

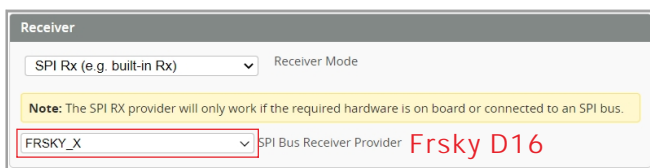
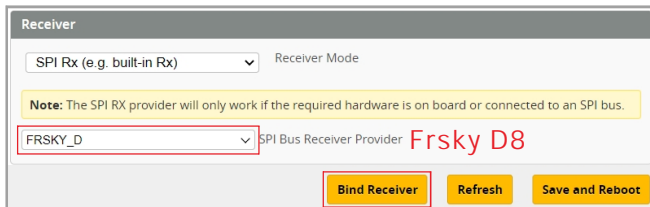
Features
X12 5-IN-1 AIO flight controller built-in 2.4G ELRS V2.0 and OPENVTX
VTX Power up to 400mw
Support ELRS V3.0 (Need to upgrade firmware)
Powerful EX1103 KV11000 motors
CaddxFPV Ant FPV camera
Recommend 2S 350mah/450mah/550mah/650mah battery (Not include)
Battery tray size: Maximum support for 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

1). Connect Bassline 2S Frsky 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 getting solid, it means onboard SPI Frsky receiver is in bind mode.



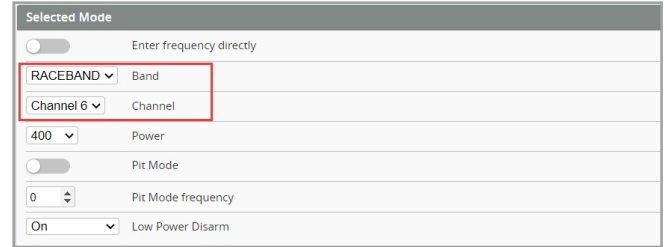
2).The default SPI Receiver provider is set to Frsky_D, that means you need to bind with your Frsky D8 radio transmitter or other radio with Frsky D8 tx module. Turn on your radio and move to model setup ,then hit BND . The bottom RED LED of the flight controller would start to blinking , it means bind successfully.

****Change Receiver provider to "FRSKY_X" for D16 radio,and Change to "REDPINE" or "SFHSS" to match REDPINE TX module or Futaba Radio.**

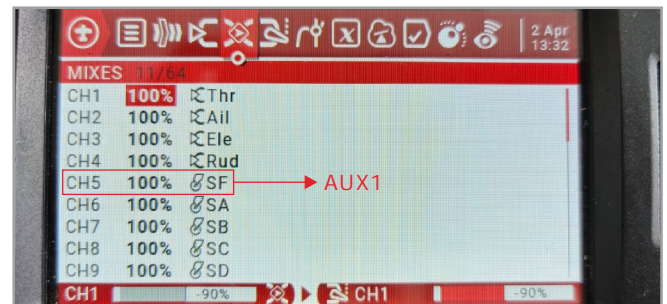
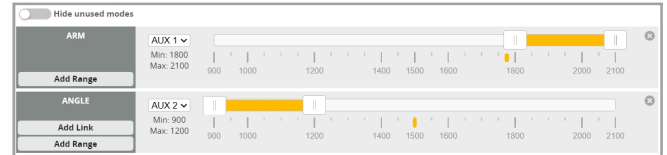


ARM/DISARM THE MOTOR

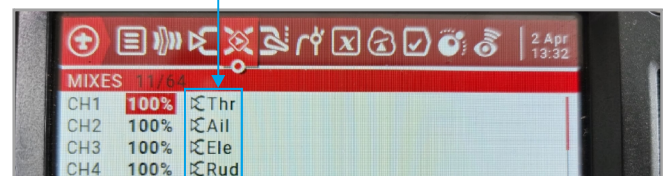
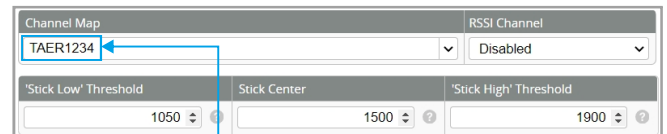
- 1)Turn on your radio transmitter and connect the battery to the Bassline 2S Frsky. Then place Bassline 2S Frsky horizontally on the ground.
- 2)Prepare your goggles, and match the channel with the VTX_table



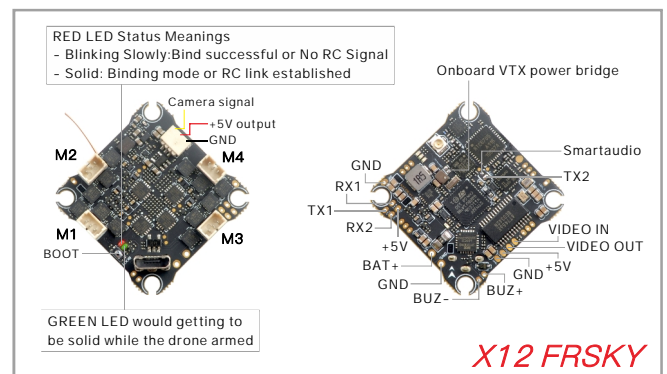
3)The default ARM/DISARM switch was set to "AUX1", usually it's Channel5 of your radio. You can customized a switch for AUX1(Channel5). Then Toggle Aux1 switch to arm the motors, the LED at the bottom Green of the flight controller would get solid once armed, happy flying.



4)Please make sure the MIXES of your radio settings is match the Channel Map of betaflight settings,otherwise it won't be able to armed. The default channel map is "TAER1234", you can also set it to "AETR1234" if necessary.









FLIGHT CONTROLLER CONNECTION DIAGRAM



Ports WIKI

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.

Note: Do **NOT** disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	 115200 ▾		Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART1	 115200 ▾		Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART2	 115200 ▾		Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	VTX (TBS Smv) ▾ AUTO ▾

*RX1/TX1/+5V/GND pads could be used for External Serial Based RX like ELRS Receiver,TBS Tracer or CRSF Nano RX

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

MOTORS AND ESC SETTINGS

Mixer

Quad X

Motor direction is reversed

PROP OUT :

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

ESC/Motor Features

DSHOT300
ESC/Motor protocol

MOTOR_STOP

Don't spin the motors when armed

ESC_SENSOR

Use KISS/BLHei_32 ESC telemetry **over a separate wire**

Bidirectional DShot (requires supported ESC firmware)

10
Motor Idle (%, static)

DEFAULT PID AND FILTER SETTINGS

	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**

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

Gyro Filter: 1
D Term Filter: 1

Profile independent Filter Settings: OFF

Profile dependent Filter Settings: ON

Gyro Lowpass Filters:

Gyro Lowpass 1: 135
Static Cutoff Frequency (Hz)
PT2 Filter Type

Gyro Notch Filters:

Gyro Notch Filter 1: 3
Notch Count
300 Q factor
150 Min Frequency (Hz)
600 Max Frequency (Hz)

Dynamic Notch Filter:

Dynamic Notch Filter: 3
Notch Count
300 Q factor
150 Min Frequency (Hz)
600 Max Frequency (Hz)

D Term Lowpass Filters:

D Term Lowpass 1: 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:

D Term Notch Filter: 3
Notch Count
300 Q factor
150 Min Frequency (Hz)
600 Max Frequency (Hz)

Yaw Lowpass Filter:

Yaw Lowpass Filter: 3
Notch Count
300 Q factor
150 Min Frequency (Hz)
600 Max Frequency (Hz)

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

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	

1. Plug USB to Bassline 2S Frsky 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

```

Entering CLI Mode, type 'exit' to return, or 'help'
#
# Building AutoComplete Cache ... Done!
#
# Set vtx_band = 3
vtx_band set to 3
# set vtx_channel = 1
vtx_channel set to 1
# save

```

2.Disarm the Bassline 2S Frsky 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



ESC SETTINGS

ESC# 1 - Name: EMPTY
Startup Power: 1.00
Temperature Protection: 140
Low RPM Power Protect: On

Z-H-30 for Multicopter Motors
BLHei_5 Revision: 16.7
Motor Direction: Reversed
Demag Compensation: Low
Motor Timing: Medium

Misc
PPM Min Throttle: 1148
Startup Beep Volume: 40
PPM Max Throttle: 1832
Beacon/Signal Volume: 80
PPM Center Throttle: 1488
Beacon Delay: 10 minutes
1.22
Brake On Stop: Off

Read Setup
Write Setup
Flash BLHei
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 "CRAZYBEEF4FR", 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.

Zadig
Device: Options: Help

STM32 BOOTLOADER
Driver: STMicroelectronics (v3.0.4.0)
WinUSB (v6.1.7600.16385)
USB ID: 0483 DF11
WCD: 2
Replace Driver

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

8 devices found.
Zadig 2.2.689



Firmware and diff download