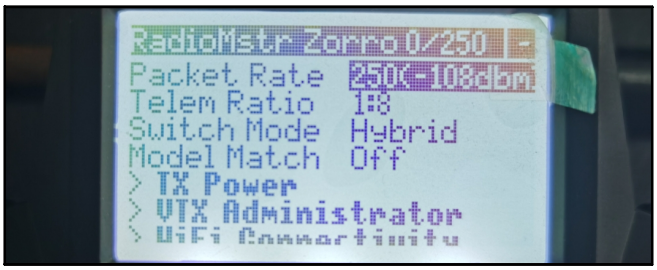
| Features |
|---|
| Digital HD FPV experience |
| New CrazyF405 ELRS HD flight controller |
| Powerful and Smooth |
| UART ExpressLRS receiver |
| Built-in blackbox for Gyroflow and PID Tune |
| Battery tray size: Maximum support for batteries with a width of approximately 17mm and a height of approximately 13mm |

| Specifications |
|---|
| Brand Name: Happymodel |
| Item Name: Mobula8 2S 85mm Digital HD Micro FPV whoop built-in Walksnail or HDZERO VTX |
| Wheelbase: 85mm |
| Size: 120mm*120mm*48mm |
| Weight: HDZERO version 46.5gram<br>Walksnail version 48gram |

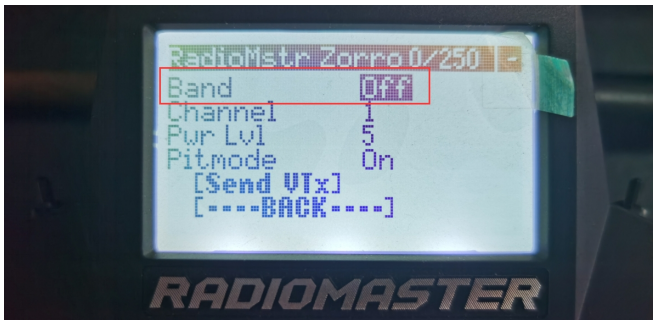
| Package Includes | |
|---|---|
| Item Name | Qty |
| Mobula8 Frame | 1 |
| CrazyF4HD ELRS flight controller firmware target:BETAFLIGHTF4 | 1 |
| EX1103 KV11000 brushless motor | 4 |
| Gemfan Hurricane 2023 tri-blade propellers(4cw+4ccw) | 1 |
| Option1: Walksnail avatar HD Mini 1S lite kit | 1 |
| Option2: HDZERO Whoop Lite bundle | |
| Canopy | 1 |
| Screw driver | 1 |

## Bind Procedure

1) Supply power to the flight controller by plug USB, wait until the Red LED on the FC is off, immediately turn off the power, and then repeat again the above steps. When the FC is powered on for the third time, the Red LED light will start to double-flash, which means that the RX enters the binding mode
2) Please make sure your ExpressLRS tx module firmware is v3.x.x. And go to ExpressLRS.lua from “TOOLS” menu of your radio transmitter. Then hit [Bind] to binding with the onboard ExpressLRS receiver. The Red LED should blinking slowly first then turn to solid, that means binding was successfully. If the red LED got triple blinking and no rx input from receiver tab ,please change Model Match tab value from “off” to “on” or from “on” to “off”, then change back to "off", that would working normal.

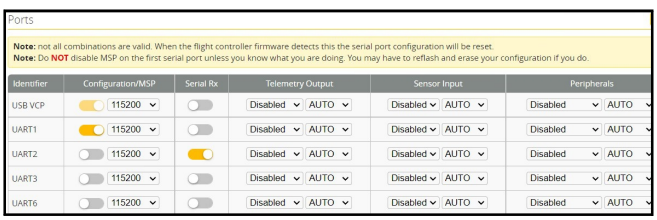


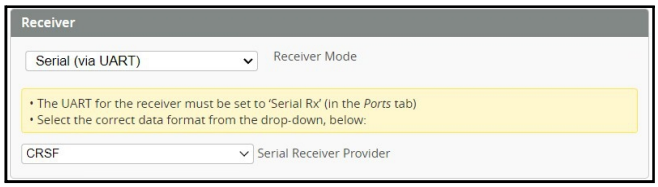

3) Check the receiver channel map and channel value is correct after bind successful.




Make sure the VTX band is "OFF" from the vtx administrator, sometimes it would affect VTX .

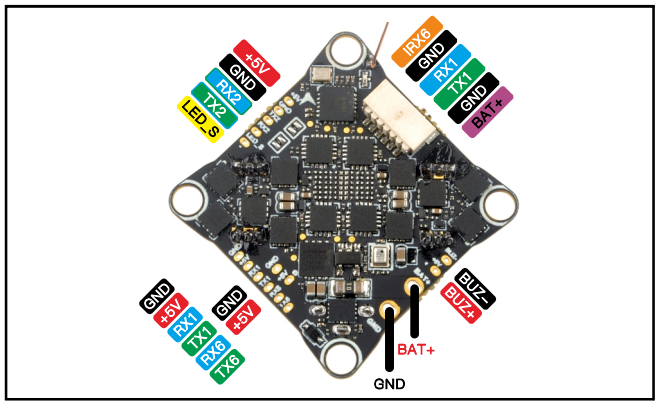
## Port and Receiver settings

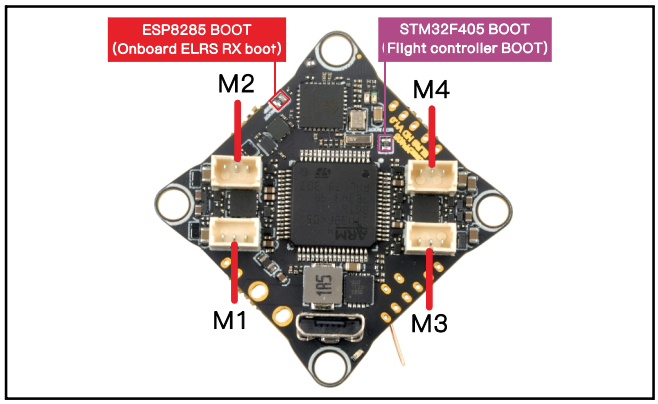


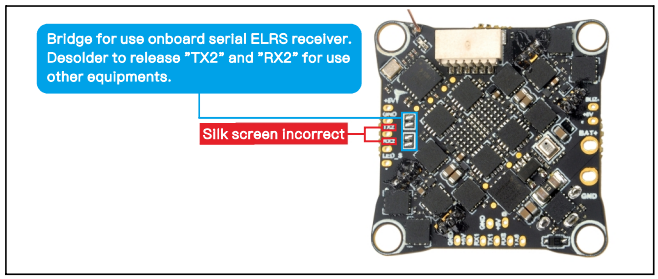



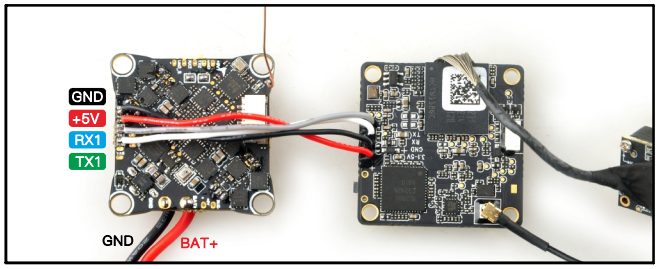

***OSD display command for Walksnail UART ELRS version if you re-flashed firmware:
set osd_displayport_device = MSP
set displayport_msp_serial = 0
save
***If you upgrade firmware to 4.4.x , then you should enable MSP for uart1 and VTX(MSP+Displayport) from Port setting of the betaflight configurator


## Flight controller connection diagram



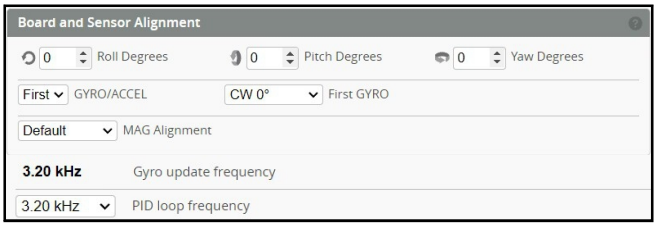



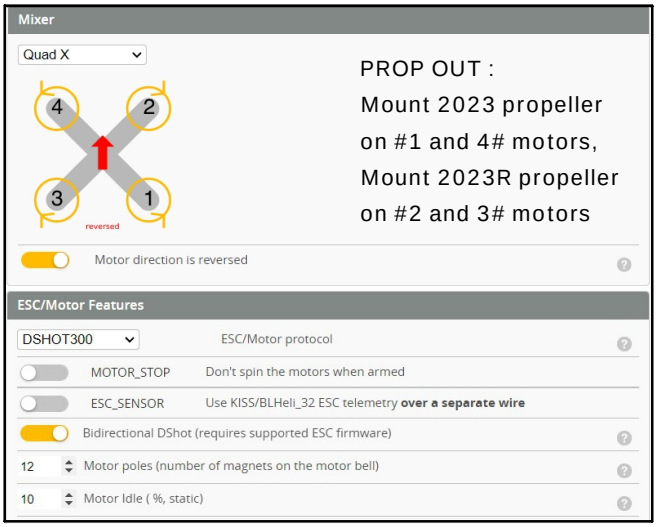

## Arm/Disarm the Motor

1)For Walksnail version ,please first link the VTX with goggles and match the channels
2)Turn on your radio transmitter and connect the battery to the Mobula8 HD Walksnail .Then place Mobula8 HD horizontally on the ground.
3)Toggle Aux1 switch to arm the motors, the Green LED at the bottom of the flight controller would get solid once armed, happy flying.

## Board and sensor alignment and frequency settings



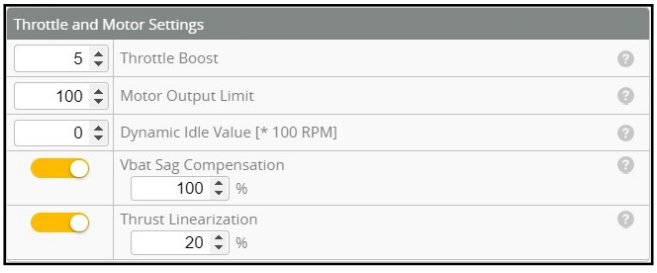

## Motors and ESC settings

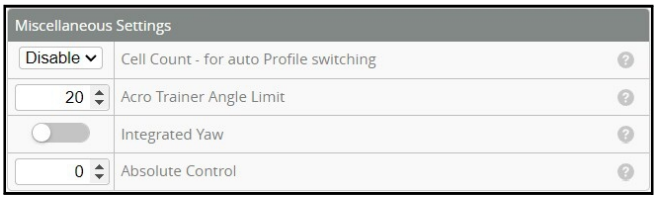


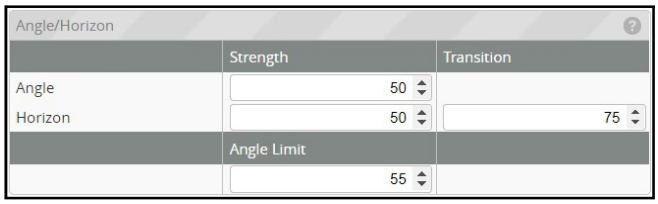

## Default PID and Filter Settings

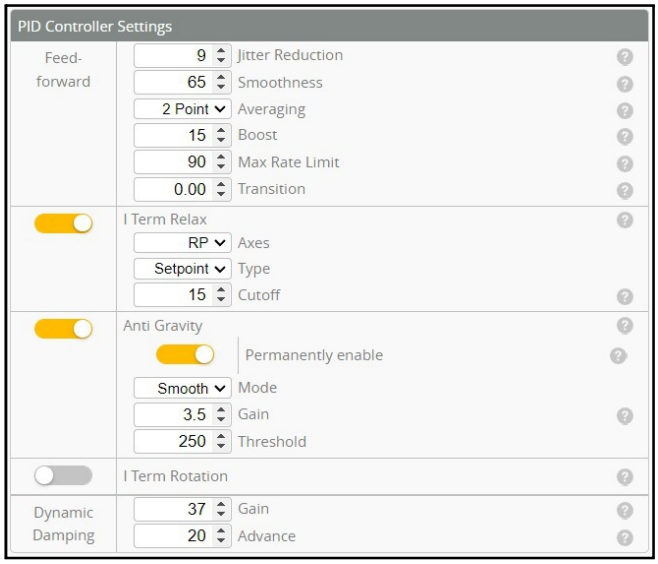
| | Proportional | Integral | D Max | Derivative | Feedforward |
|---|---|---|---|---|---|
| Basic/Acro | | | | | |
| ROLL | 59 | 95 | 46 | 34 | 0 |
| PITCH | 62 | 99 | 55 | 41 | 0 |
| YAW | 59 | 95 | 0 | 0 | 0 |

| Mode: RPY | | Low | Default | High |
|---|---|---|---|---|
| Damping: *D Gains* | 1 | | | |
| Tracking: *P & I Gains* | 1.15 | | | |
| Stick Response: *FF Gains* | 0 | | | |
| Dynamic Damping: *D Max* | 1 | | | |
| Drift - Wobble: *I Gains* | 0.9 | | | |
| Pitch Damping: *Pitch:Roll D* | 1.05 | | | |
| Pitch Tracking: *Pitch:Roll P, I & FF* | 1 | | | |
| Master Multiplier: | 1.15 | | | |

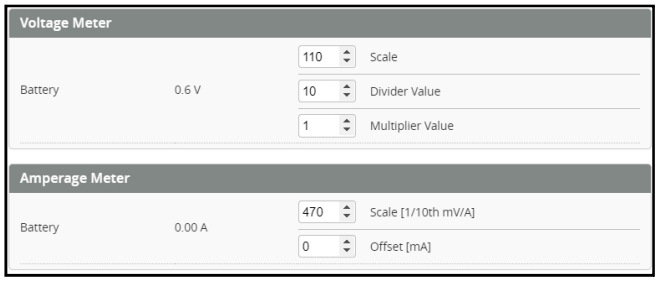


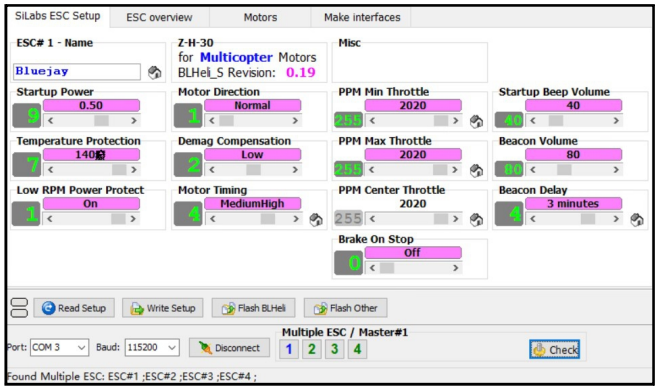




## Voltage and Currents meter settings

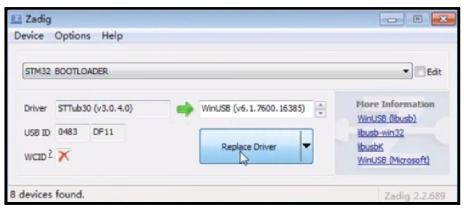



## ESC Settings




## Flight controller firmware update

1.Install latest STM32 Virtual COM Port Driver
http://www.st.com/web/en/catalog/tools/PF257938
2.Install STM BOOTLOAD Driver (STM Device in DFU MODE)
3.Open Betaflight configurator and choose firmware target "BetaflightF4",then select the firmware version.
4.There are 2 ways to get in DFU Mode: 1). solder the boot pad and then plug USB to computer 2).loading betaflight firmware and hit "flash", then it will getting into DFU Mode automatically.
5.Open Zadig tools to replace the drivers from STM32 Bootloader to WINUSB Driver.
6.Reconnect the flight controller to the computer after replace driver done , and open Betaflight Configurator, loading firmware and flash.




Firmware and dump file

Firmware and diff download