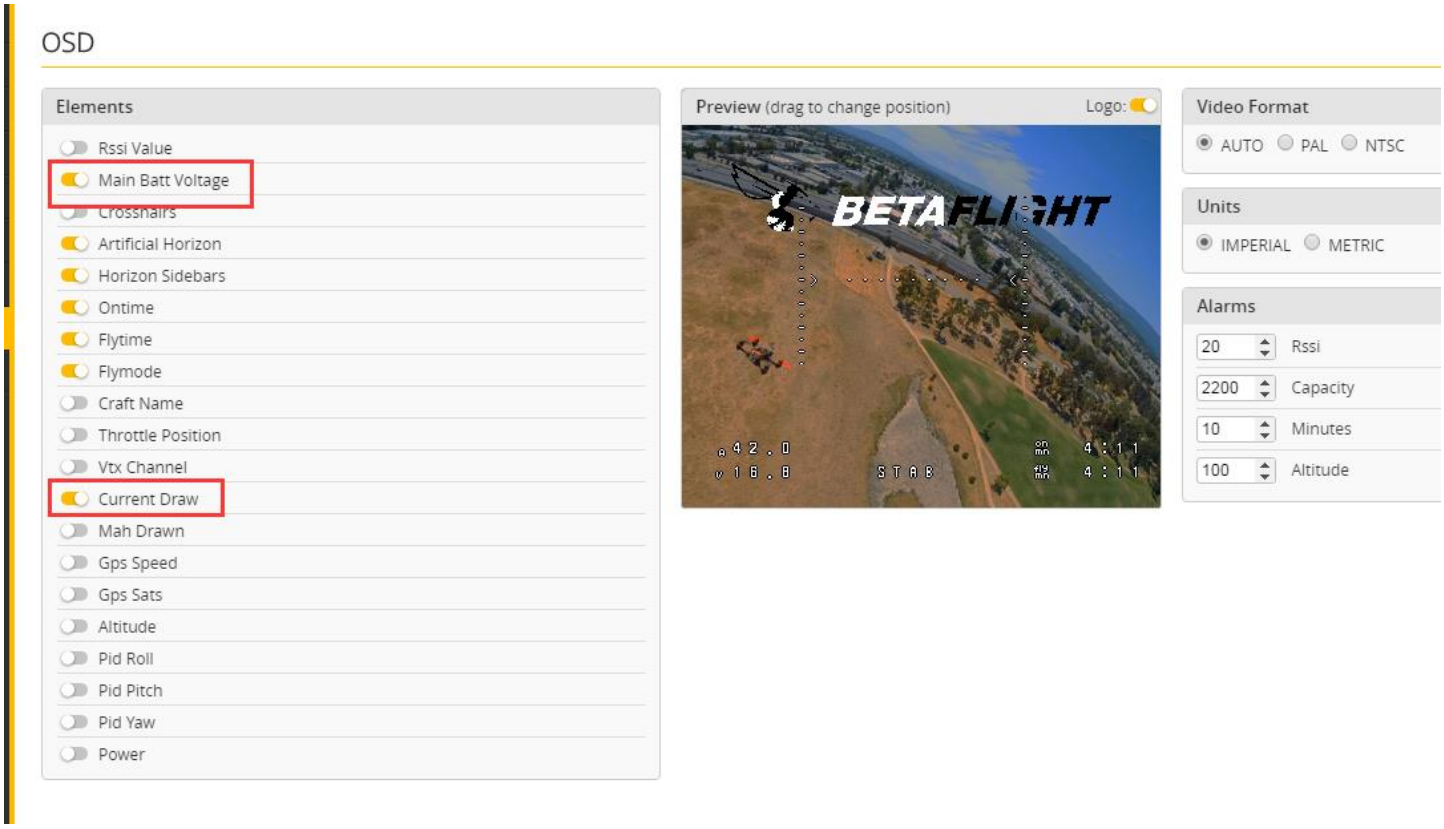
Voltage Sensor, Current sensor Calibration data:

Voltage data = 112;

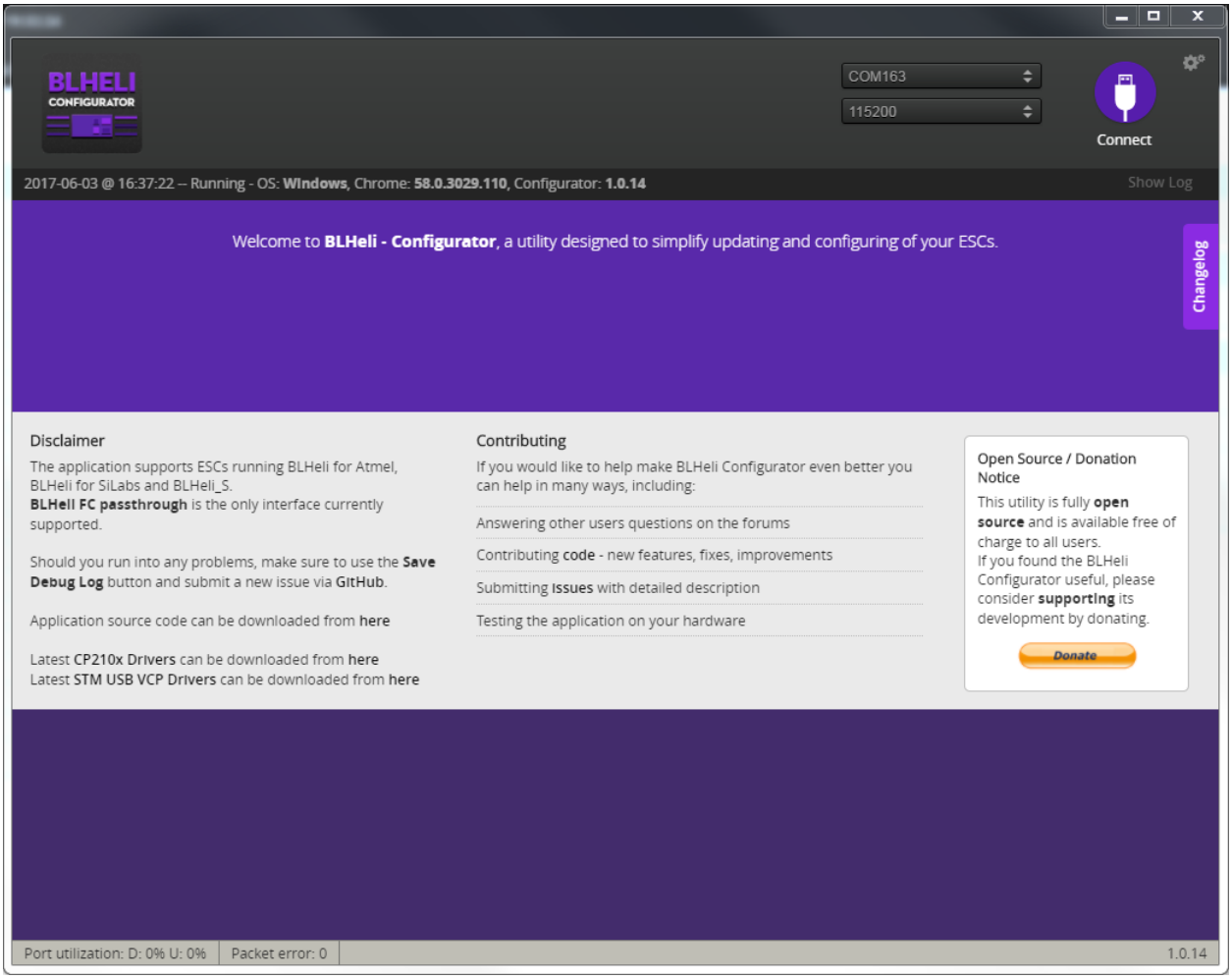
Current data = 195:



OSD setting and upgrade firmware



ESC use and upgrade firmware



1,Open

2,Choose a port and connect the battery to your drone

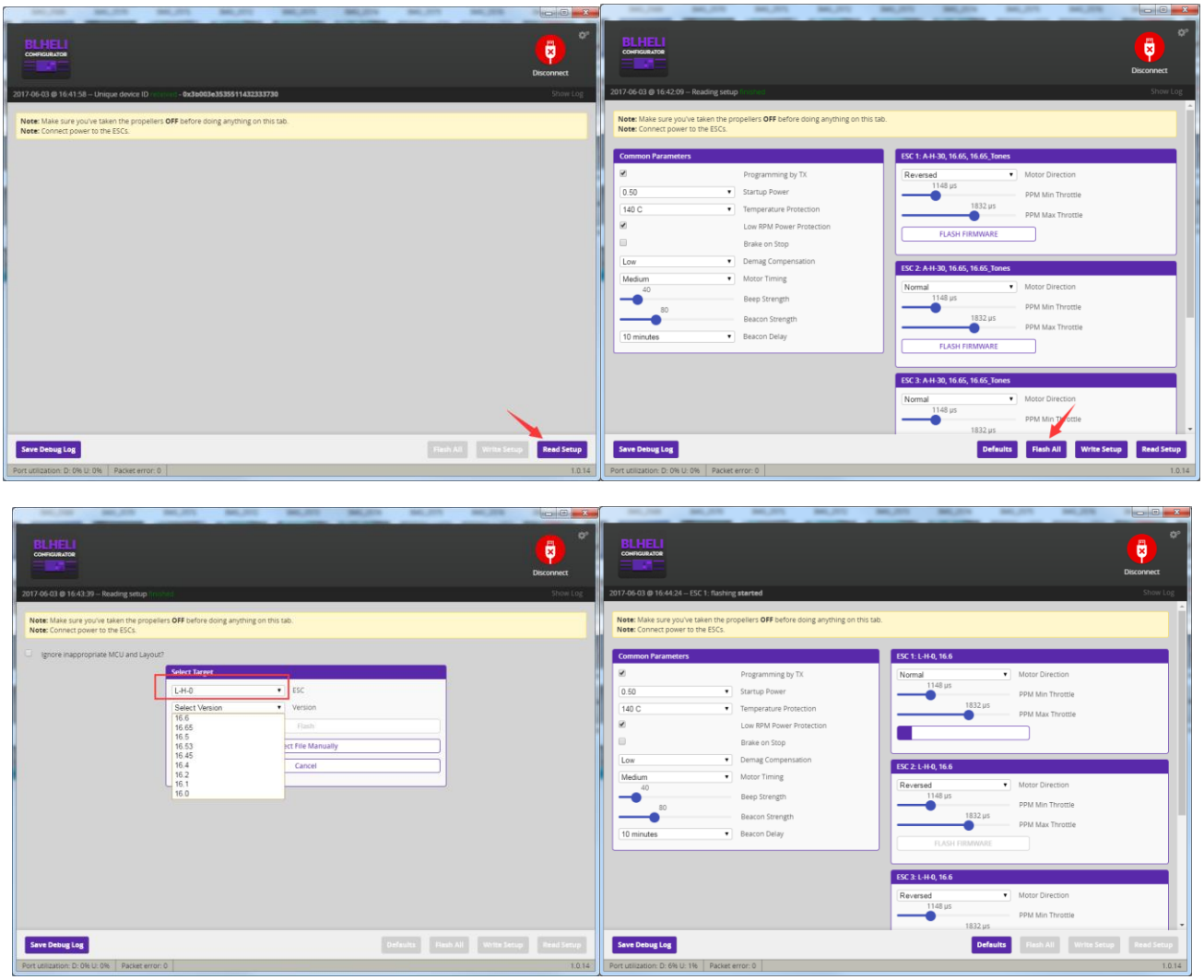
3,Connect USB cable to Flytower PRO FC Board

4,Click connect

5,Check ESC Information

6,Check Flash information

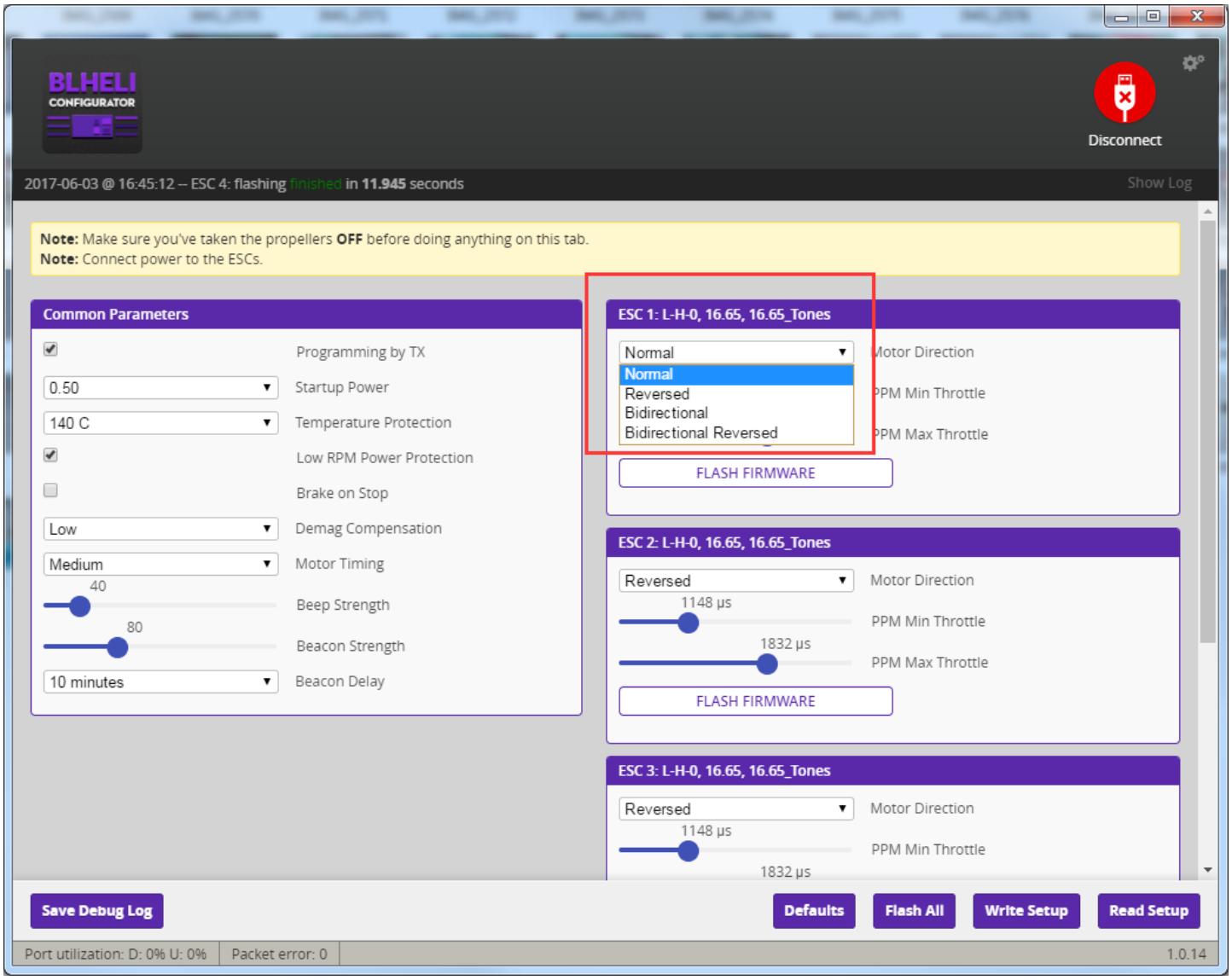
7,Check and flash the ESC firmware



Note:You have to flash original name firmware of the target(16.6(A_H_15/L_H_0).Do not try flash other versions of the firmware,So as not to damage the ESC.

Change the motor steering:

When the direction of the motor is not in the desired direction after soldering.The motor direction can be modified as follows:



1,Normal:keep the original direction unchanged.
2,Reversed:Modified in the opposite direction .
3,The other options please do not make changes!
4,Write setup .

How to use the VTX of Flytower PRO

1, Set the channel

In standby mode, press and hold the key for 3 seconds, the blue LED flashes, short press, change the channel value, add 1 on the current basis, followed by 1-8 cycles.

2, Set the Band

In the channel setting mode, press and hold the key for 3 seconds, the green LED flashes, briefly presses, changes the frequency group value, increments by 1 on the current basis, and then the A-F loop.

3, Set the Power

In the band setting mode, press and hold the key for 3 seconds, the red LED flashes, short press, change the output power value, increase 1 on the current basis, followed by 25mW / 200mW / 400mW cycle.

	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Band A	5865	5845	5825	5805	5785	5765	5745	5725
Band B	5733	5752	5771	5790	5809	5828	5847	5866
Band E	5705	5685	5665	5645	5885	5905	5925	5945
Band F	5740	5760	5780	5800	5820	5840	5860	5880
Band H	5362	5400	5436	5473	5510	5547	5584	5620
Band R	5658	5695	5732	5769	5806	5843	5880	5917

4, VTX LED display

BLUE: Frequency channel display, the number of flash represents 1-8 channels, 1 = CH1,2 = CH2, ... 8 = CH8.

GREE: Frequency Band display, the number of flashes represents the frequency group from A-R, 1 = A, 2 = B……6 = R

RED: Power output display, 1 = 25mW, 2 = 200mW, 3 = 400mW.

5, How to turn VTX on and off

In the working state, quickly double-click the set button, RED / GREEN / BLUE sync flash, VTX can be turned off, and also quickly double-click of the key to open the VTX output.