

Features

New AIO 5in1 ELRSF4 2G4 flight controller
CADDX ANT Camera
New 1202.5 brushless motor
18650 Single battery
High performance radio link
Cruise time around 17 min with a single 18650 battery

Specifications

Brand Name: HappyModel
Item Name: Crux3 NLR
Wheelbase: 115mm
Size: 97mmx97mmx35mm(without propellers)
Weight: 68g(without battery)

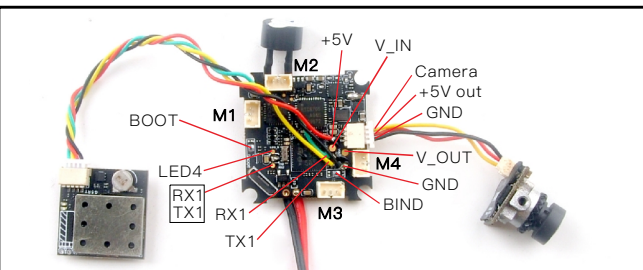
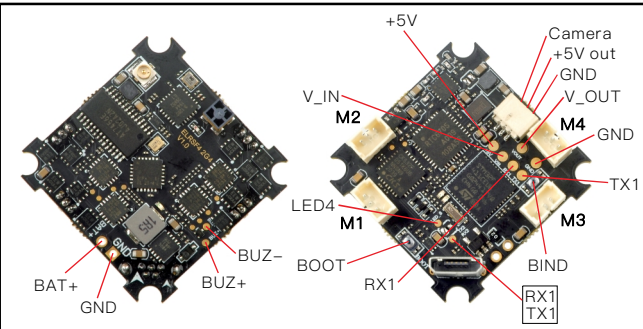
Receiver option

Built-in SPI ExpressLRS 2.4GHz receiver

Package includes

Item Name	No GPS version	With GPS version
Crux3 NLR Frame	1	1
ELRSF4 2G4 AIO 5-in-1 flight controller	1	1
HappyModel Mini M8N GPS	0	1
Buzzer	1	1
HappyModel EX1202.5 KV11500 brushless motor	4	4
Gemfan 75mm bi-blade Propellers(4cw+4ccw)	1	1
Caddx Ant 1200TVL Global WDR with OSD 2g Ultra Light Nano FPV Camera	1	1
Onboard 5.8G 25mw~200mw 40ch vtx (Flight controller built-in)	1	1
Screw Driver	1	1
Propeller disassemble tool	1	1

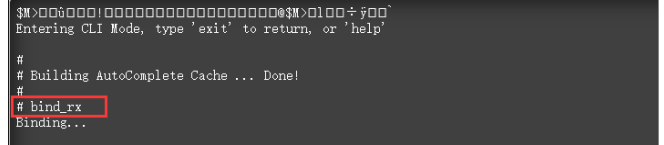
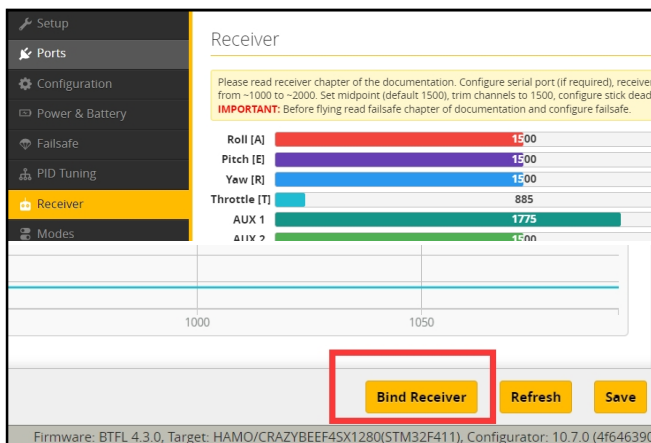
Flight controller connection diagram



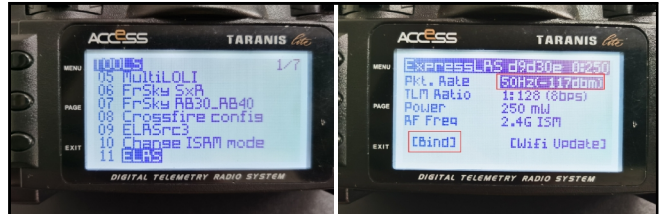
Binding procedure

Please make sure that the Opentx version of your radio transmitter has been upgraded to 2.3.1 or latest and also the ELRS TX module firmware version has been upgrade to 1.0.0 or 1.0.1 before you starting to bind with the Crux3 NLR FPV Drone.

1. Power the flight controller by connecting USB. And open Betaflight Configurator(Latest version) to connect, enter to the "receiver" interface, and then click "Bind Receiver", the red LED at the bottom of the flight controller will flash quickly which means that the SPI ELRS receiver enters the bind mode. There is another way to make the receiver enter the bind mode: after connecting to the Betaflight configurator, move to the CLI interface and enter "bind_rx" in the command line.



2. After correctly connecting the ELRS 2.4GHz Tx module to your Opentx radio transmitter, copy the latest version of ELRS.LUA file to the SD card in the remote controller. The directory is "SD Card/Scripts/tools". Then run ELRS.LUA and set Pkt.Rate to "50Hz" to match with the flight controller. Then click "bind" to bind with the SPI ExpressLRS receiver. After the binding is successful, the Red LED at the bottom of the flight controller will getting to be solid, and the telemetry can be received at the same time.



3. Check the receiver channel map and channel value is correct after bind successful. If the channel value is abnormal after bind successful, you can enter the following command in CLI

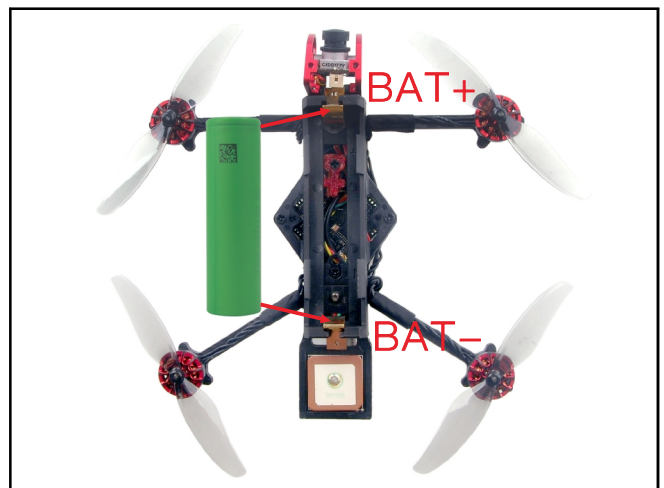
```
set expresslrs_hybrid_switches = ON
save
```

Noticed: The Pkt.Rate was set to "50Hz" for the Crux3 NLR out of factory. Only the same Pkt.Rate between the radio and the SPI receiver could link together. You can also change it from the CLI Command by the following command.

```
Set expresslrs_rate_index = 3
Allowed range: 0 - 4
Default value: 0
0=500Hz,1=250Hz,2=150Hz,3=50Hz,4=25Hz
```

Arm/Disarm the Motor

1.Turn on your radio transmitter and be careful to insert the 1 cell 18650 battery to the battery tray. Then place Crux3 NLR horizontally on the ground. In order to get a better performance we highly recommend to use Sony VTC6 18650 battery.

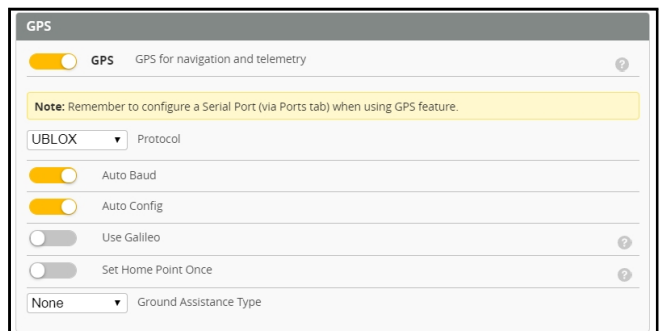


2.GPS Version should waiting for GPS Fixed and got at least 6 satellites

3.Toggle Aux1 switch to arm the motors, the Green LED at the bottom of the flight controller would get be solid once armed, happy flying.

GPS Setting and GPS Rescue explain

- Before Armed, GPS must search for more than 6 satellites to lock the home position.
- After armed, observe the OSD data during the flight, and the rescue function can work normally only if the distance exceeds 100 meters. Otherwise, the quad will crash. If the remote controller suddenly loses signal, the GPS rescue function will work automatically and return to the home position, but the drone won't land automatically. You need to slightly control the stick to gain control of the drone when the remote control signal is restored and then control the drone to land.
- In order to avoid mistake operation, we didn't enable Aux Channel to activate the GPS rescue function by default. You can set it by yourself from the mode tab of Betaflight configurator.
- Inclement weather or environmental interference will affect the normal operation of GPS rescue function. We are not responsible for any crash or any other losses caused by GPS rescue.



VTX Bands and Channels setup

Frequency and channel frequency table:

FR	CH	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Band1(A)		5865M	5845M	5825M	5805M	5785M	5765M	5745M	5725M
Band2(B)		5733M	5752M	5771M	5790M	5809M	5828M	5847M	5866M
Band3(E)		5705M	5685M	5665M	5645M	5625M	5605M	5585M	5565M
Band4(F)		5740M	5760M	5780M	5800M	5820M	5840M	5860M	5880M
Band5(R)		5658M	5695M	5732M	5769M	5806M	5843M	5880M	5917M

There are 2 ways to switch the vtx channels:

1.If we need to use Channel 5705 then we should Go to Betaflight CLI,type the command:

Set VTX_band=3

Set VTX_channel=1

save

2.Disarm the Crux3 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

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



Mixer type and ESC/motor protocol

Mixer

Quad X

Props Out

Fix the CW propeller onto the M2 and M3 motor (CW motors)

Fix the CCW propellers onto the M1 and M4 motor (CCW motors)

Motor direction is reversed

Default PID setting

	Proportional	Integral	D Max	D Min	Feedforward
Basic/Acro					
ROLL	85	100	85	23	140
PITCH	80	100	85	25	140
YAW	120	100	0	0	140

Note: Sliders are disabled because values were changed manually. Clicking the 'Enable Sliders' button will activate them again. This will reset the values and any unsaved changes will be lost.

Enable Sliders

PID Controller Settings

0.21 Feedforward transition

20 Acro Trainer Angle Limit

5 Throttle Boost

0 Dynamic Idle Value [* 100 RPM]

0 Absolute Control

I Term Rotation

Vbat PID Compensation

Integrated Yaw

I Term Relax

RPY Axes

Setpoint Type

15 Cutoff

D Min

37 Gain

20 Advance

Anti Gravity

Permanently enable Anti Gravity

Smooth Mode

3.5 Gain

ESC Check and Flash firmware

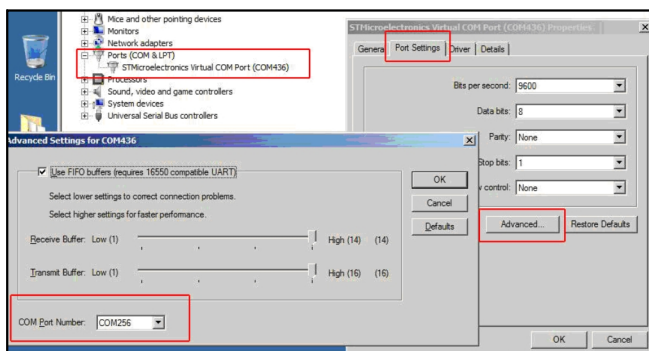
1.Download New release BLHellsuite from:

<https://www.mediafire.com/folder/dx6kfaasvo241/BLHeliSuite>

2.Plug the usb and connect the flight controller to computer



3.Open the Device Manager of your computer, find the Ports, please make sure the Com port Serial Number is under 255, otherwise it will can't connect to the BLHELISUITE. You can change the port serial number like the following step :



4.Open the BLHELISUITE, Select SILABS BLHeli Bootloader (Cleanflight) from the third tab on the top side. Then Select the right Serial com port and Click connect. You can also Flash the new release BLHeli_s firmware via the BLHELISUITE, the firmware Target is "0-H-05"

BLHeliSuite 16.7.14.9.0.1 [m4wCintf Silabs-BL @COM3]

ESC setup ESC tools Select ATME / SILABS Interface Options ? BLHeli info Save Screenshot

Silabs ESC Setup ESC overview Motors Make interfaces

ESC#1 - Name: EMPTY

Startup Power: 1.00

Temperature Protection: 140

Low RPM Power Protect: On

Motor Direction: Reversed

Demag Compensation: Low

Motor Timing: Medium

PPM Min Throttle: 1148

PPM Max Throttle: 1832

PPM Center Throttle: 1488

Brake On Stop: Off

Startup Beep Volume: 40

Beacon/Signal Volume: 80

Beacon Delay: 10 minutes

Flash firmware

Click check to see the details of the 4in1 ESC

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 go to Firmware flasher then choose Load firmware[Local]

4. There are 2 ways to get in DFU Mode: 1). Press boot button and then plug USB to computer 2). loading betafight 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.

As Betaflight has not yet released the official version for CRAZYBEEF4SX1280, you can download the firmware from our website , the target CRAZYBEEF4SX1280 would included in the next official release .

