

# Motowhoop 85mm 2 Inch FPV Racing Drone Manual



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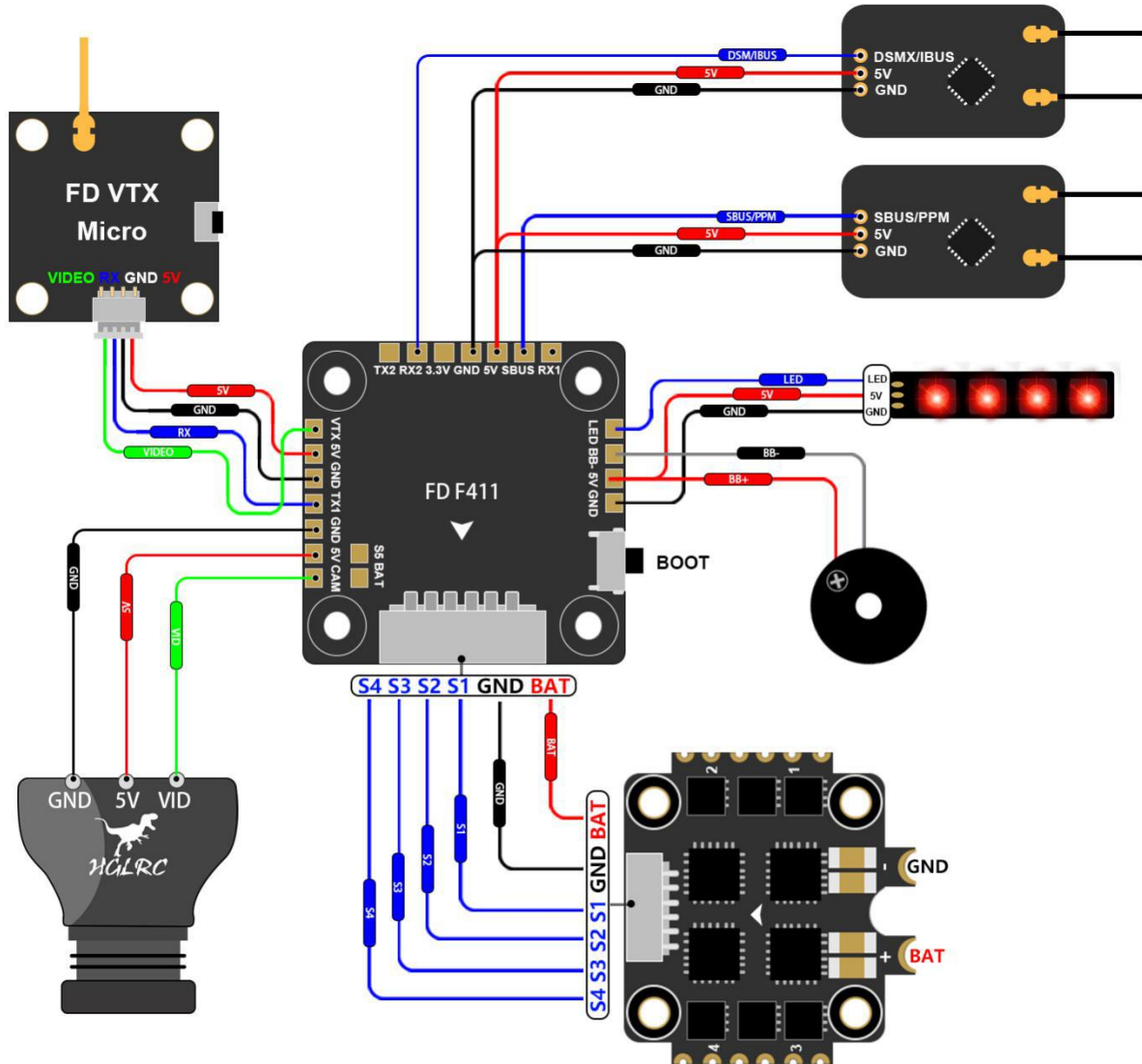
## Package Included

|   |  |
|---|--|
| <b>Motowhoop 85mm 2 Inch FPV Racing<br/>Drone*1</b> |  |
|---|--|

# 1. Product Specifications

| Product parameters |   |
|--------------------|---|
| Model              | Motowhoop 85mm 2 Inch FPV<br>Racing Drone |
| Frame Kit          | Motowhoop 85mm 2 Inch Frame<br>Kit        |
| Flight Controller  | FD411 Flight Controller                   |
| ESC                | FD 13A 4in1                               |
| VTX                | FD VTX Micro                              |
| Camera             | RunCam Nano 2                             |
| Motor              | FD1103 kv8000                             |
| Support receiver   | SBUS .PPM.DSMX.i.BUS                      |
| Input Voltage      | 3S Lipo                                   |
| Weight             | 80.1g                                     |

# 2. Interface Description



## 3. Check the flight control drive

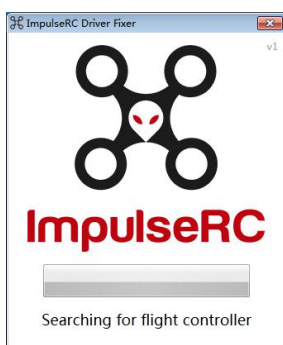
1. Long Press BOOT buttons.connect USB.The system automatically install the driver



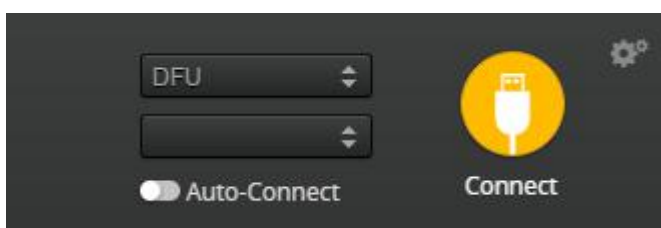
2.Driver cannot be installed, please download ImpulseRC\_Driver\_Fixer



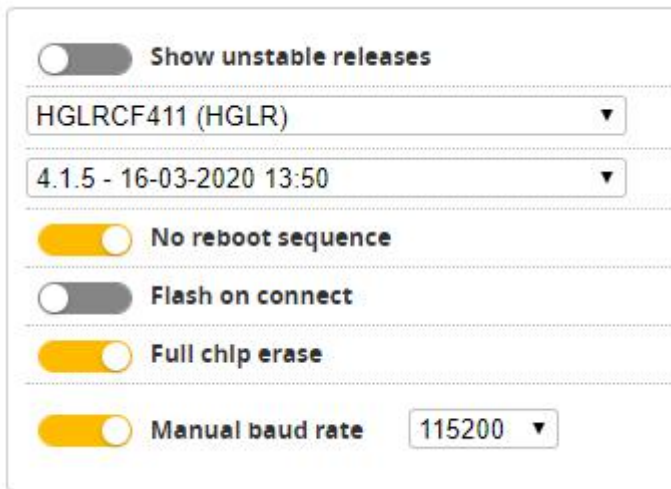
3.Double-click on the run(Plug in the flight controller to automatically install the driver)




4.open betafight configurator , enter DFU mode

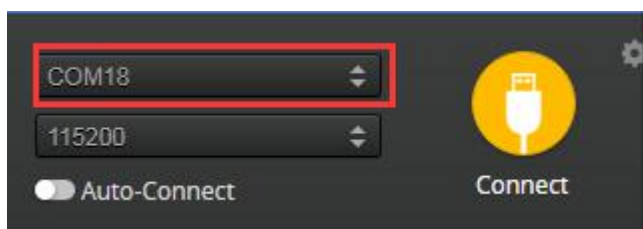


5. Click **Firmware Flasher** Select firmware version



6. Click **Load Firmware [Online]** Load firmware. **Flash Firmware** Waiting for completion **Erasing ...** It will be prompted upon completion. **Programming: SUCCESSFUL**

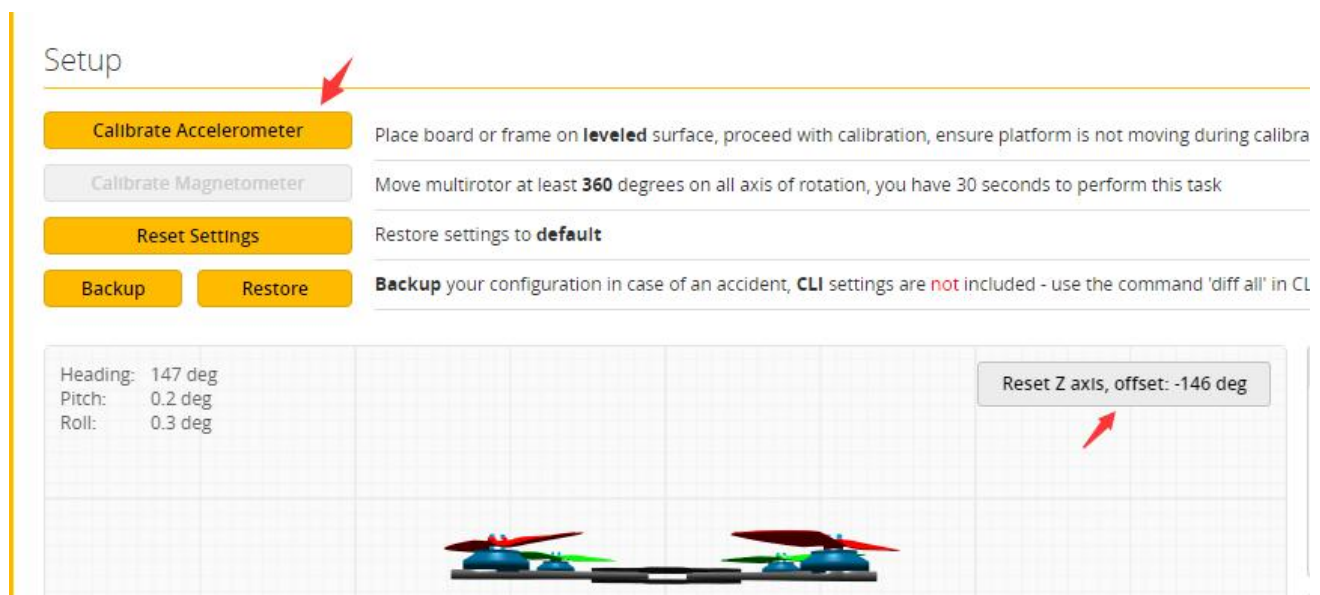
7. open betaflyght configurator  . Controller plugged into the computer. Betaflight Automatically assigned port, click “Connect” Enter setup interface ( Different computer COM )



## 4. Calibration accelerometer

1. Put the aircraft horizontal and click “Reset Z axis”

Click again 




The screenshot shows a web interface for calibrating an accelerometer. It features a 'Setup' section with several buttons: 'Calibrate Accelerometer' (highlighted with a red arrow), 'Calibrate Magnetometer', 'Reset Settings', 'Backup', and 'Restore'. Below these buttons, there are instructions for each step. The 'Calibrate Accelerometer' step instructs the user to place the board on a leveled surface. The 'Reset Settings' step instructs the user to restore settings to default. The 'Backup' and 'Restore' steps instruct the user to backup their configuration in case of an accident, noting that CLI settings are not included. Below the instructions, there is a status panel showing heading, pitch, and roll values, and a 'Reset Z axis, offset: -146 deg' button (highlighted with a red arrow). At the bottom, there is a 3D model of a multirotor aircraft.

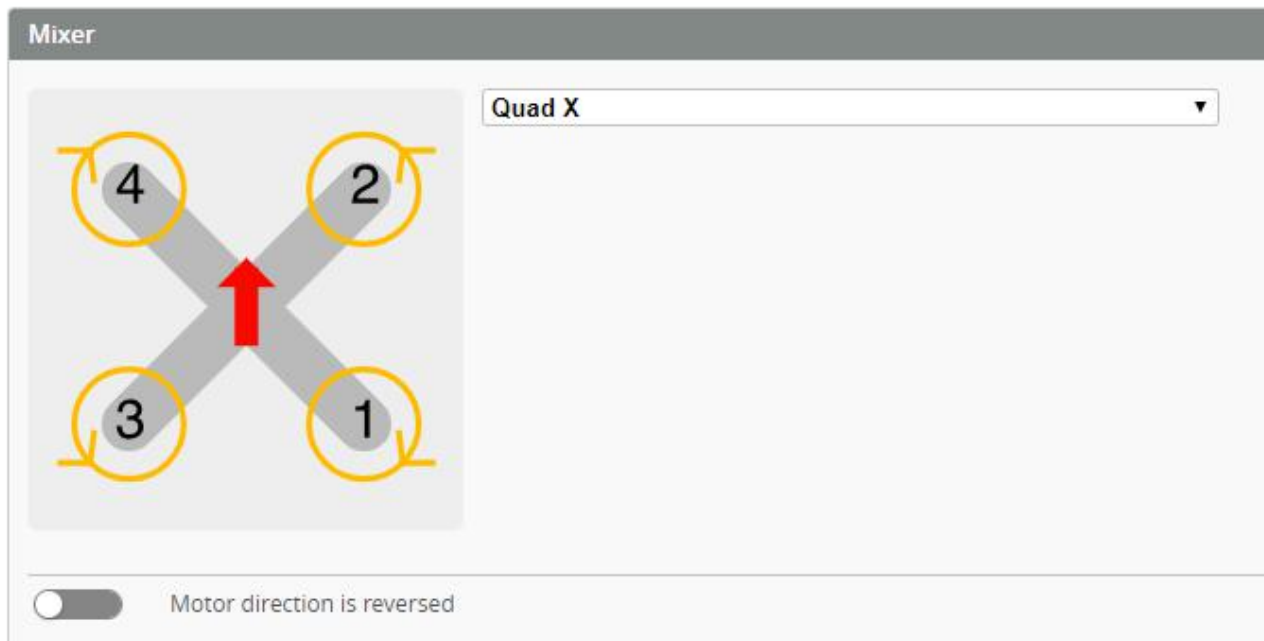
## 5. URAT serial port use


URAT1 uses VTX image transmission

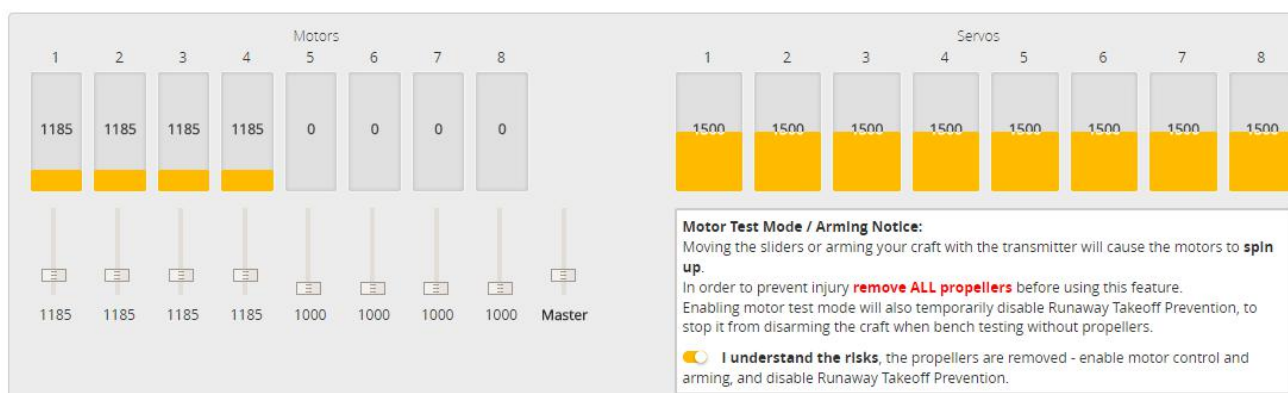
UART2 uses receiver telemetry

# 6. Select aircraft model

1. Click  Configuration Select model



2. Click  Motors Click “I understand the risks” Push Master to check motor steering “Master” Steering can be changed at [BLHeliSuite](#)



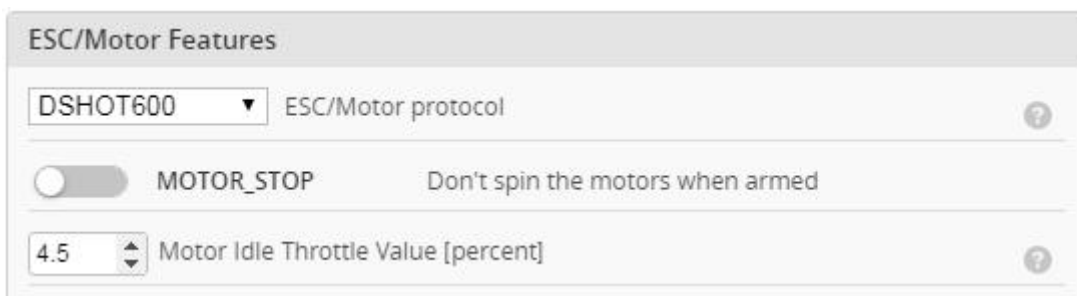


### 3. Flight Controller angle setting



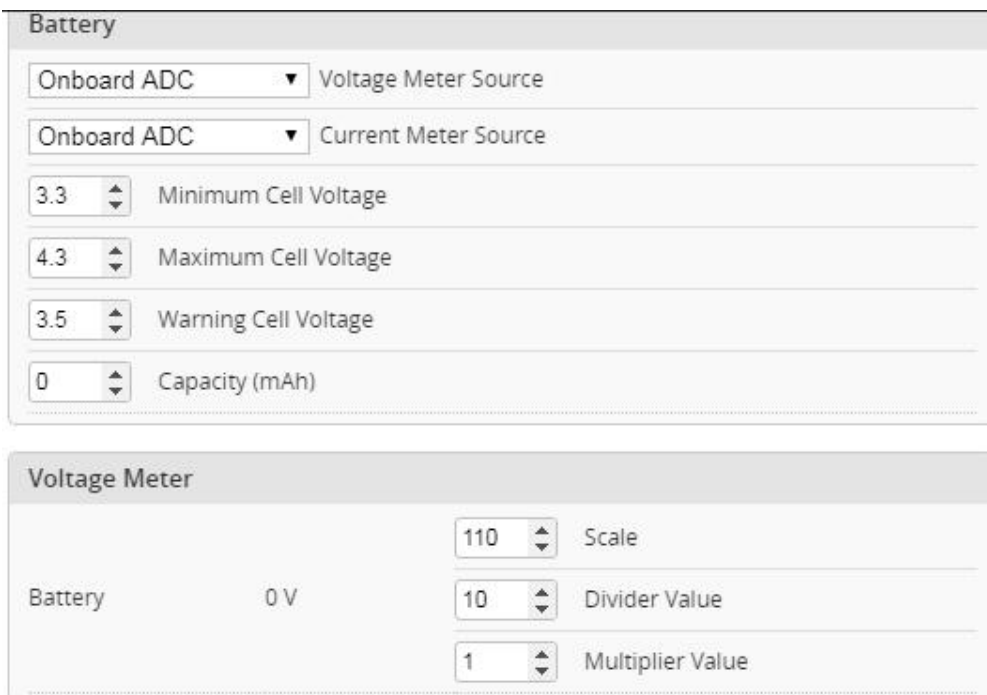
## 7. Choose ESC protocol

1. Choose the right ESC protocol (DSHOT600)



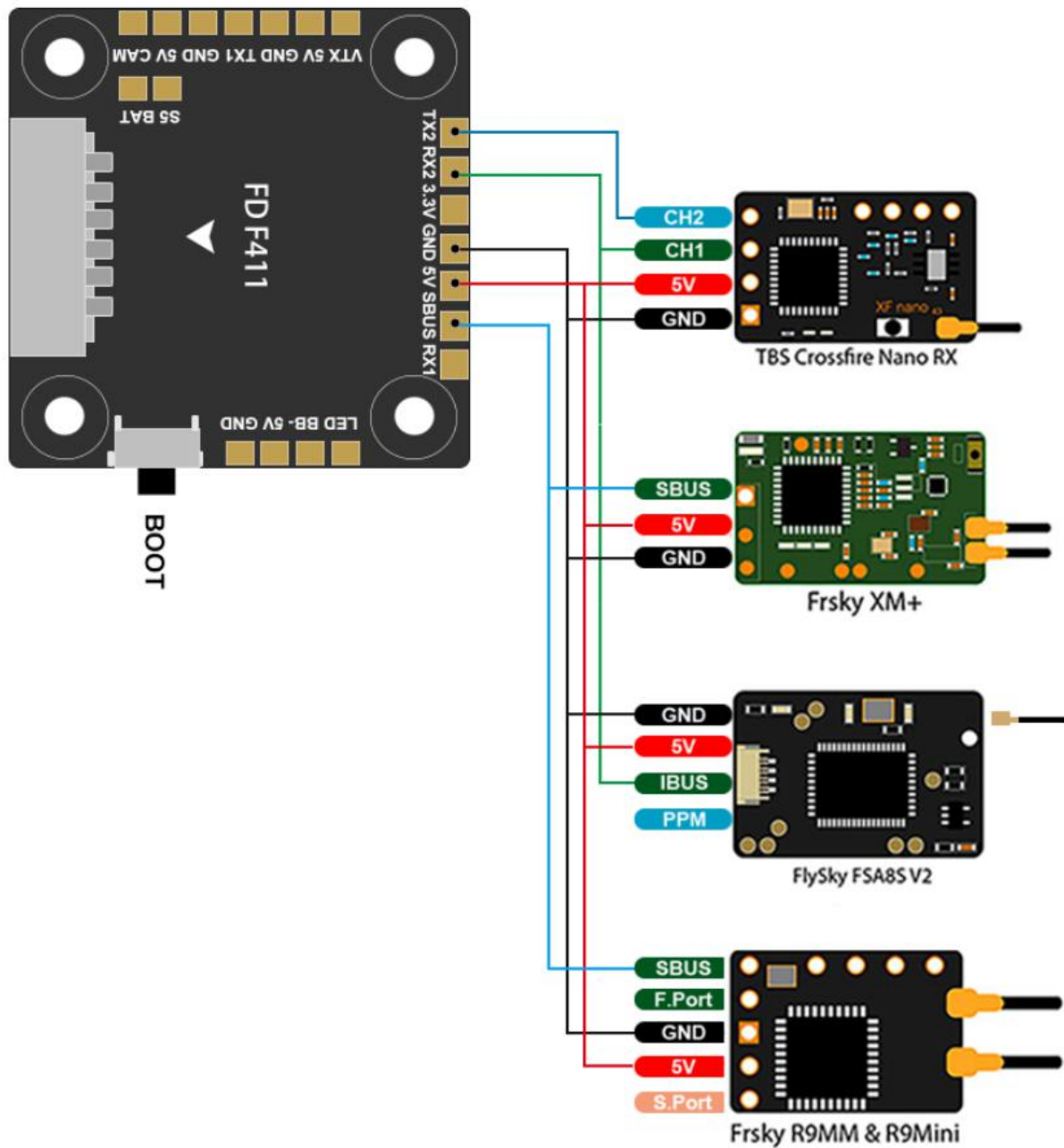
## 8. Voltage parameters setting

1. Click **Power & Battery** Setting parameters



# 9. Setting up the receiver

## 1. Receiver connection diagram



2. Click **Ports** .have found “**UART2**” Open

( **SBUS/DSMX/i.BUS/A8S/XM+/TBS Nano RX/R9MM** ) the receiver serial port

| Identifier | Configuration/MSP                            | Serial Rx                           | Telemetry Output  | Sensor Input      | Peripherals            |
|------------|--|-------------------------------------|-------------------|-------------------|------------------------|
| USB VCP    | <input checked="" type="checkbox"/> 115200 ▼ | <input type="checkbox"/>            | Disabled ▼ AUTO ▼ | Disabled ▼ AUTO ▼ | Disabled ▼ AUTO ▼      |
| UART1      | <input type="checkbox"/> 115200 ▼            | <input type="checkbox"/>            | Disabled ▼ AUTO ▼ | Disabled ▼ AUTO ▼ | VTX (IRC Tran ▼ AUTO ▼ |
| UART2      | <input type="checkbox"/> 115200 ▼            | <input checked="" type="checkbox"/> | Disabled ▼ AUTO ▼ | Disabled ▼ AUTO ▼ | Disabled ▼ AUTO ▼      |

4. Set the **SBUS/XM+** receiver

**Receiver**

Serial-based receiver (SPEKSAT, 5 ▼) Receiver Mode

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

SBUS ▼ Serial Receiver Provider

5. Set the **i.BUS/A8S** receiver

**Receiver**

Serial-based receiver (SPEKSAT, 5 ▼) Receiver Mode

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

iBUS ▼ Serial Receiver Provider

6. Set the **DSMX** receiver

**Receiver**

Serial-based receiver (SPEKSAT, 5 ▼) Receiver Mode

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

SPEKTRUM2048 ▼ Serial Receiver Provider

## 7. Set the R9MM receiver

Receiver

Serial-based receiver (SPEKSAT, S) Receiver Mode

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

SBUS Serial Receiver Provider

## 8. Set the TBS Nano RX receiver

Receiver

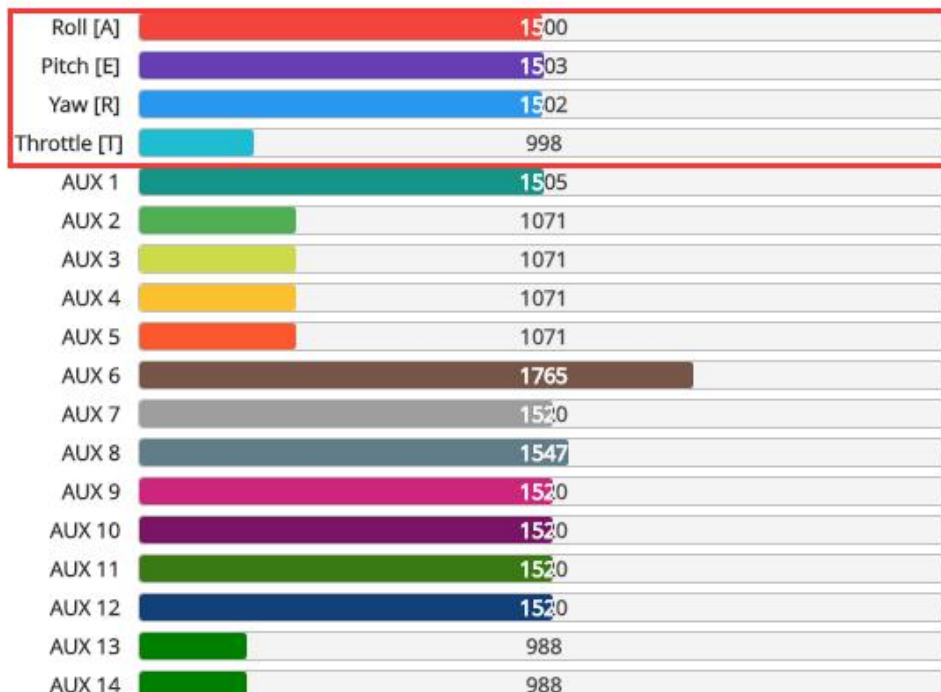
Serial-based receiver (SPEKSAT, S) Receiver Mode

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

CRSF Serial Receiver Provider

# 10. Check receiver signal

1. Click  Receiver Check the remote control output signal



# 11. PID settings

PID Tuning

Profile ▼
Rateprofile ▼

Profile 2 ▼
Rateprofile 1 ▼

**PID Profile Settings** | Rateprofile Settings | Filter Settings

|            | Proportional | Integral | Derivative | D Min | Feedforward |
|------------|--------------|----------|------------|-------|-------------|
| Basic/Acro |              |          |            |       |             |
| ROLL       | 65           | 80       | 50         | 14    | 96          |
| PITCH      | 65           | 80       | 50         | 15    | 96          |
| YAW        | 65           | 75       | 0          | 0     | 100         |

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**

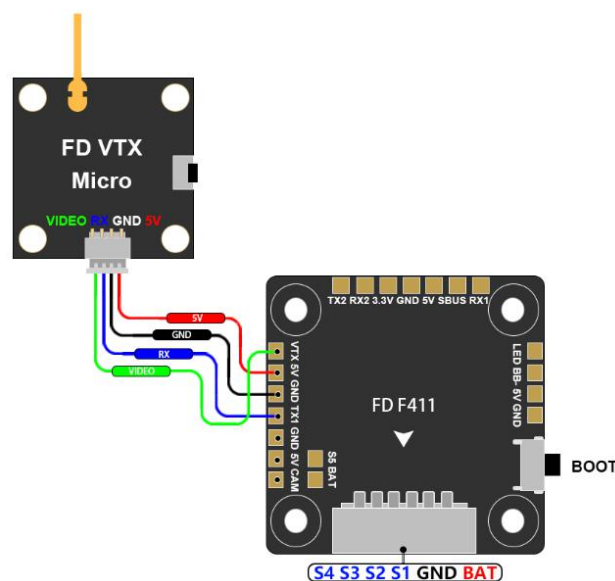
|                                     |  |
|-------------------------------------|--|
| 0                                   | Feedforward transition   |
| 20                                  | Acro Trainer Angle Limit   |
| 5                                   | Throttle Boost   |
| 0                                   | Absolute Control   |
| <input checked="" type="checkbox"/> | I Term Rotation  |
| <input checked="" type="checkbox"/> | Vbat PID Compensation  |
| <input type="checkbox"/>            | Integrated Yaw   |
| <input checked="" type="checkbox"/> | I Term Relax   |
|                                     | <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">RP</div> <div style="font-size: 0.8em;">Axes</div> </div> <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">Gyro</div> <div style="font-size: 0.8em;">Type</div> </div> <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">11</div> <div style="font-size: 0.8em;">Cutoff</div> </div> |
| <input checked="" type="checkbox"/> | D Min  |
|                                     | <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">27</div> <div style="font-size: 0.8em;">Gain</div> </div> <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">20</div> <div style="font-size: 0.8em;">Advance</div> </div>   |
| <input checked="" type="checkbox"/> | Anti Gravity   |
|                                     | <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">Smooth</div> <div style="font-size: 0.8em;">Mode</div> </div> <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px;">2</div> <div style="font-size: 0.8em;">Gain</div> </div>   |

Angle/Horizon ?

|             | Strength | Transition |
|-------------|----------|------------|
| Angle       | 50       |            |
| Horizon     | 50       | 75         |
| Angle Limit |          |            |
|             | 55       |            |

# 12. VTX serial port use. VTX uses OSD smart audio

1. VTX connection diagram





## 2.VTX serial port opens. Select IRC Tramp protocol for VTX。

| Identifier | Configuration/MSP                            | Serial Rx                           | Telemetry Output  | Sensor Input      | Peripherals  |
|------------|--|-------------------------------------|-------------------|-------------------|--|
| USB VCP    | <input checked="" type="checkbox"/> 115200 ▾ | <input type="checkbox"/>            | Disabled ▾ AUTO ▾ | Disabled ▾ AUTO ▾ | Disabled ▾ AUTO ▾  |
| UART1      | <input type="checkbox"/> 115200 ▾            | <input type="checkbox"/>            | Disabled ▾ AUTO ▾ | Disabled ▾ AUTO ▾ | VTX (IRC Tran ▾ AUTO ▾   |
| UART2      | <input type="checkbox"/> 115200 ▾            | <input checked="" type="checkbox"/> | Disabled ▾ AUTO ▾ | Disabled ▾ AUTO ▾ | Disabled<br>Blackbox logging<br>VTX (TBS SmartAudio)<br><b>VTX (IRC Tramp)</b><br>Camera (RunCam Protocol)<br>Benewake LIDAR |


## 3.Frequency sheet

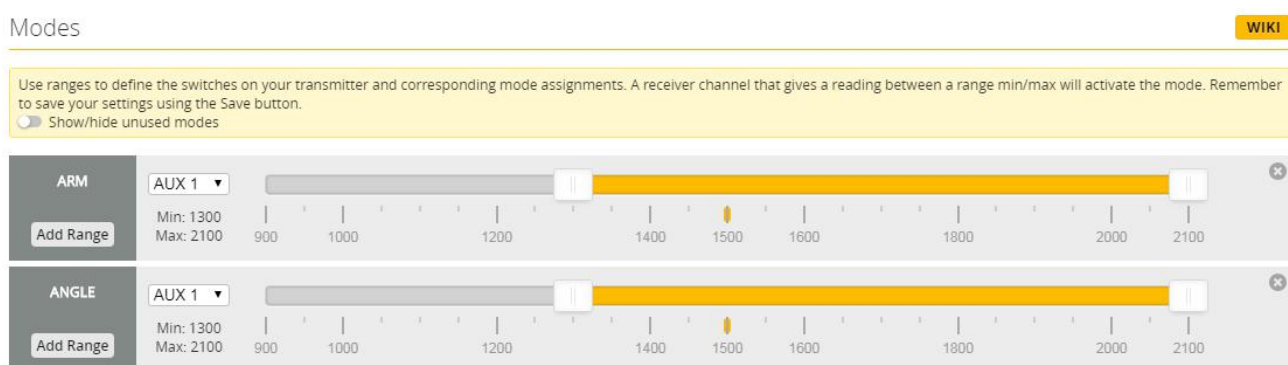
| Frequency Table(Mhz) |      |      |      |      |      |      |      |      |
|----------------------|------|------|------|------|------|------|------|------|
| CH                   | CH1  | CH2  | CH3  | CH4  | CH5  | CH6  | CH7  | CH8  |
| FR                   | ○○○  | ●○○  | ○●○  | ●●○  | ○○●  | ●○●  | ○●●  | ●●●  |
| A(●○○)               | 5865 | 5845 | 5825 | 5805 | 5785 | 5765 | 5745 | 5725 |
| b(○●○)               | 5733 | 5752 | 5771 | 5790 | 5809 | 5828 | 5847 | 5866 |
| E(●●○)               | 5705 | 5685 | 5665 | 5645 | 5885 | 5905 | 5925 | 5945 |
| F(○○●)               | 5740 | 5760 | 5780 | 5800 | 5820 | 5840 | 5860 | 5880 |
| r(●○●)               | 5658 | 5695 | 5732 | 5769 | 5806 | 5843 | 5880 | 5917 |
| L(○●●)               | 5362 | 5399 | 5436 | 5473 | 5510 | 5547 | 5584 | 5621 |

## 4.Power indicator status


| Power mode                    | Pit Mode    | 1 flash stop 3seconds | 2 flash stop 3seconds | 3 flash stop 3seconds | 4 flash stop 3seconds |
|-------------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|
| LED(red)<br>Indicating status | Solid light | 25MW                  | 100MW                 | 200MW                 | 400MW                 |

# 13. Select flight mode startup mode

1. Click  set up the function of remote control switch across the channel (below are for reference only)



# 14. OSD settings

1. Click  the OSD Settings, according to the need to choose, drag the OSD schematic diagram of the parameters can be adjusted.



# 15.LED settings

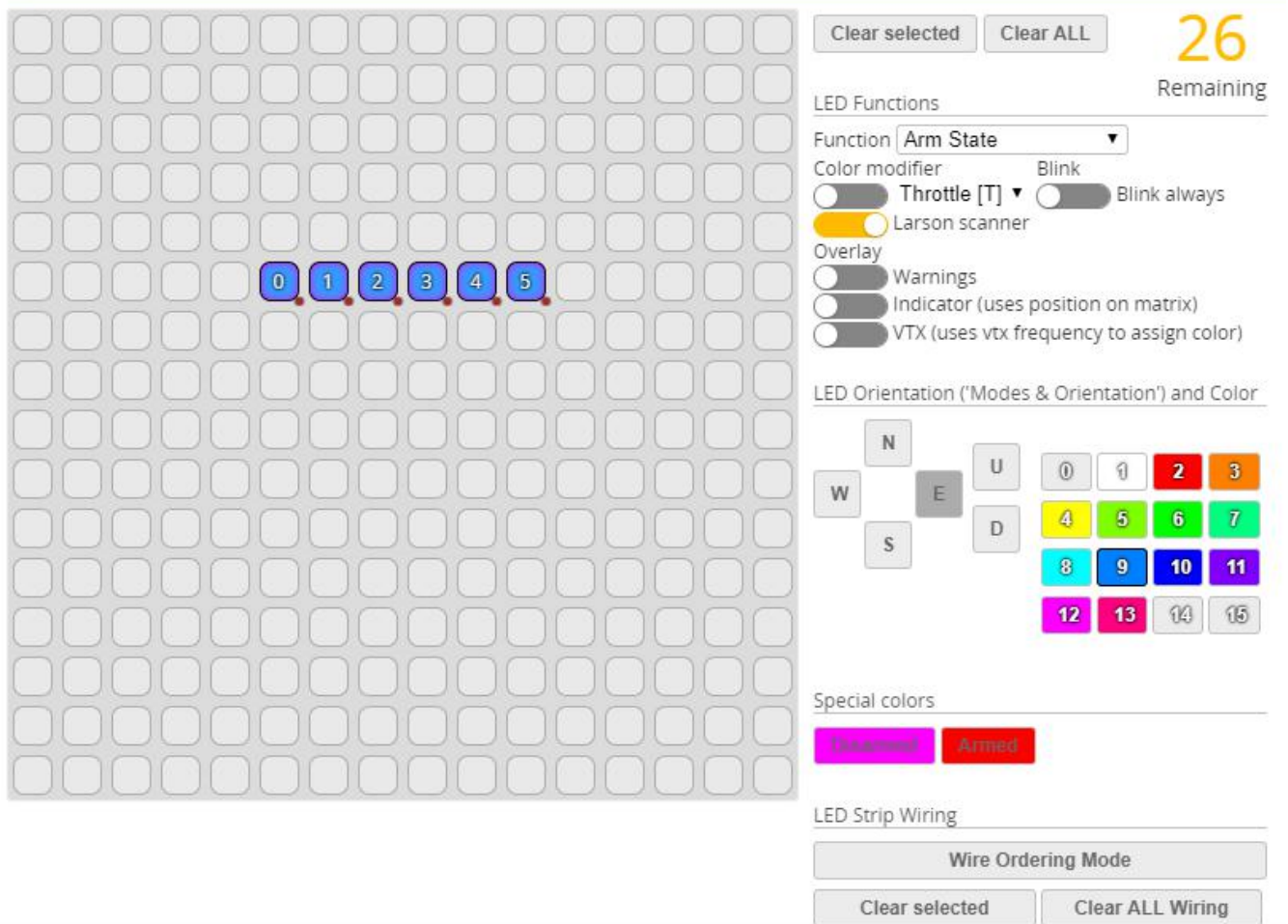
1. Click **Configuration** Turn on LED support



2. Click **LED Strip**. Click **Wire Ordering Mode** set according to need

## LED Strip

The flight controller can control colors and effects of individual LEDs on a strip. Configure LEDs on the grid, configure wiring order then attach LEDs on your aircraft according to grid positions. LEDs without wire ordering number. Double-click on a color to edit the HSV values.



Clear selected Clear ALL **26** Remaining

LED Functions

Function **Arm State**

Color modifier **Blink**

Throttle [T]  Blink always

Larson scanner

Overlay

Warnings

Indicator (uses position on matrix)

VTX (uses vtx frequency to assign color)

LED Orientation ('Modes & Orientation') and Color

N U 0 1 2 3

W E 4 5 6 7

S D 8 9 10 11

12 13 14 15

Special colors

**Disarmed** **Armed**

LED Strip Wiring

Wire Ordering Mode

Clear selected Clear ALL Wiring



# 16. Troubleshooting

## Product daily problems

OSD garbled:

If you find garbled characters, please open Betaflight, click "OSD" .and click "Font Manager" clicks on "Upload Font" to update

When plugged in the battery, the aircraft does not pass the self-test without

"BBB" sound. There is only one sound.

Please check if the ESC agreement is correct

The spin of the aircraft keeps spinning

Please check if the propeller is correct

Please check if the motor direction is correct

## **Warning:**

Please read the cautions as follows, otherwise stability of your flight controller cannot be ensured, your flight controller will even get damaged.

- Keep focus on the polarity. Check carefully before power supply.
- Cut off the power when you connect, plug and pull anything.
- The refresh rate of PID and Gyroscope is up to 8K/8K.

## **after sales question:**

1. After receiving the goods, it is found that the product can not be used normally. If the return to the factory is a quality problem, the repair service will be provided free of charge.
2. If the product is damaged due to improper operation, the repair service may be provided under the condition that the inspection can be repaired.
3. For domestic customers, please contact the after-sales service personnel. For overseas customers, please contact the official website for after-sales service.