

Features
HD Digital VTX system available
Walksnail HD or HDZERO optional
SPI ELRS or UART ELRS optional
Powerful EX1103 KV11000 motors
Recommend 2S 450mah/550mah/650mah battery (Not include)
Battery tray size: Maximum support for batteries with a width of approximately 17mm and a height of approximately 13mm

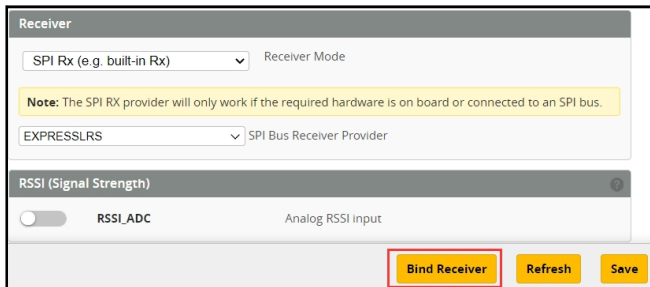
Specifications
Brand Name: Happymodel
Item Name: Bassline Digital HD 2S toothpick FPV drone built-in Walksnail or HDZERO VTX
Wheelbase: 90mm
Size: 115mm*115mm*40mm
Weight: 46gram

Package includes	
Item Name	Qty
Bassline 2inch frame and canopy	1
Flight controller Option1: X12 Lite V1.0 flight controller built-in SPI ELRS 2.4G receiver	1
Flight controller Option2: CrazyF411 ELRS built-in UART ELRS 2.4G receiver	
EX1103 KV11000 brushless motor	4
Gemfan toothpick 2023 tri-blade propellers(4cw+4ccw)	1
Walksnail Avatar HD mini 1s lite kit	1
HDZero Whoop Lite and nano lite bundle	
Canopy for 14mmx14mm camera	1
Screw driver	1
USB adapter	1

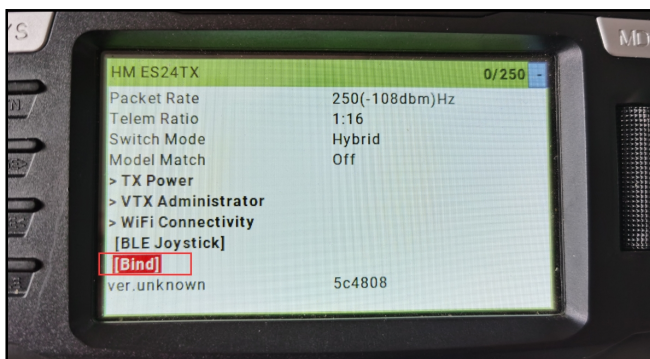
**BIND PROCEDURE**

\*The default Bassline HDZERO SPI ELRS version support ExpressLRS 2.x.x version TX module.If your TX module already upgrade to v3.x.x , then need to download new flight controller firmware and flash from this link <https://bit.ly/3VzKNT>

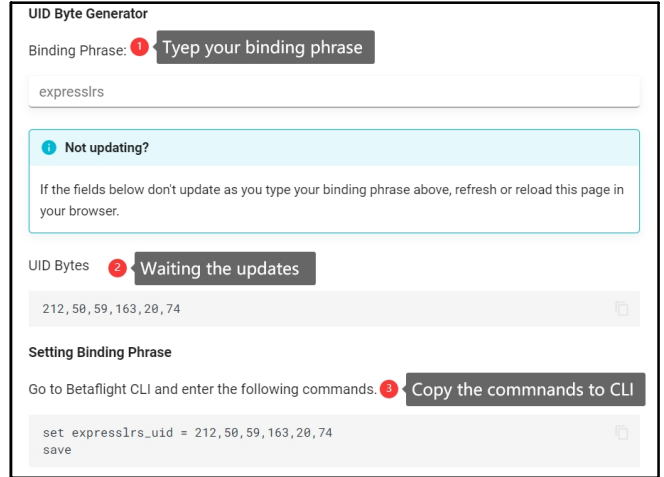
1). Connect Bassline HDZERO SPI ELRS with computer by Plug USB. Running Betaflight configurator and then move on Receiver tab then hit "Bind Receiver". The Red LED on the flight controller start blinking fast, it means onboard SPI ELRS receiver is in bind mode.



2). Turn on your radio transmitter and running ELRS.LUA v2 version, scroll down the menu and hit [Bind]. The Red LED on the flight controller would get solid first and then start to blinking slowly. It means bind successfully. Re-connect the USB and then you will find link was established.



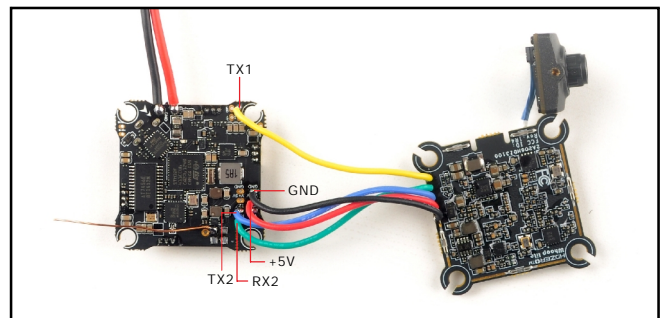
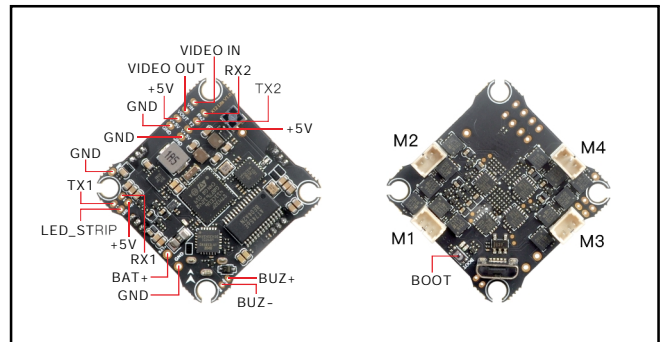
Use your own binding phrase to bind with your TX module  
 Visit <http://bit.ly/3Q6HIKB>  
 and use UID Byte Generator



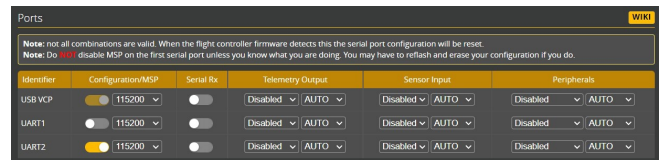
**ARM/DISARM THE MOTOR**

- 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 Bassline HD Walksnail or HDZERO. Then place Bassline 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.

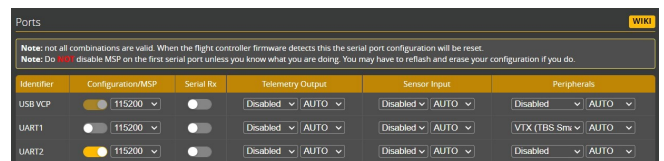
**FLIGHT CONTROLLER CONNECTION DIAGRAM**



Bassline HDZERO SPI ELRS version port setting



Bassline HDZERO SPI ELRS version port setting



\*\*\*OSD display command for both Walksnail and HDZERO version if you re-flashed firmware:  
 set osd\_displayport\_device = MSP  
 set displayport\_msp\_serial = 1  
 save

**BOARD AND SENSOR ALIGNMENT AND FREQUENCY SETTINGS**

Board and Sensor Alignment

Roll Degrees: 0 Pitch Degrees: 0 Yaw Degrees: 0

First: GYRO/ACCEL CW 90° First GYRO

Default MAG Alignment

8.00 kHz Gyro update frequency

2.00 kHz PID loop frequency

**We highly recommend 2.0kHz for the pid loop frequency for a better experience.**

**MOTORS AND ESC SETTINGS**

Mixer: Quad X

PROP OUT :  
Mount 2023 propeller on #1 and #4 motors,  
Mount 2023R propeller on #2 and #3 motors

Motor direction is reversed

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)

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

Motor Idle (% , static): 12

**DEFAULT PID AND FILTER SETTINGS**

	Proportional	Integral	D Max	Derivative	Feedforward
Basic/Acro					
ROLL	45	92	33	33	150
PITCH	47	96	33	33	156
YAW	45	92	0	0	150

Mode:	RPY	Low	Default	High
Damping: D Gains	1.1			
Tracking: P & I Gains	1			
Stick Response: FF Gains	1.25			
Dynamic Damping: D Max	0			
Drift - Wobble: I Gains	1.15			
Pitch Damping: Pitch:Roll D	0.9			
Pitch Tracking: Pitch:Roll P, I & FF	1			
Master Multiplier:	1			

Throttle and Motor Settings

Throttle Boost: 5

Motor Output Limit: 100

Dynamic Idle Value [\* 100 RPM]: 0

Vbat Sag Compensation: 100%

Thrust Linearization: Off

Miscellaneous Settings

Cell Count - for auto Profile switching: Disable

Acro Trainer Angle Limit: 20

Integrated Yaw: Off

Absolute Control: 0

Angle/Horizon

	Strength	Transition
Angle	50	
Horizon	50	75
Angle Limit	55	

PID Controller Settings

Feed-forward: 5 Jitter Reduction

Smoothness: 25

Averaging: OFF

Boost: 18

Max Rate Limit: 95

Transition: 0.00

I Term Relax: RP

Setpoint Type: 20

Cutoff: 20

Anti Gravity: Permanently enable

Mode: Smooth

Gain: 4.5

Threshold: 250

I Term Rotation: Off

Dynamic Damping: 37 Gain

Advance: 0

**VOLTAGE AND CURRENTS METER SETTINGS**

Voltage Meter

Battery: 0.6 V

Scale: 110

Divider Value: 10

Multiplier Value: 1

Amperage Meter

Battery: 0.00 A

Scale [1/10th mW/A]: 470

Offset [mA]: 0

**ESC SETTINGS**

SILabs ESC Setup

ESC# 1 - Name: Bluejay

Z-H 30 for Multicopter Motors

BLHeli\_5 Revision: 0.16

Misc: Programming by TX

Startup Power: 0.50

Motor Direction: Reversed

PPM Min Throttle: 2020

Startup Beep Volume: 40

Temperature Protection: 140

Demag Compensation: Low

PPM Max Throttle: 2020

Beacon Volume: 80

Low RPM Power Protect: On

Motor Timing: MediumHigh

PPM Center Throttle: 2020

Beacon Delay: 3 minutes

Brake On Stop: Off

Port: COM 3 Baud: 115200

**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 "CRAZYBEE F4SX1280", 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 diff download