M8 Fresstyle HD drone and HDZERO AIO15 flight controller manual

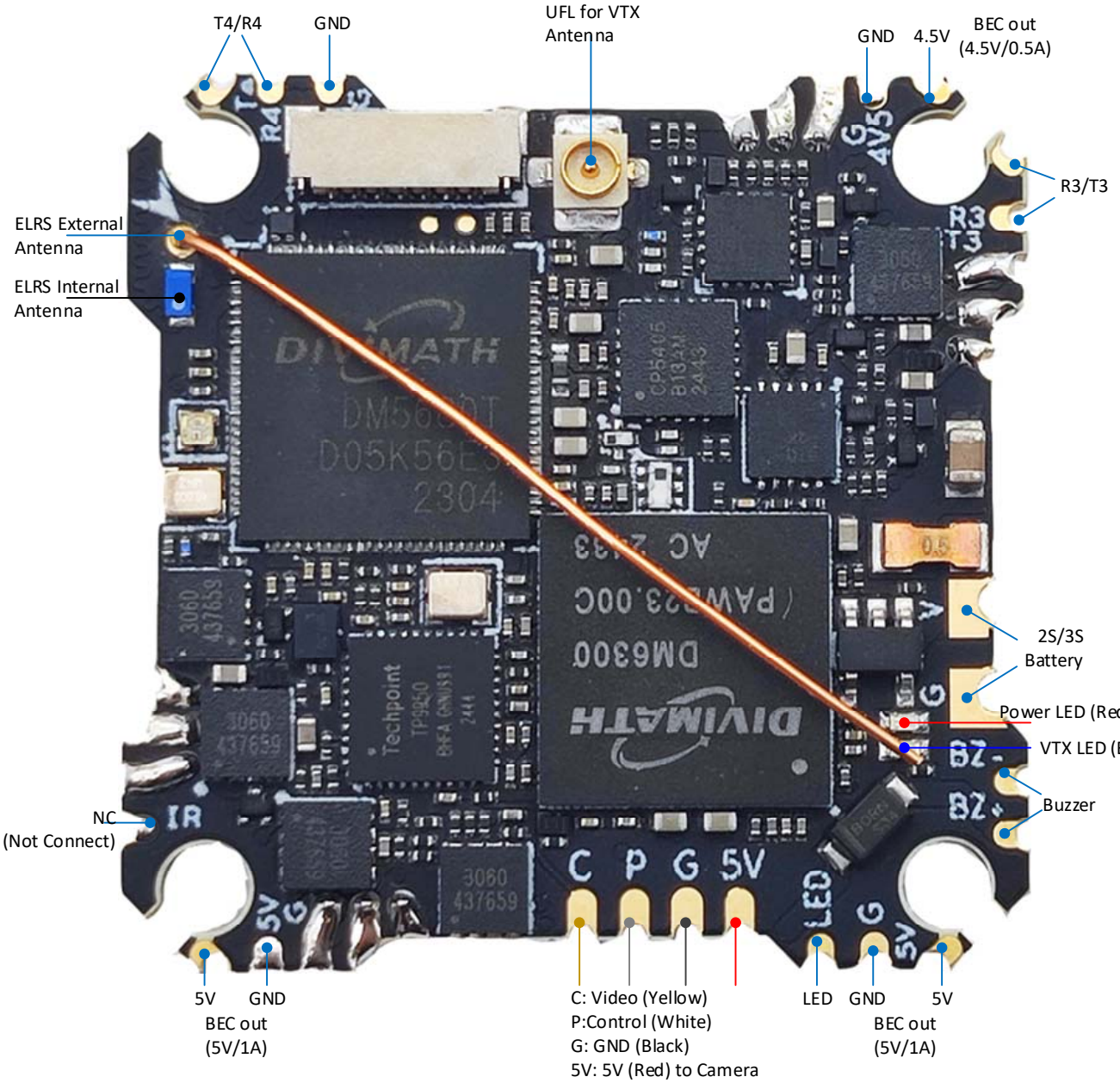
The M8 freestyle HD drone was preset and test with FPV flying , so you only need to bind to the drone and check correct mode switch after received.

Specifications

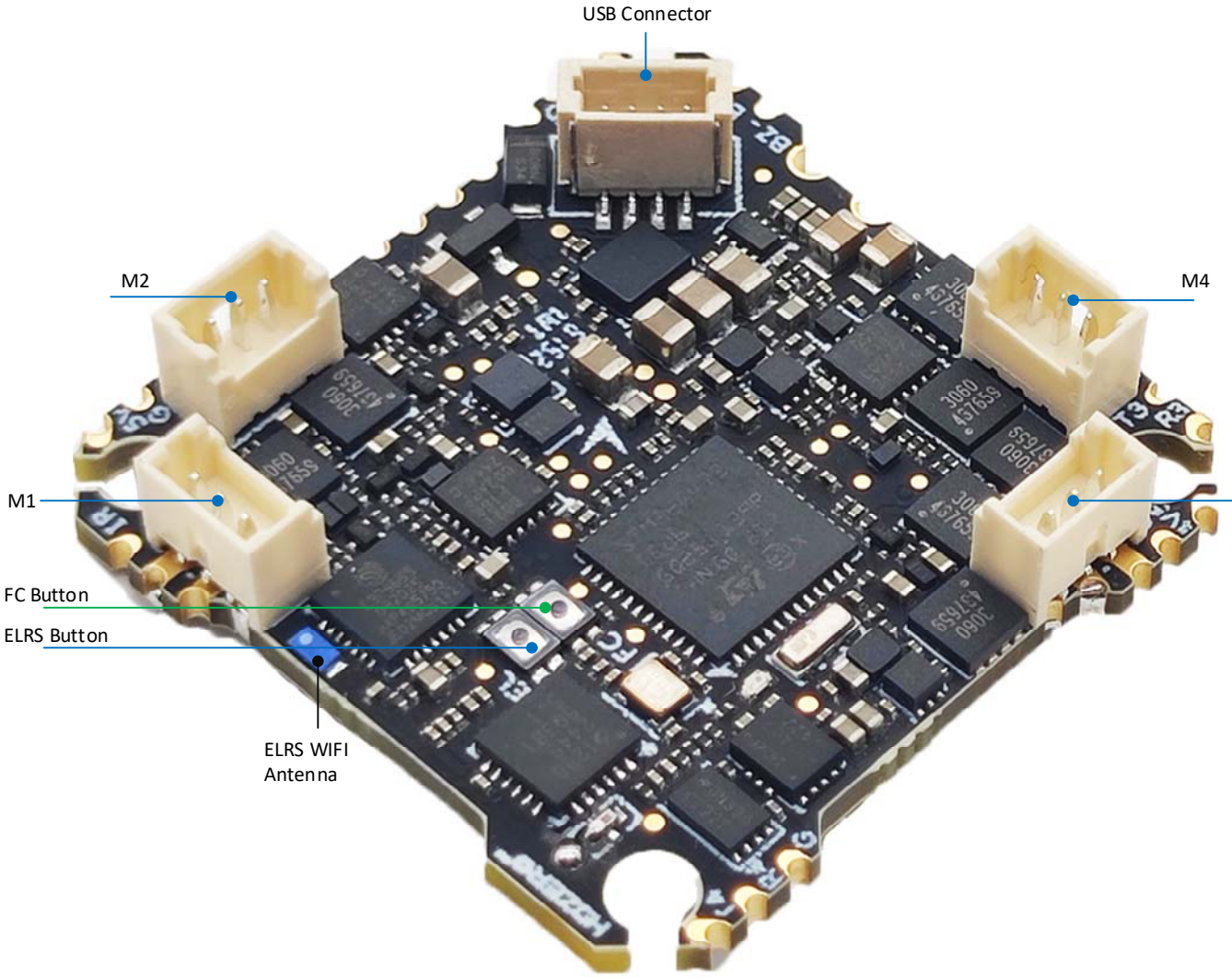
- MCU: STM32G473 (170MHz, 512K Flash)
- Gyro: ICM42688
- On board voltage and amperage meters
- Built-in 15A(each) BlueJay 4-in-1 ESC
    - MCU: EFM8BB21
    - HV Current: 15Ax4(continuous), 18Ax4(peak, 3 seconds)
    - Factory firmware: Z_H_30_48_v0.19.2.HEX
    - Dshot600 ready
- Built-in 5.8G HDZero VTX
    - RF output: 25mw/200mW
    - Supported channels: R1-R8, F2/F4, L1-L8
    - UFL connector (ultra-lite linear antenna included)
- Built-in Serial ExpressLRS 2.4GHz receiver
    - Packet rate option: 50/100/150/250/333/500/D250/D500/F500/F1000Hz
    - Pre-soldered enamel wire antenna
    - Telemetry output power: <12dBm
- Built-in 5V 3A BEC
- Flight controller firmware target: HDZERO_AIO15
- Power supply: 2S/3S battery (3.5V – 13V)
- Fully compatible with the popular whoop frames
    - Board size:31.3x31.3mm with a 25.5x25.5 mounting hole size
- Weight:7.2g (with motor plugs)

Diagram

TOP

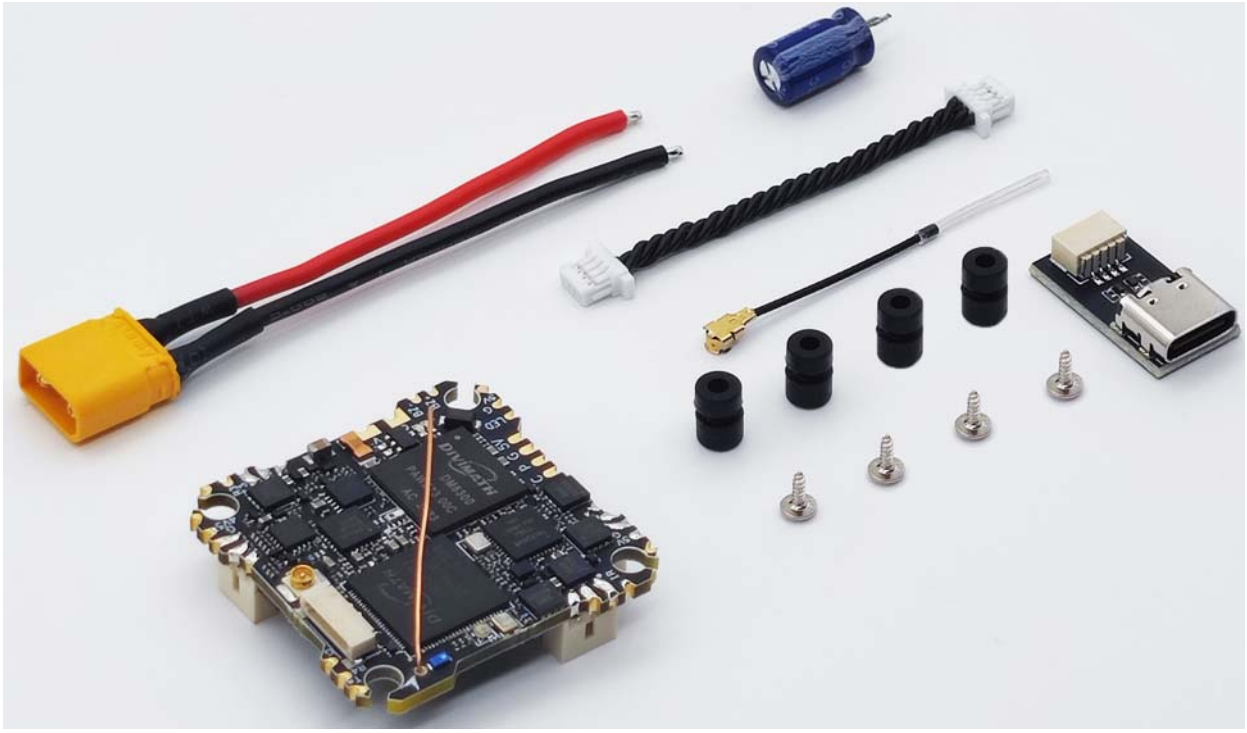

T4/R4
GND
UFL for VTX Antenna
GND
4.5V
BEC out (4.5V/0.5A)
R3/T3
ELRS External Antenna
ELRS Internal Antenna
2S/3S Battery
Power LED (Red
VTX LED (B
Buzzer
NC (Not Connect)
5V
GND
BEC out (5V/1A)
C: Video (Yellow)
P:Control (White)
G: GND (Black)
5V: 5V (Red) to Camera
LED
GND
5V
BEC out (5V/1A)

Bottom


USB Connector
M2
M4
M1
FC Button
ELRS Button
ELRS WIFI
Antenna

Included

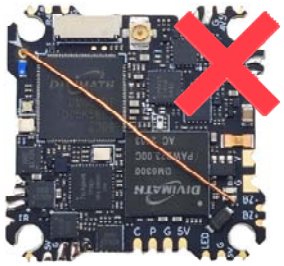
- 1x HDZero AIO15 board
- 1x Power cable with XT30 connector
- 4x screws
- 4x rubber grommets
- 1x ultra-lite linear VTX antenna
- 1x JST-USB convert board and its cable
- 1x Capacitor (25V/150uF)

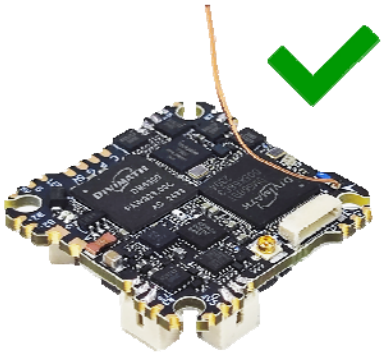


Installation Notes

ELRS antenna

A line antenna (¼ wavelength) for the ELRS receiver is pre-soldered and positioned close to the board for low-profile and easy packaging. However, **the ELRS antenna needs to be lifted to maintain at least 3 mm of clearance from the board.**

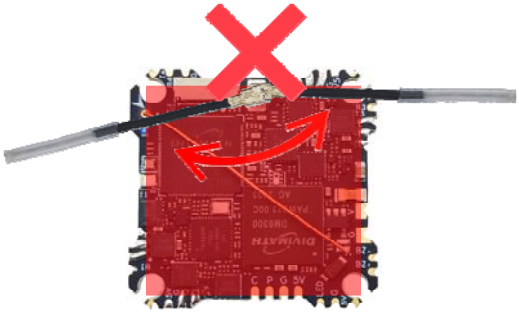


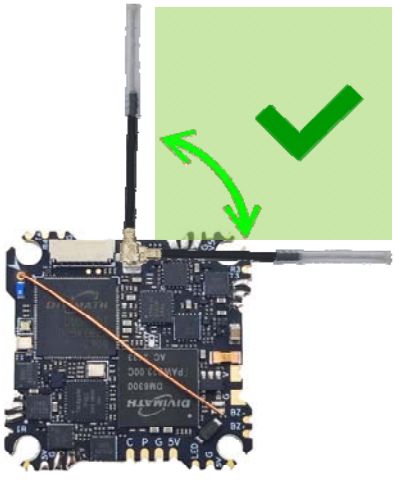


VTX antenna

The HDZero VTX integrated into the AIO5 has a specific requirement to prevent video noise caused by the video RF signal being routed back to the onboard power amplifier.

The VTX antenna should be mounted outward, not inward, on the board.





Bind with TX radio

There are two ways to configure AIO for binding:

1. Connect HDZero AIO15 to PC via micro-USB. Open Betaflight and connect to the AIO15. Navigate to the “Receiver” tab and click “Bind” to initiate binding mode; or
2. Power off the HDZero AIO15.

   Power-cycle the HDZero AIO15 3 times.
   - Supply power to the HDZero AIO15.
   - The ELRS LED lights up.
   - Turn it off within 2 seconds.
   - Repeat 2 more times.

   Once RX is in binding mode, insert the ELRS TX module into your OpenTX Radio transmitter, select External RF mode and set it to the CRSF protocol. You will find the ELRS menu in the Radio system (ensure the ELRS.LUA file is copied to the SD-Card tools first). Enter the ELRS menu and press [Bind]. The RX LED on the flight controller will become solid if the binding is successful.

   NOTE: Make sure you use the matching ELRS preset for your link rate, failure to do so can lead to un-commanded movement in turns.

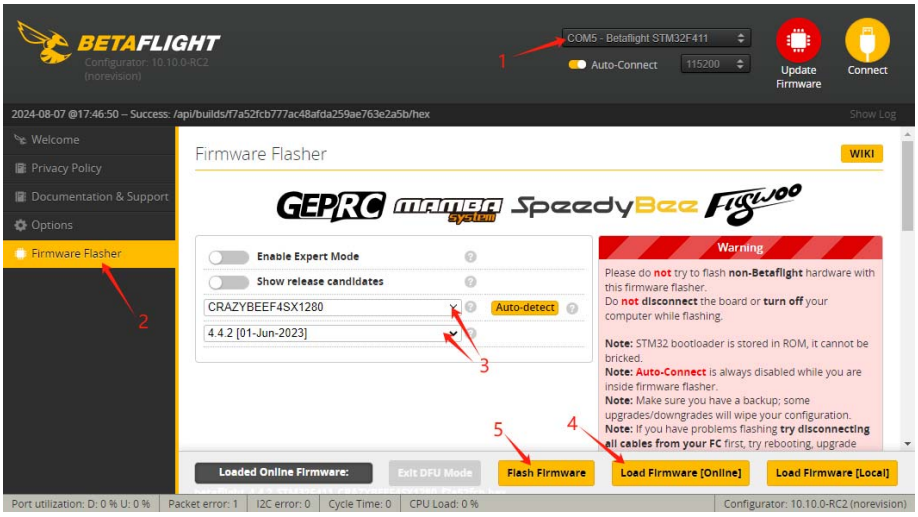
ELRS LED status:

- **Solid** means bind successful or Connection established;
- **Double-flash** means in bind mode;
- **Flash slowly** means no signal established with the TX module

Firmware

1. Betaflight firmware

- Download and install the Betaflight Configurator.
- Launch the Betaflight Configurator to flash firmware.

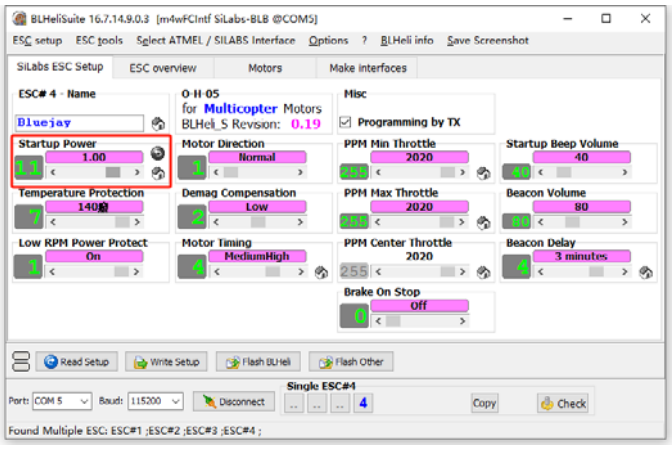


1. Select the target port
2. Click "Update Firmware" to enter Firmware Flasher tab
3. Select target "HDZero_AIO15" and version, The factory version is 4.4.2[01-Jun-2023]
4. Click "Load Firmware[Online] " to download the firmware
5. Click "Flash Firmware" to Flash the Flight controller

2. BlueJay ESC firmware

The factory firmware: Z_H_30_48_v0.19.2.HEX. To flash a new ESC firmware, here is a YouTube tutorial.

After flashing firmware, it is needed to set the Startup Power of each ESC to 1.00 through BLHeliSuite 16.7.14.9.0.3



Please note that heat dissipation and full charged battery are needed for flashing ESC firmware.

3. HDZero firmware

- Purchase a HDZero VTX Programmer if you don't have one;
- Download *HDZero Programmer* application from https://www.hd-zero.com/document

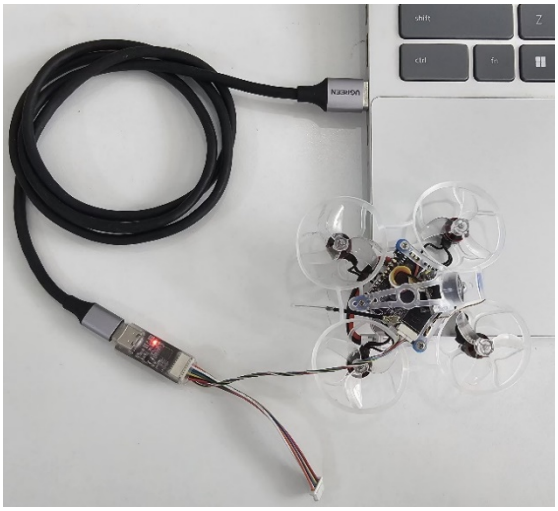
Utilities

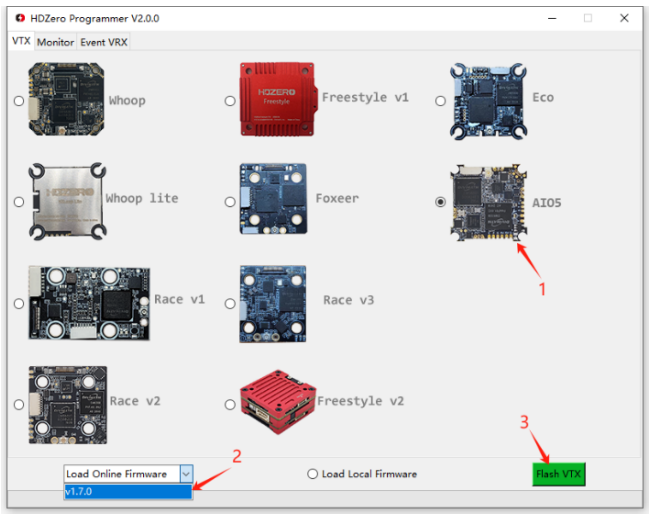
Utilities	Download	Note
Unlock_Lowband*	Unlock_Lowband.zip	Make sure your region allows low band before download.
HDZero Programmer	HDZero Programmer.zip	
Phoenix Card	PhoenixCard.zip	
VTX_Table	VTX_Table.zip	

- Plug the HDZero VTX Programmer into AIO15's VTX FW Connector. And use the USBC cable to connect the programmer tool and PC
- Launch the *HDZeroProgrammer.exe* on a Windows PC

1. Select the AIO15
2. Click "Load Online Firmware" and select the version number
3. Click "Flash VTX". "Connecting VTX ..." will be displayed at the bottom

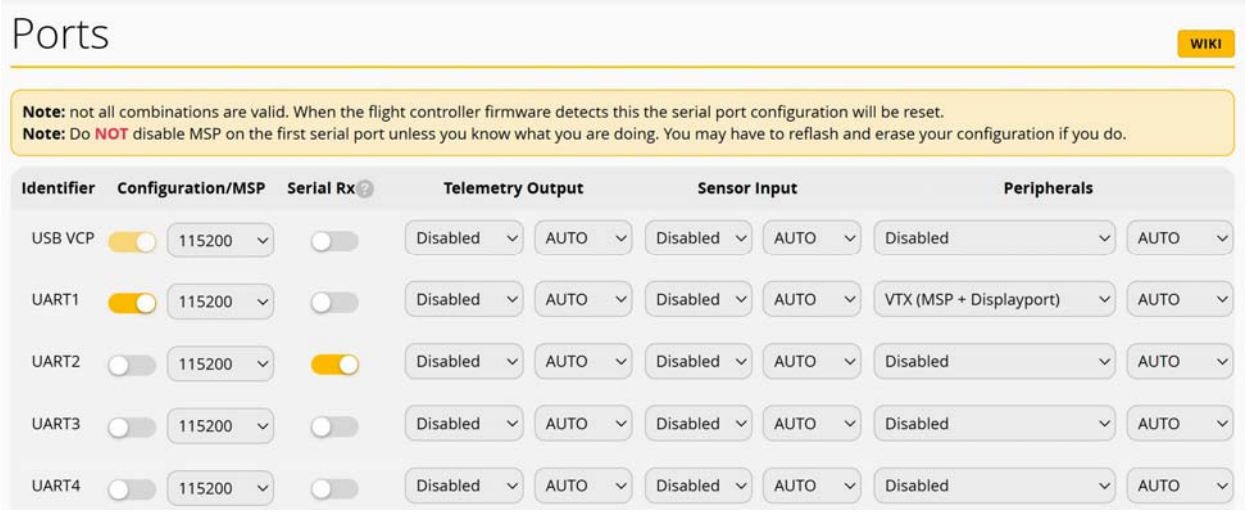
The application will automatically

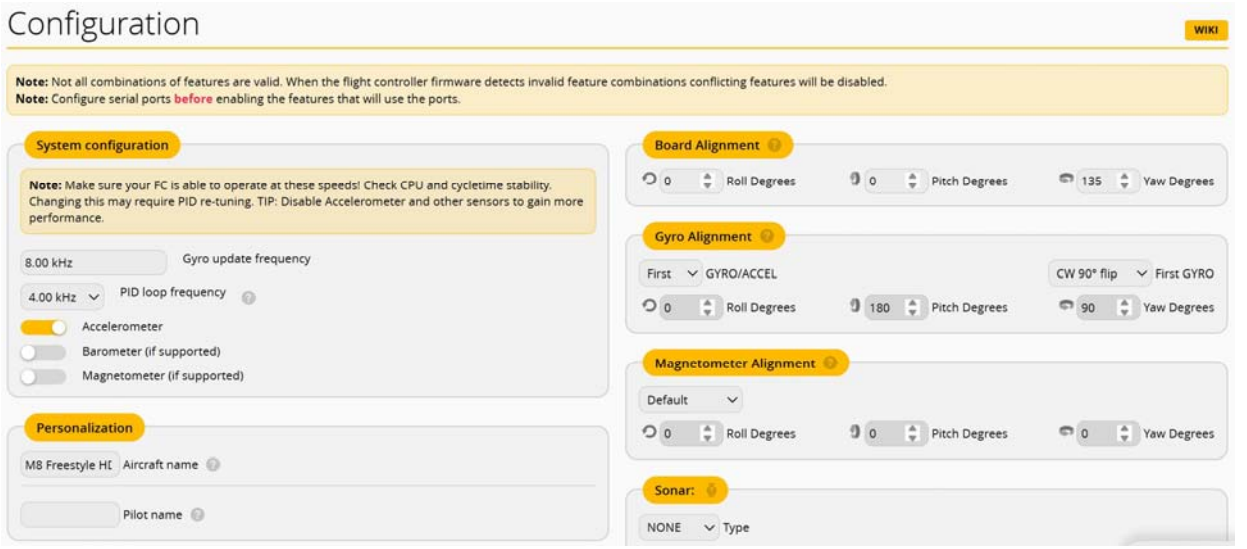


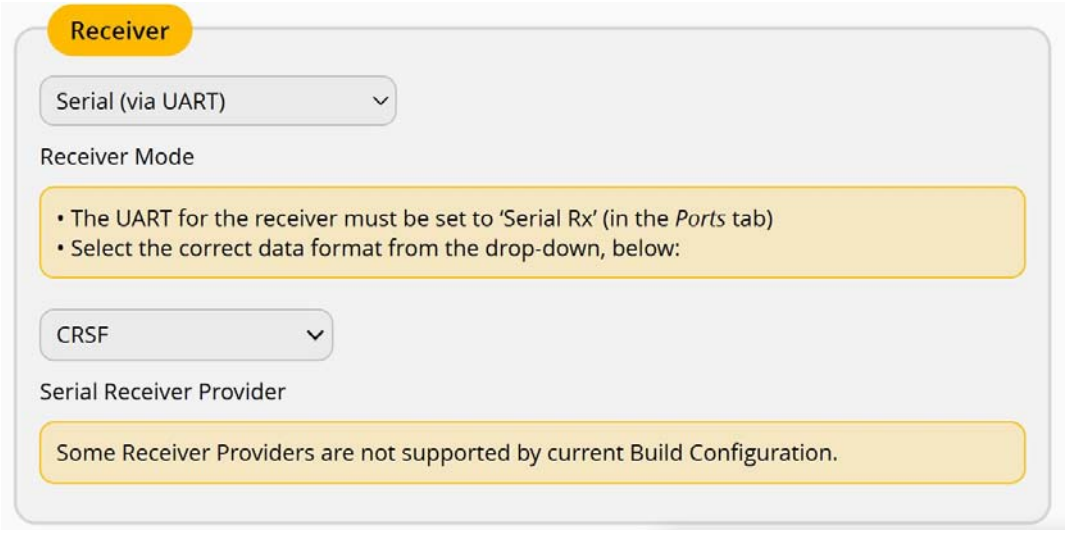


download the firmware and flash it.

M8 Freestyle HD betaflight configurator settings:



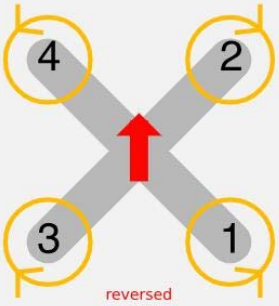




Mixer

QUAD X

Motor direction is reversed



Reorder motors **Motor direction**

ESC/Motor Features

DSHOT300 ESC/Motor protocol

MOTOR_STOP Don't spin the motors when armed

ESC_SENSOR Use KISS/BLHeli_32 ESC telemetry **over a separate wire**

Bidirectional DShot (requires supported ESC firmware)

12 Motor poles (number of magnets on the motor bell)

8.5 Motor Idle (%)

0 Dynamic Idle Value [* 100 RPM]