

Features
X12 5-IN-1 AIO flight controller built-in 2.4G ELRS V2.0 and OPENVTX
VTX Power up to 400mw
Support ELRS V3.0 (Need to upgrade firmware)
Powerful EX1103 KV11000 motors
CaddxFPV Ant FPV camera
Recommend 2S 350mah/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 2S 2inch Micro FPV toothpick drone
Wheelbase: 90mm
Size: 115mm*115mm*40mm
Analog version Weight: 40gram

Package Includes	
Item Name	Qty
Bassline 2inch frame and canopy	1
Option1: X12 ELRS V2.1 flight controller built-in SPI ELRS 2.4G receiver	1
Option2: X12 Frsky V2.1 flight controller built-in SPI Frsky 2.4G receiver	
Option3: X12 Flysky V1.0 flight controller built-in SPI Flysky 2.4G receiver	
Option4: X12 PNP V1.1 flight controller without onboard receiver	
EX1103 KV11000 brushless motor	4
Gemfan toothpick 2023 tri-blade propellers(4cw+4ccw)	1
Caddx ANT 1200TVL Camera	1
Onboard 5.8G Openvtx 0mw-400mw VTX	1
Canopy for 14mmx14mm camera	1

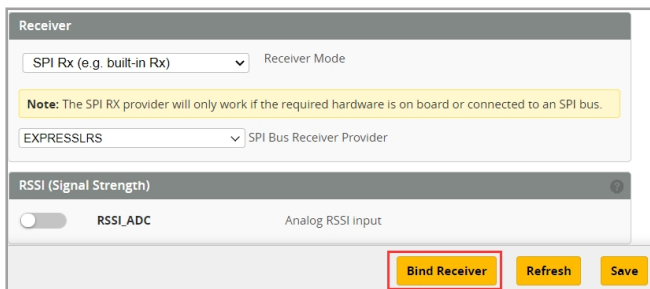
BIND PROCEDURE

*The default Bassline ELRS version support ExpressLRS 2.x.x version TX module.

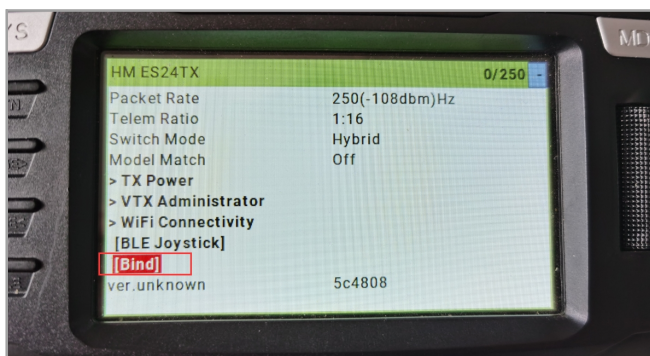
If your TX module already upgrade to v3.x.x , then need to download new flight controller firmware and flash from this link

<https://bit.ly/3VvzKNT>

1). Connect Bassline 2S 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 hit [Bind]. 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/3Q6HlKb>

and use UID Byte Generator

UID Byte Generator

Binding Phrase: 1 **Tyep your binding phrase**

expresslrs

Not updating?

If the fields below don't update as you type your binding phrase above, refresh or reload this page in your browser.

UID Bytes 2 **Waiting the updates**

212, 50, 59, 163, 20, 74

Setting Binding Phrase

Go to Betaflight CLI and enter the following commands. 3 **Copy the commands to CLI**

```
set expresslrs_uid = 212,50,59,163,20,74
save
```

ARM/DISARM THE MOTOR

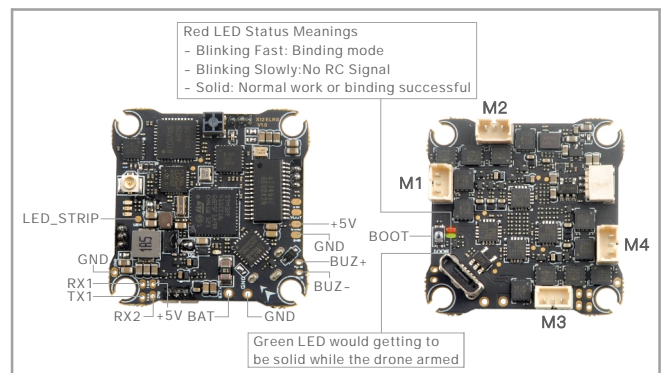
1)Turn on your radio transmitter and connect the battery to the Bassline 2S ELRS. Then place Bassline 2S ELRS horizontally on the ground.

2)Prepare your goggles, and match the channel with the VTX_table

VTX Table										
		6	Number of bands		8	Number of channels by band				
Name	Letter	Factory	1	2	3	4	5	6	7	8
BOSCAM_A	A		5865	5845	5825	5805	5785	5765	5745	5725
BOSCAM_B	B		5733	5752	5771	5790	5809	5828	5847	5866
BOSCAM_E	E		5705	5685	5665	5645	5625	5605	5585	5565
FATSHARK	F		5740	5760	5780	5800	5820	5840	5860	5880
RACEBAND	R		5658	5695	5732	5769	5806	5843	5880	5917
LOWRACE	L		5333	5373	5413	5453	5493	5533	5573	5613
Number of power levels										
1	2	3	4	5	Value					
10	2	14	20	26						
0	RCE	25	100	400	Label					

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



Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200		Disabled	Disabled	Disabled
UART1	115200		Disabled	Disabled	Disabled
UART2	115200		Disabled	Disabled	Disabled

*RX1/TX1/+5V/GND pads could be used for External Serial Based RX like ELRS / CRSF /FRSKY receiver

*Only Enabled Serial RX for UART1 when use external Serial Based RX and choose correct receiver provider based on your receiver description.

BOARD AND SENSOR ALIGNMENT AND FREQUENCY SETTINGS

Board and Sensor Alignment

0 Roll Degrees
0 Pitch Degrees
0 Yaw Degrees

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

☒ 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)

10
Motor Idle (%, static)

PROP OUT :

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

DEFAULT PID AND FILTER SETTINGS

Basic/Acro

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

Mode: RPV

	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		

More Filtering
Default Filtering
Less Filtering

Gyro Filter: 1
D Term Filter: 1

Profile independent Filter Settings

☐ Gyro Lowpass 1

☒ Gyro Lowpass 2
135
Static Cutoff Frequency [Hz]
PT2
Filter Type

☐ Gyro Notch Filter 1
☐ Gyro Notch Filter 2

☒ Dynamic Notch Filter
3
Notch Count
300
Q factor
150
Min Frequency [Hz]
600
Max Frequency [Hz]

Profile dependent Filter Settings

☒ D Term Lowpass 1
DYNAMIC
Mode
75
Min Cutoff Frequency [Hz]
150
Max Cutoff Frequency [Hz]
5
Dynamic Curve Expo
PT1
Filter Type

☒ D Term Lowpass 2
150
Static Cutoff Frequency [Hz]
PT1
Filter Type

☐ D Term Notch Filter
☐ Yaw Lowpass Filter
☐ Yaw Lowpass Filter

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 mV/A]

0
Offset [mA]

"FLIP OVER AFTER CRASH" PROCEDURE

Set one channel of your radio transmitter to activate the Flip over function in the Mode tab of Betaflight configurator.

The default Switch for Activate "Flip" is AUX3(Channel7)

FLIP OVER AFTER CRASH
AUX 3

Add Link
Add Range

Min: 1800
Max: 2100

Crashed
Disarm The Quad
Activate Flip over
Arm The Quad
Move stick to flip the Quad

VTX BANDS AND CHANNELS SETUP

Frequency and channel frequency table:

FR	CH	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
BOSCAM_A	5865M	5845M	5825M	5805M	5785M	5765M	5745M	5725M	
BOSCAM_B	5733M	5752M	5771M	5790M	5809M	5828M	5847M	5866M	
BOSCAM_E	5705M	5685M	5665M	5645M	5885M	5905M	5925M	5945M	
FATSHARK	5740M	5760M	5780M	5800M	5820M	5840M	5860M	5880M	
RACEBAND	5658M	5695M	5732M	5769M	5806M	5843M	5880M	5917M	
LOWRACE	5333M	5373M	5413M	5453M	5493M	5533M	5573M	5613M	

Use smart audio to change the vtx . First you should turn off band for vtx administrator from ExpressLRS.lua and then choose the belowing method:

HM ES24TX
0/250

Band
Channel
Pwr Lvl
Pitmode
[Send VTx]
[---BACK---]

Off
6
5
Off

1. Plug USB to Bassline 2S ELRS then we should Go to Betaflight CLI type the command

Set vtx_band=3

Set vtx_channel=1

save

This command will change the vtx channel to 5705

2.Disarm the Bassline 2S ELRS and then move the stick of the transmitter

THR MID YAW LEFT PITCH UP to enter OSD Menu Enter to Features then enter to VTX

SA to set VTX Band and channel

SMARTAUDIO
F R4 5769 0
> BAND
CHAN
(FREQ)
POWER
PIT
SET
CONFIG
BACK

RACEBAND
4
5769
400
OFF
>
>

ESC SETTINGS

ESC# 1 - Name
Z-H-30 for Multicopter Motors
BLHeLi_5 Revision: 16.7

Startup Power
1.00
Temperature Protection
140
Low RPM Power Protect
On

Motor Direction
Reversed
Demag Compensation
Low
Motor Timing
Medium

Misc
PPM Min Throttle
1148
PPM Max Throttle
1832
PPM Center Throttle
1488
Startup Beep Volume
40
Beacon/Signal Volume
80
Beacon Delay
10 minutes
Brake On Stop
Off

Read Setup
Write Setup
Flash BLHeLi
Flash Other

Port: COM 3
Baud: 115200
Disconnect
Multiple ESC / Master#1
1 2 3 4
Check

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 betafliht 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.

Zadig
Device: Options: Help

STM32 BOOTLOADER
Driver: STLink32 (v3.0.4.0)
WinUSB (v6.1.7600.16385)
Replace Driver

More Information
WinUSB (usb)
libusb-win32
libusb
WinUSB (Microsoft)

8 devices found.
Zadig 2.2.689



Firmware and diff download