

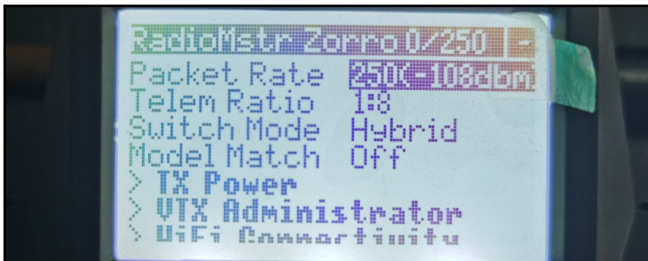
Features
HD Digital VTX system available
Walksnail HD or HDZERO optional
SPI ELRS or UART ELRS optional
Powerful EX1103 KV11000 motors
Recommend 2S 450mah/550mah/650mah battery (Not include)
Battery tray size: Maximum support for batteries with a width of approximately 17mm and a height of approximately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

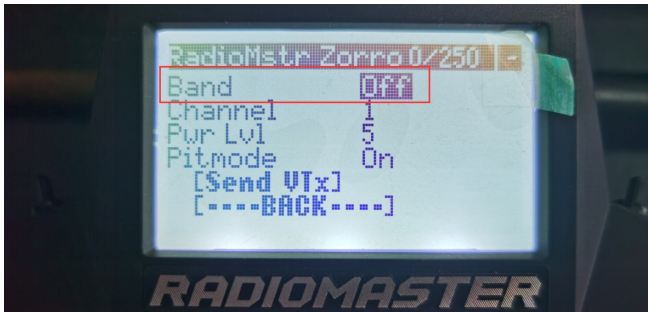
Package Includes	
Item Name	Qty
Bassline 2inch frame and canopy	1
Flight controller Option1: X12 Lite V1.0 flight controller built-in SPI ELRS 2.4G receiver	1
Flight controller Option2: CrazyF411 ELRS built-in UART ELRS 2.4G receiver	1
EX1103 KV11000 brushless motor	4
Gemfan toothpick 2023 tri-blade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

BIND PROCEDURE

- 1) Supply power to the flight controller by plug USB, wait until the green 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 green 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 green LED should blinking slowly first then turn to solid, that means binding was successfully. If the green LED still keep double flash after binding ,please change Model Match tab value from "off" to "on" or from "on" to "off"



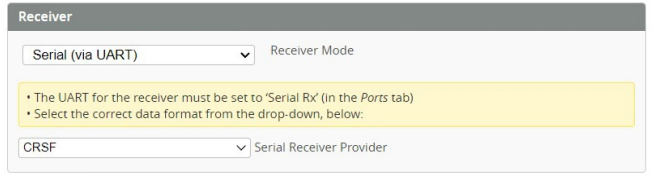
- 3) Check the receiver channel map and channel value is correct after bind successful.



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

PORT AND RECEIVER SETTINGS

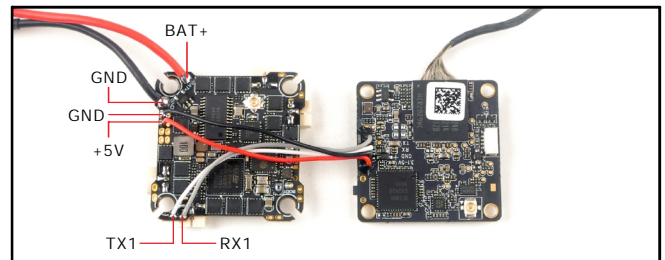
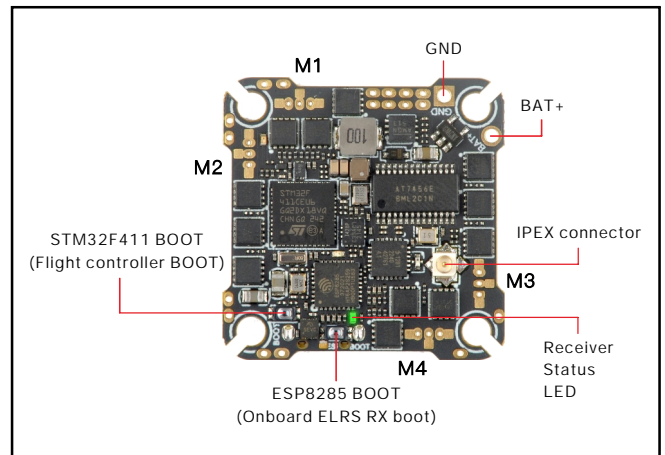
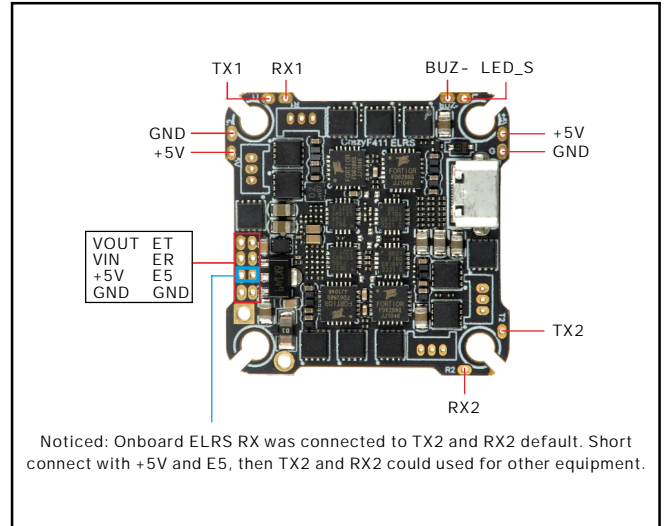
Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200	<input type="checkbox"/>	Disabled / AUTO	Disabled / AUTO	Disabled / AUTO
UART1	115200	<input type="checkbox"/>	Disabled / AUTO	Disabled / AUTO	Disabled / AUTO
UART2	115200	<input checked="" type="checkbox"/>	Disabled / AUTO	Disabled / AUTO	Disabled / AUTO



***OSD display command for Walksnail UART ELRS version if you re-flashed firmware:

```
set osd_displayport_device = MSP
set displayport_msp_serial = 0
save
```

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 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.

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

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)

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

12 Motor Idle (% , static)

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	[Slider]		
Tracking: P & I Gains	1	[Slider]		
Stick Response: FF Gains	1.25	[Slider]		
Dynamic Damping: D Max	0	[Slider]		
Drift - Wobble: I Gains	1.15	[Slider]		
Pitch Damping: Pitch:Roll D	0.9	[Slider]		
Pitch Tracking: Pitch:Roll P, I & FF	1	[Slider]		
Master Multiplier:	1	[Slider]		

Throttle and Motor Settings

5 Throttle Boost

100 Motor Output Limit

0 Dynamic Idle Value [* 100 RPM]

Vbat Sag Compensation 100 %

Thrust Linearization

Miscellaneous Settings

Disable Cell Count - for auto Profile switching

20 Acro Trainer Angle Limit

Integrated Yaw

0 Absolute Control

Angle/Horizon	Strength	Transition
Angle	50	
Horizon	50	75
Angle Limit		55

PID Controller Settings

Feed-forward: 5 Jitter Reduction

25 Smoothness

OFF Averaging

18 Boost

95 Max Rate Limit

0.00 Transition

I Term Relax

RP Axes

Setpoint Type

20 Cutoff

Anti Gravity

Permanently enable

Smooth Mode

4.5 Gain

250 Threshold

I Term Rotation

Dynamic Damping: 37 Gain

0 Advance

VOLTAGE AND CURRENTS METER SETTINGS

Voltage Meter

Battery: 0.6 V

110 Scale

10 Divider Value

1 Multiplier Value

Amperage Meter

Battery: 0.00 A

470 Scale [1/10th mW/A]

0 Offset [mA]

ESC SETTINGS

Silabs ESC Setup ESC overview Motors Make interfaces

ESC# 1 - Name: F41-40 for Multicopter Motors Bluejay

Misc: BLHeLi_5 Revision: 0.18

Startup Power: 0.50

Motor Direction: Normal

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

Read Setup Write Setup Flash BLHeLi Flash Other

Port: COM 3 Baud: 115200 Disconnect Multiple ESC / Master#1

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 "CRAZYBEEF4DX", 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