Version：202605 V1.0.1

AI+BetaFlight

2-in-1 Flight Controller

User Quick Start Guide

2-in-1 design, no need to purchase a separate flight controller

Plug & Play · Replacement for Standard BF FC

It's out-of-the-box ready with a zero-hassle installation

easy to use, no additional training

Integrated AI Vision Tracking Engine

locking and tracking

Full compatibility with all common（CVBS) analog VTX

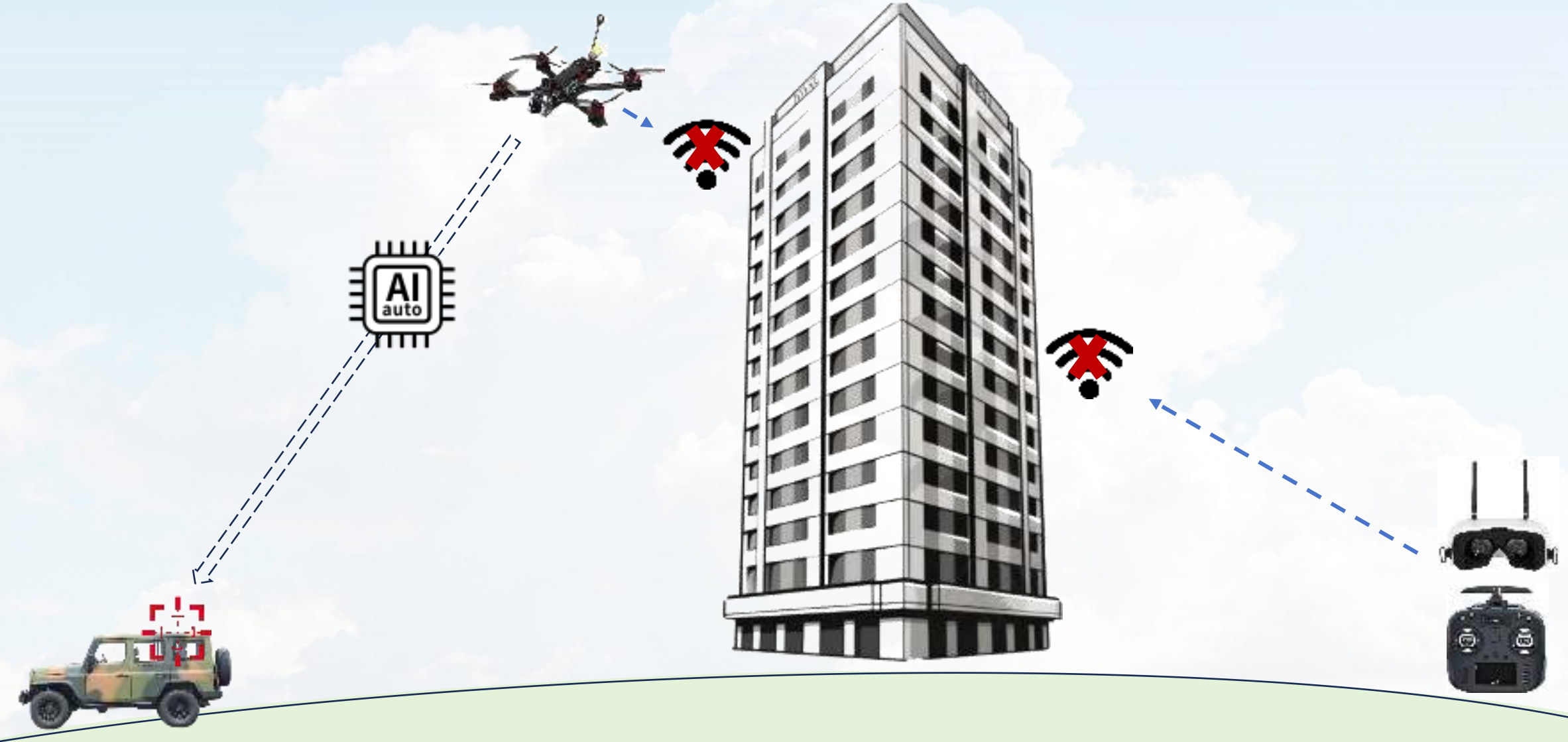
Highly Integrated & Lightweight Design

Features a single-board design that is ultra-lightweight and has low power consumption

Exceptional Cost-Effectiveness

Intelligent AI takeover, fearless in signal blind spots.

Advanced flight control integrated with AI enables seamless human-AI collaboration. When anticipating entry into a signal blind spot, the pilot can smoothly switch to AI takeover mode. Even with a complete loss of remote control and video transmission, the powerful onboard AI can still precisely approach the target, ensuring the mission is accomplished.



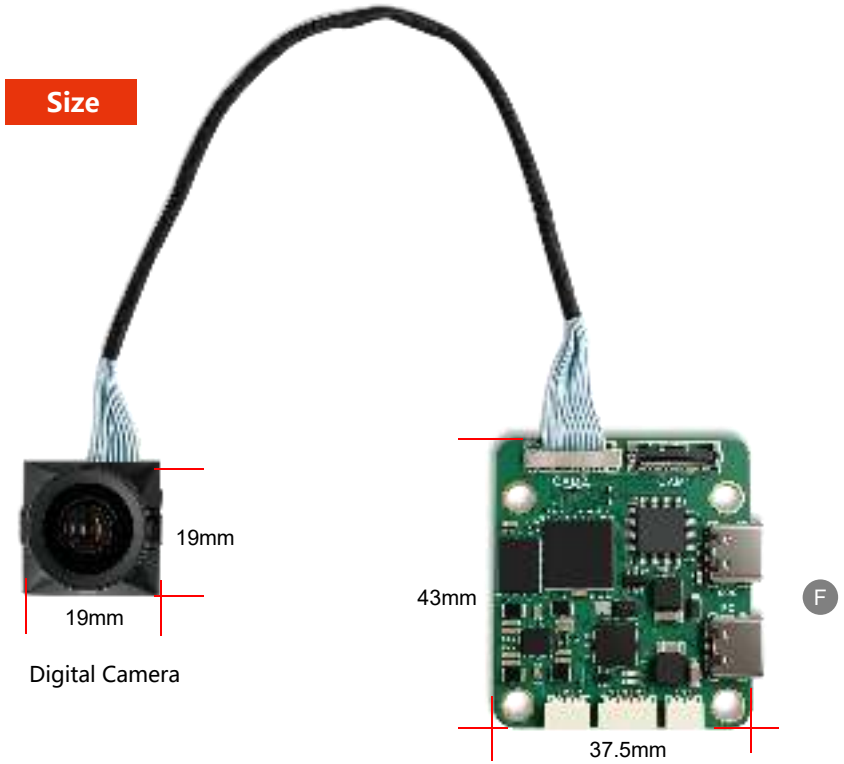
PART 1

Main Parameters

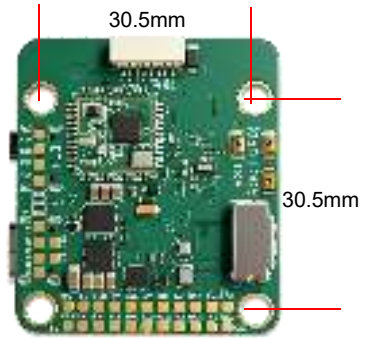
1-Main Parameters

Category	Parameter	Value
Core Specs	Supported Frames	5-18 inch quadcopters
	Firmware	**Beta Flight （No extra purchase.)**
	Input Voltage	4S - 8S LiPo
	Power Consumption	2W
	Weight	10 g
Camera & Vision	Camera Compatibility	1080P Digital Camera
	Lens Focal Length	4mm
	Frame rate	60FPS
	Camera Angle	0-60° (20-30° Recommended)
	Field of View (FOV)	96°
	Video Output Format	CVBS
	Starlight Night Vision	Available
AI Performance	AI Lock Range	Vehicle: 450m | Person: 150m
	Minimum Target Size	20x20 pixels
	Max Target Speed	> 80km/h
	AI Lock Modes	**Hard Lock : Crosshair mandatory lock, Capable of locking onto any kind of targets, moving & stationary.**
Peripherals& Connectivity	Receiver Protocol	ELRS(CRSF)
	ESC Protocol	DSHOT 300/600
	Servo	Two-channel PWM servo signal
Environmental	Operating Temperature	-25°C to 55°C

Size



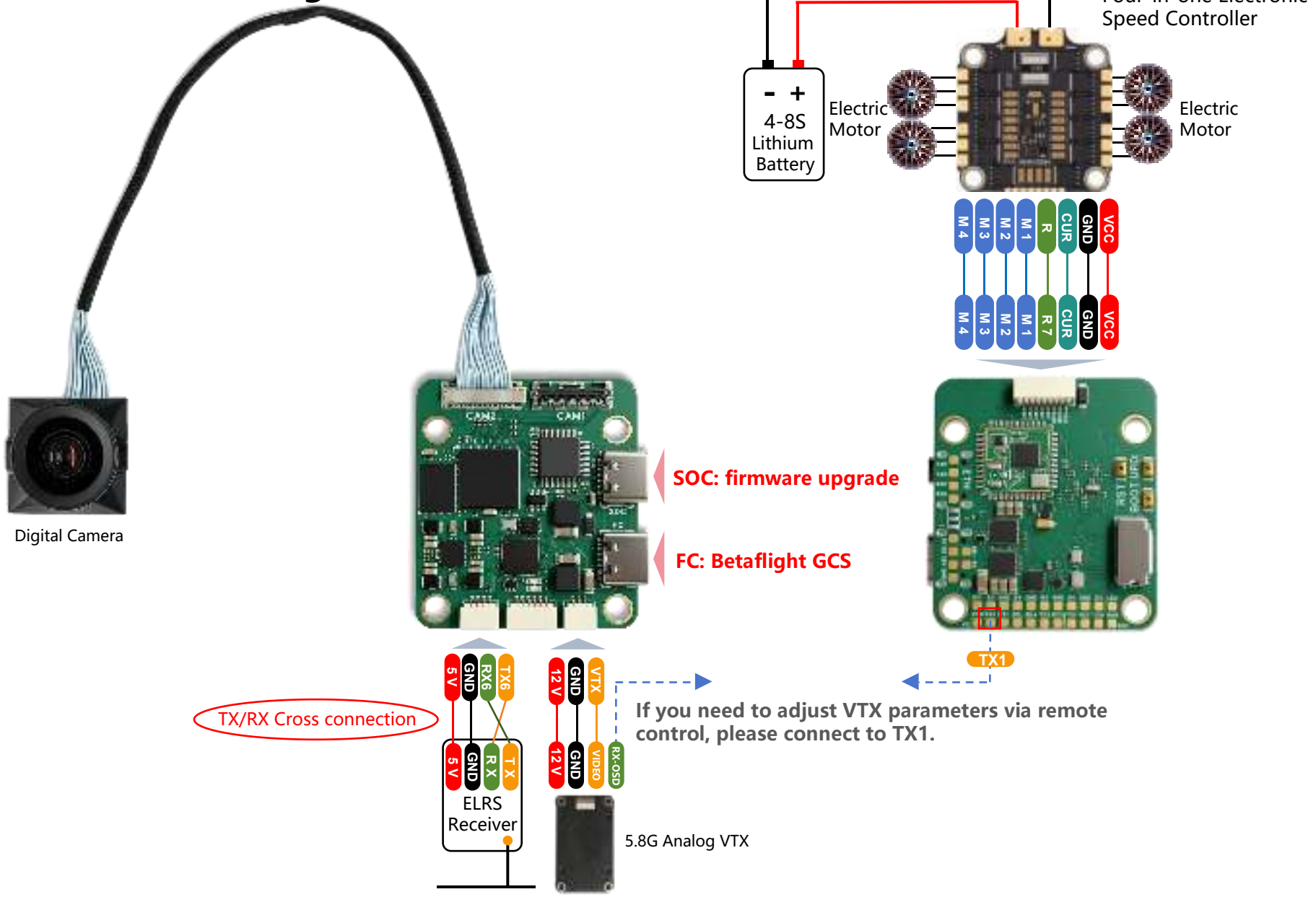
Digital Camera



PART 2

Circuit connection Diagram

2-Circuit connection Diagram



PART 3

Initial Setup & Calibration

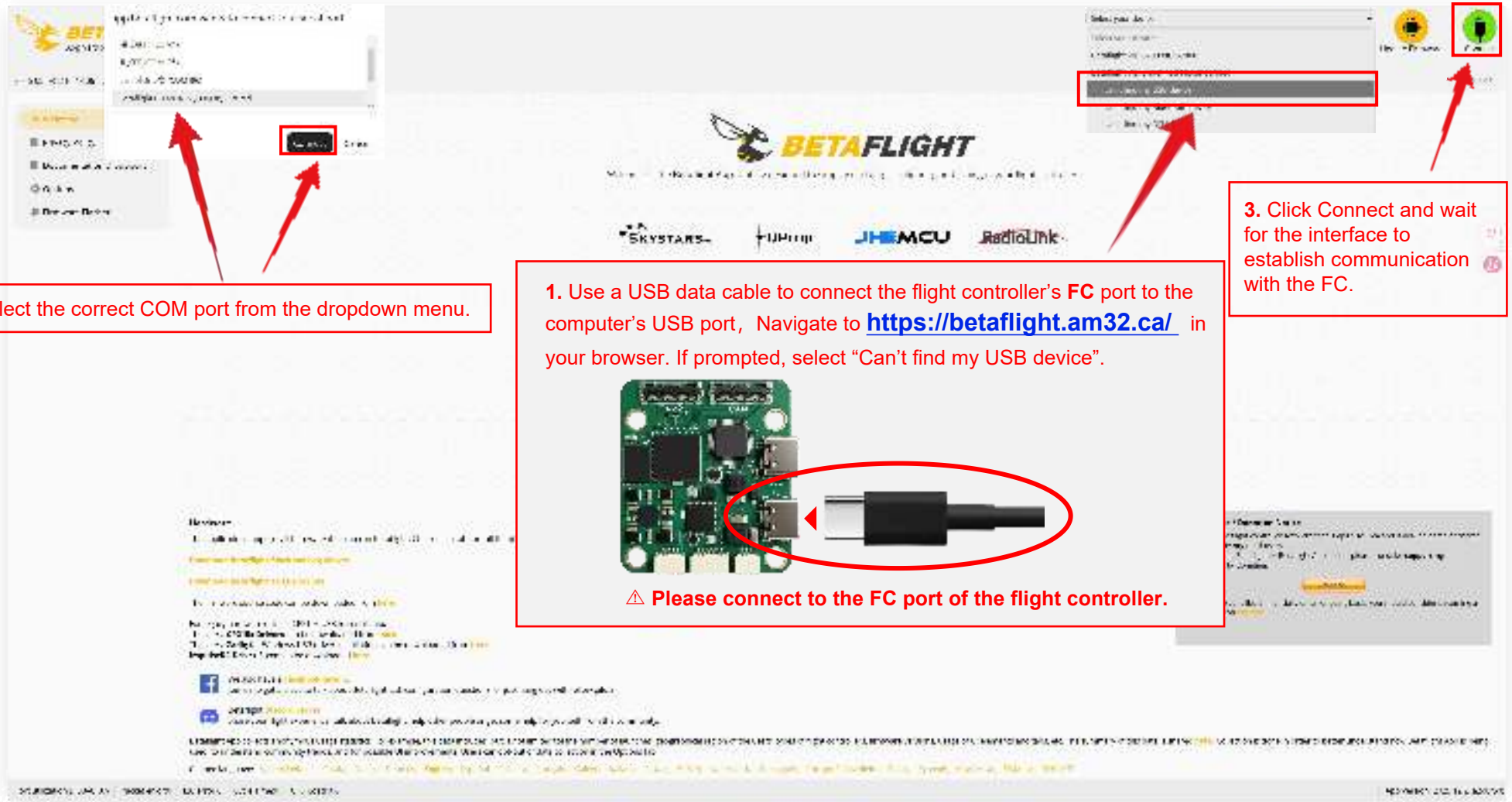
(using Betaflight GCS)

3-Initial Setup & Calibration (using Betaflight GCS)

Step 1: Connecting to the Configurator

- BF 4.6 firmware can only be configured via the official web-based ground station (**https://betaflight.am32.ca/**). It is recommended to use Chrome or Edge browsers. The traditional desktop Configurator is no longer supported.

⚠ Troubleshooting: If the flight controller (FC) fails to connect, please verify the following: You are using a USB data cable (not a charge-only cable). The FC is powered on.The correct USB drivers are installed.



2. Select the correct COM port from the dropdown menu.

1. Use a USB data cable to connect the flight controller's **FC** port to the computer's USB port， Navigate to **https://betaflight.am32.ca/** in your browser. If prompted, select "Can't find my USB device".

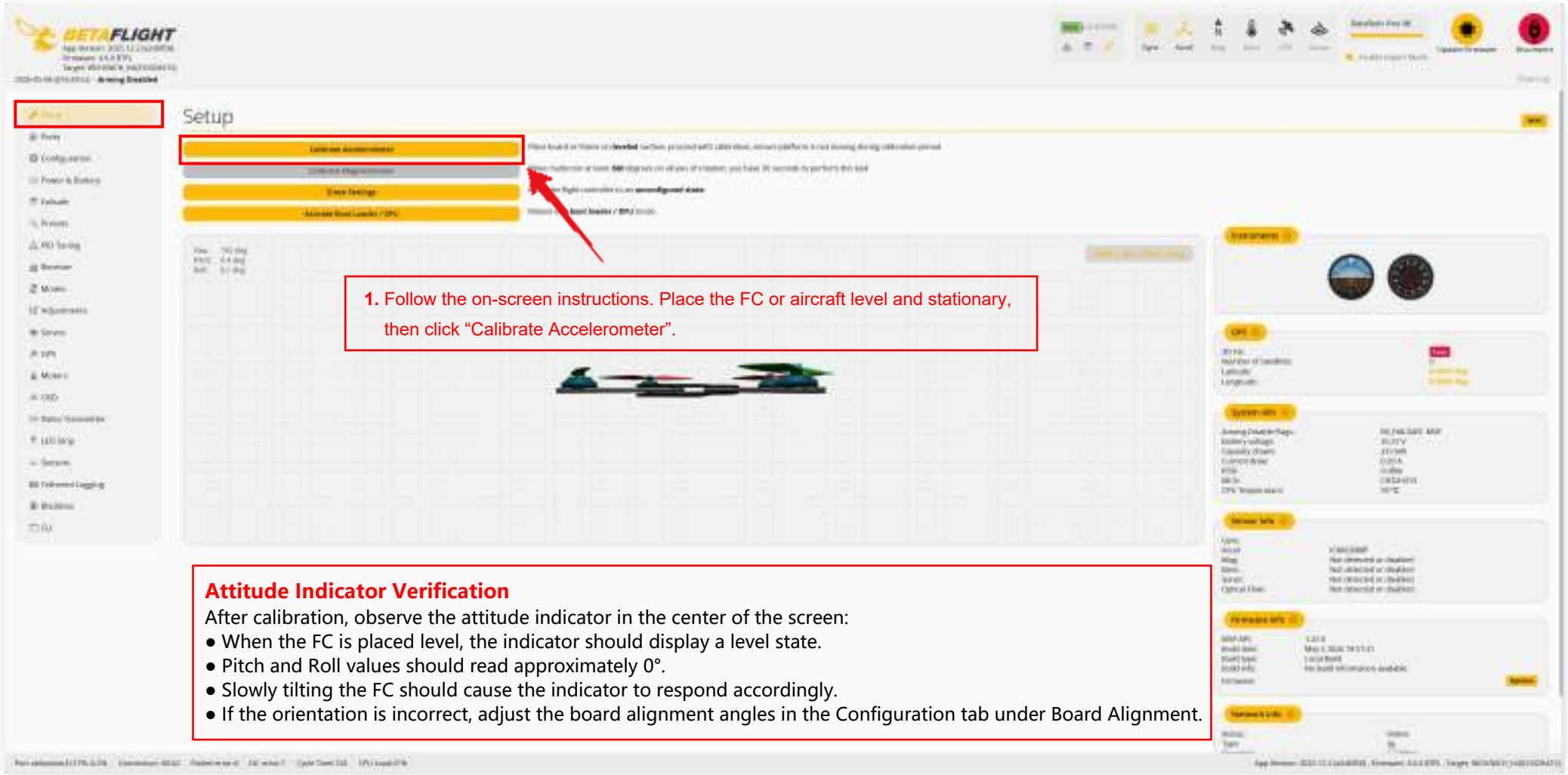
⚠ **Please connect to the FC port of the flight controller.**

3. Click Connect and wait for the interface to establish communication with the FC.

3-Initial Setup & Calibration (using Betaflight GCS)

Step 2: Setup

The Setup tab is the default landing page after connecting the flight controller (FC). It displays essential FC information, sensor statuses, and vehicle attitude.



Attitude Indicator Verification

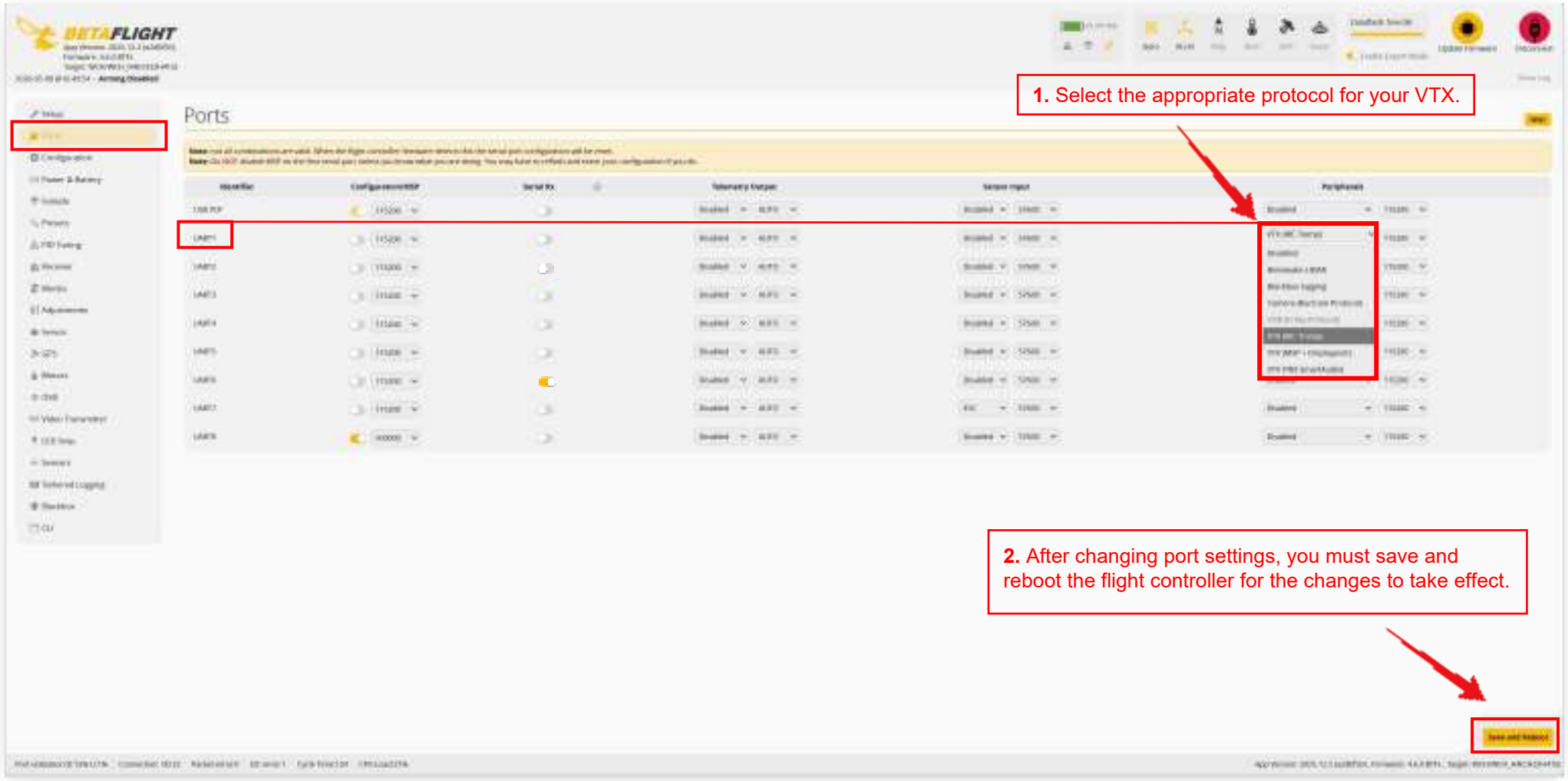
After calibration, observe the attitude indicator in the center of the screen:

- When the FC is placed level, the indicator should display a level state.
- Pitch and Roll values should read approximately 0°.
- Slowly tilting the FC should cause the indicator to respond accordingly.
- If the orientation is incorrect, adjust the board alignment angles in the Configuration tab under Board Alignment.

3-Initial Setup & Calibration (using Betaflight GCS)

Step 3: Ports

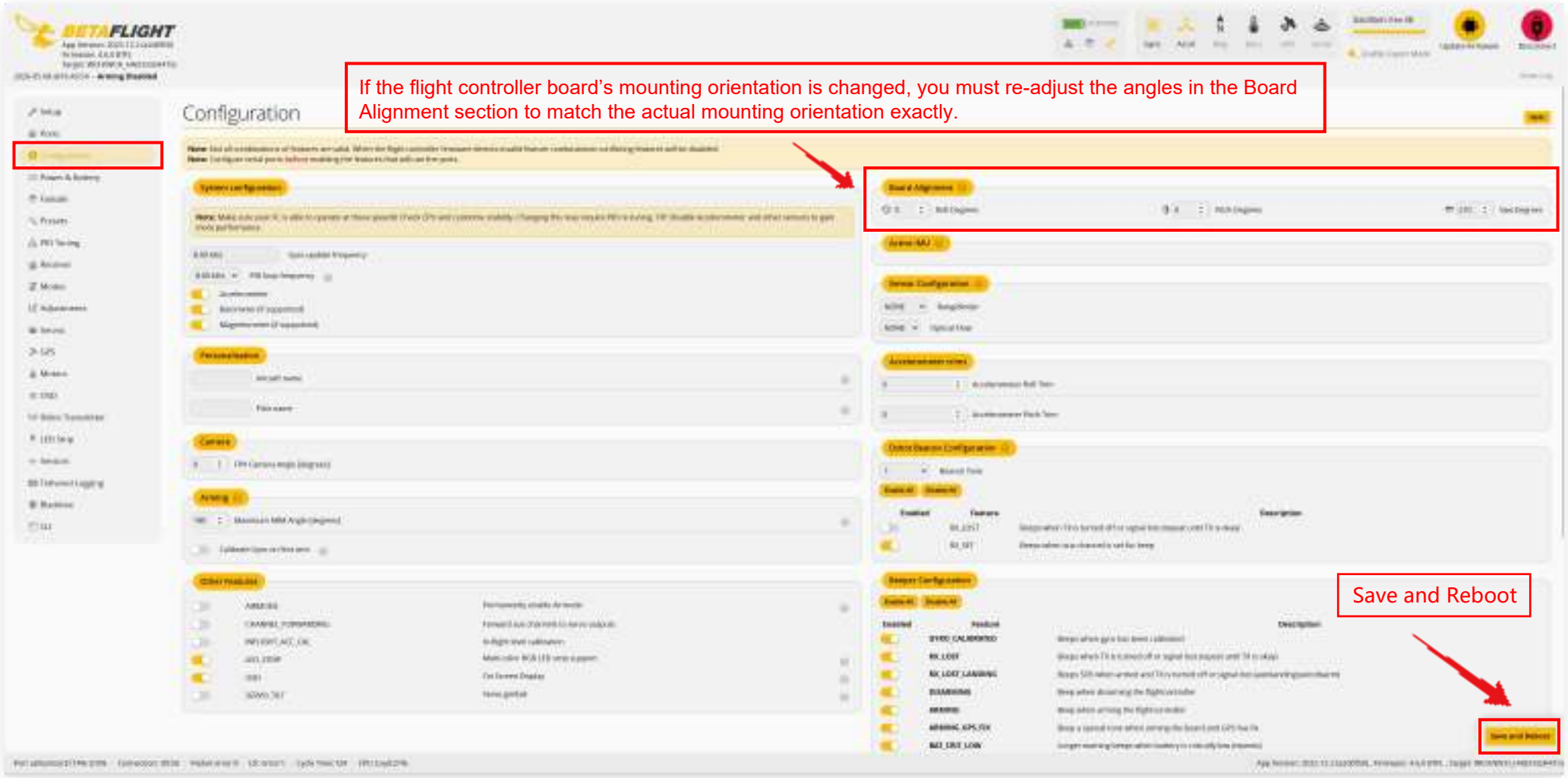
The Ports tab is used to configure the peripheral assignments for each UART on the flight controller. Proper port configuration is essential for your peripherals to function correctly.



3-Initial Setup & Calibration (using Betaflight GCS)

Step 4: Configuration

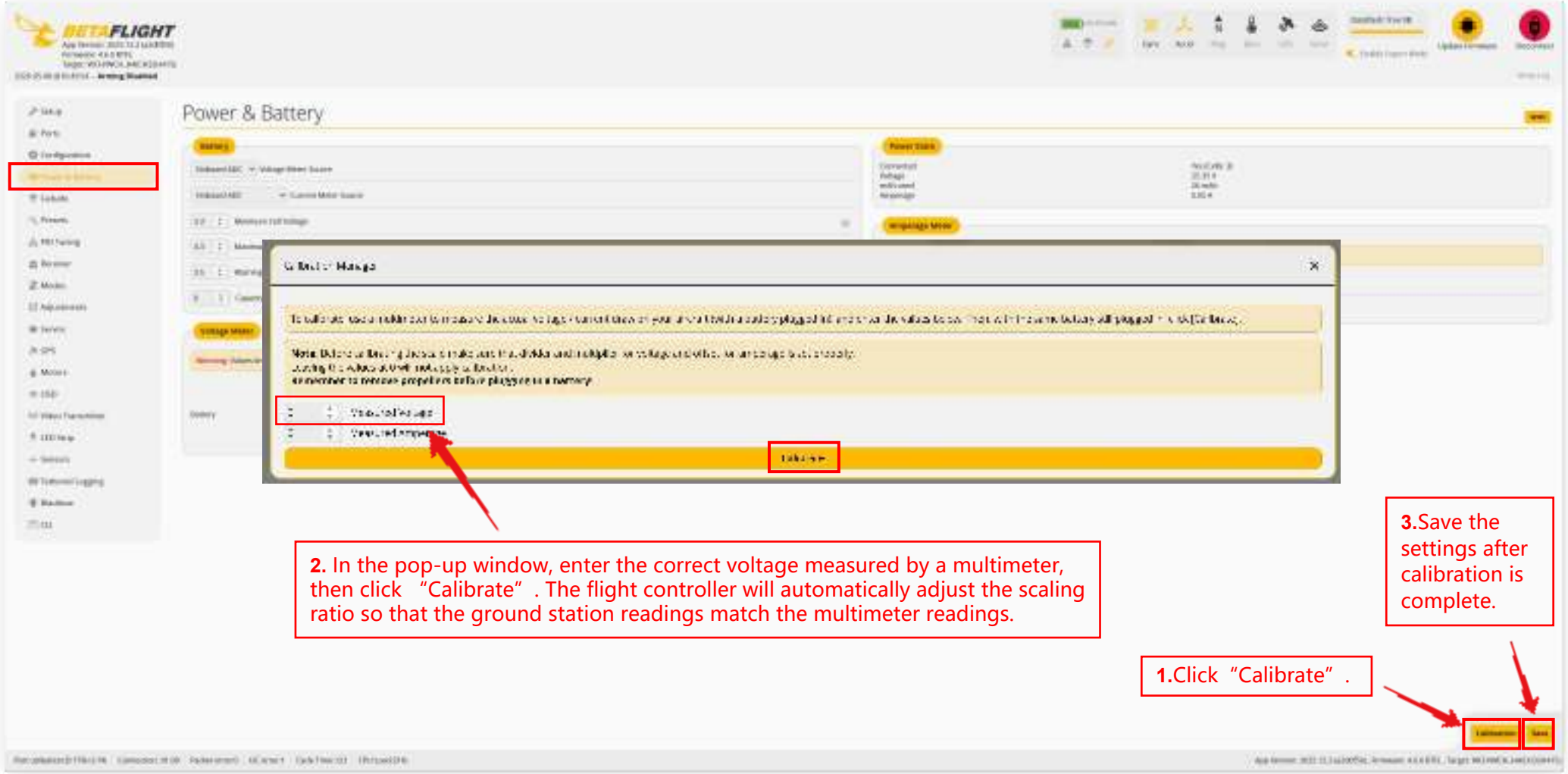
The Configuration tab contains the flight controller’ s core system settings, including PID loop frequency, feature switches, and customization options.



3-Initial Setup & Calibration (using Betaflight GCS)

Step 5: Power & Battery

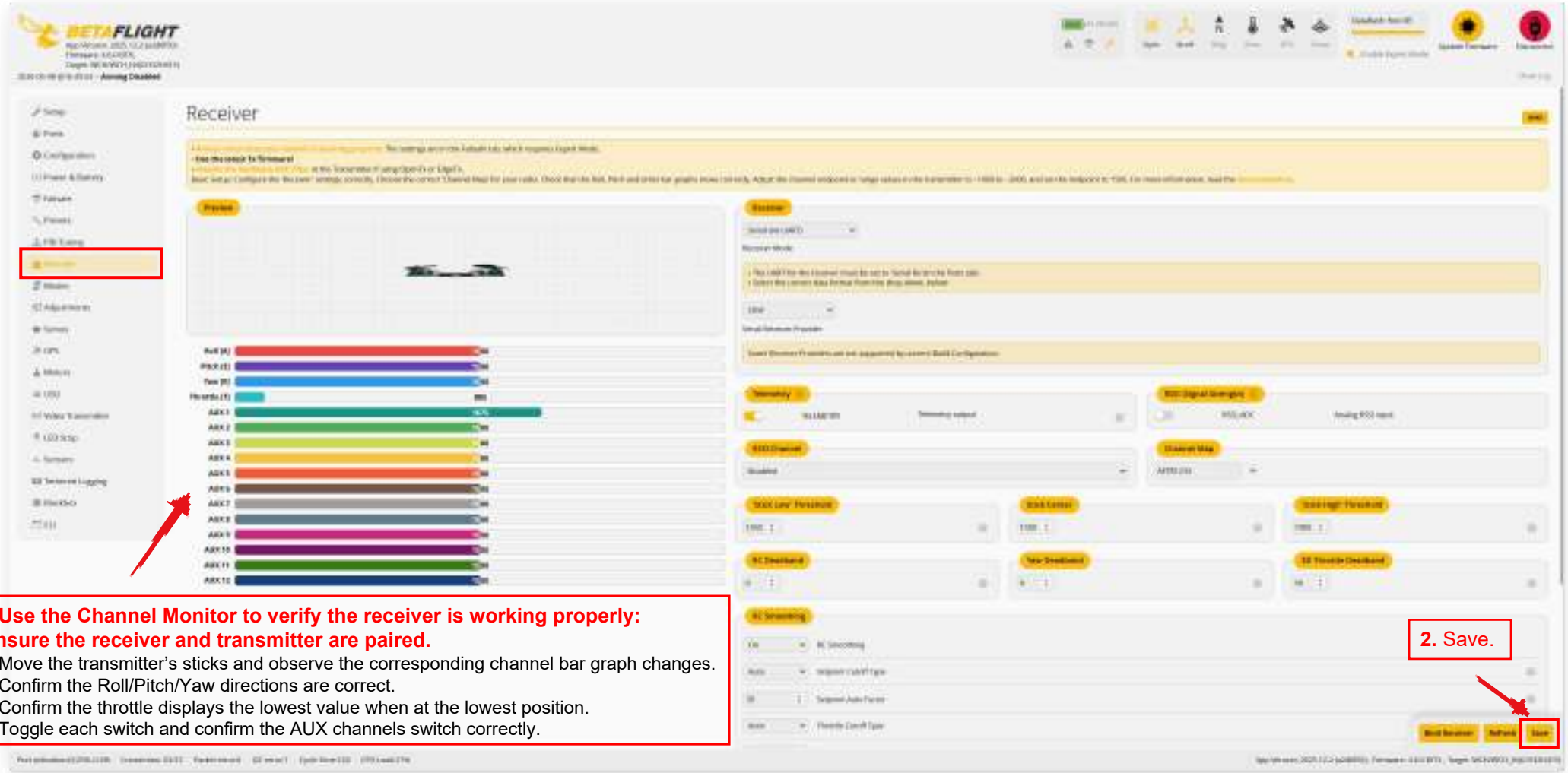
The Battery Calibration page is used to configure battery parameters, calibrate the voltage sensor, and set up the current sensor to ensure accurate and reliable battery readings.



3-Initial Setup & Calibration (using Betaflight GCS)

Step 6: Receiver

The Receiver tab is used to configure the receiver’ s protocol, channel mapping, and signal processing parameters.



1.Use the Channel Monitor to verify the receiver is working properly: Ensure the receiver and transmitter are paired.

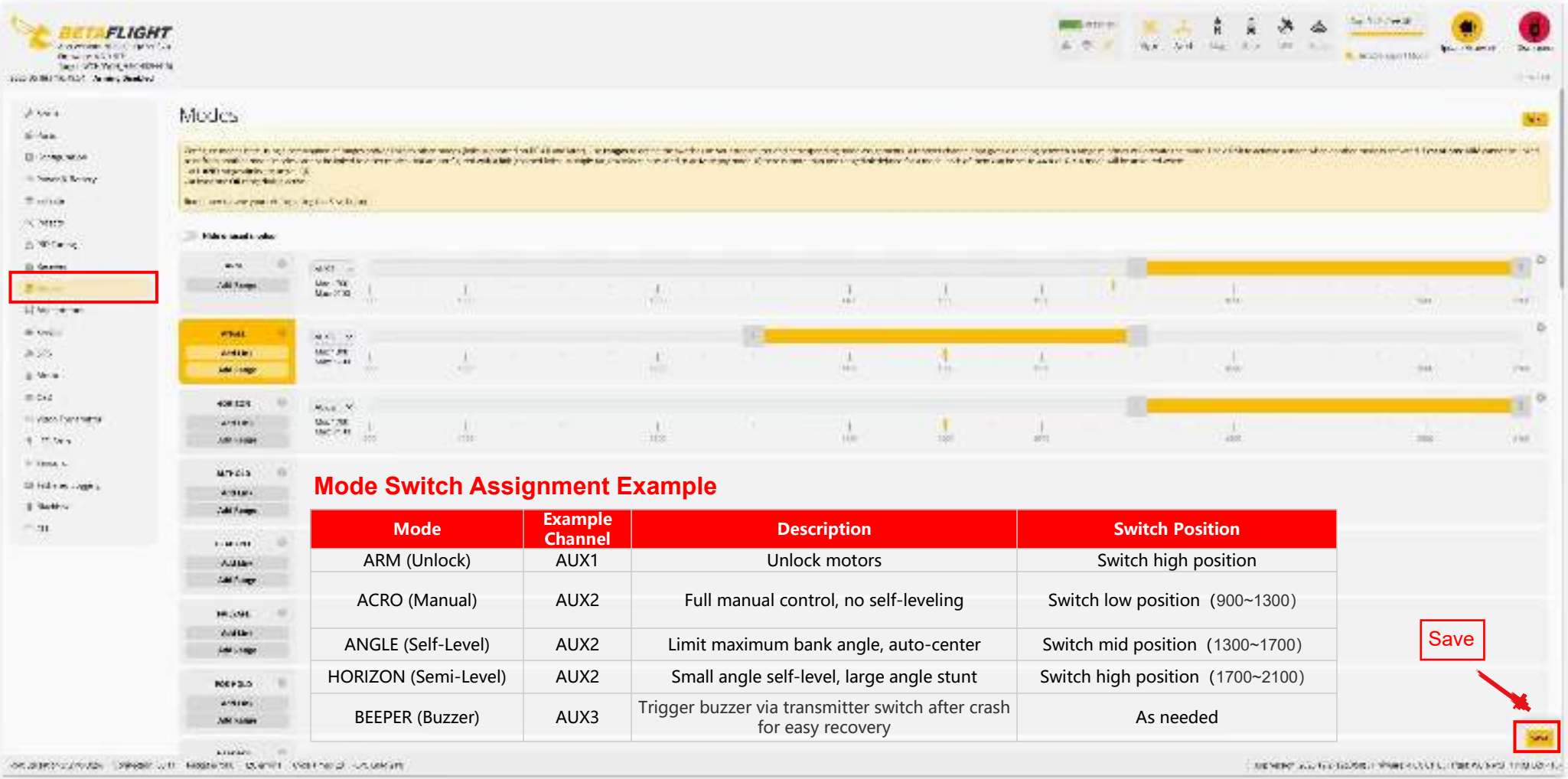
- Move the transmitter’s sticks and observe the corresponding channel bar graph changes.
- Confirm the Roll/Pitch/Yaw directions are correct.
- Confirm the throttle displays the lowest value when at the lowest position.
- Toggle each switch and confirm the AUX channels switch correctly.

3-Initial Setup & Calibration (using Betaflight GCS)

Step 7: Modes

The Modes tab is used to configure the channel assignments for flight mode switches. Properly configuring these switches allows for safer and more convenient flight.

Beginners are recommended to practice with ANGLE mode first, then switch to ACRO mode after becoming familiar with the controls. ANGLE mode limits the maximum bank angle (default 65 degrees), and the aircraft will automatically return to level when the sticks are released.



Mode Switch Assignment Example

Mode	Example Channel	Description	Switch Position
ARM (Unlock)	AUX1	Unlock motors	Switch high position
ACRO (Manual)	AUX2	Full manual control, no self-leveling	Switch low position (900~1300)
ANGLE (Self-Level)	AUX2	Limit maximum bank angle, auto-center	Switch mid position (1300~1700)
HORIZON (Semi-Level)	AUX2	Small angle self-level, large angle stunt	Switch high position (1700~2100)
BEEPER (Buzzer)	AUX3	Trigger buzzer via transmitter switch after crash for easy recovery	As needed

3-Initial Setup & Calibration (using Betaflight GCS)

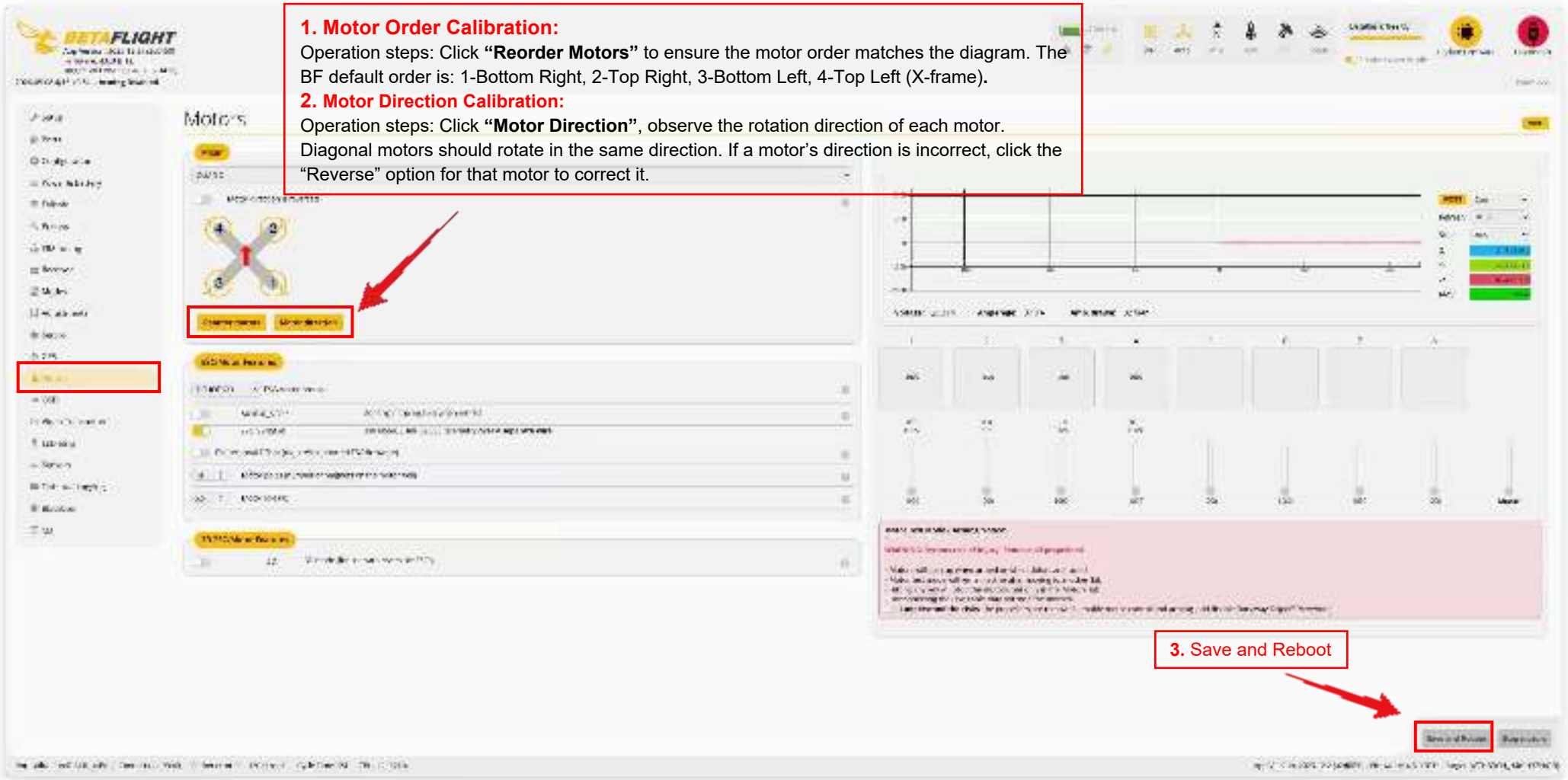
⚠ Before testing the motor order, be sure to remove all propellers! High - speed rotating propellers can cause serious injury!

Step 8: Motors

The Motors tab is used to configure motor mixing types, ESC protocols, test motor directions, etc. This is a critical step to ensure the aircraft flies properly.

1. Motor Order Calibration:
Operation steps: Click **"Reorder Motors"** to ensure the motor order matches the diagram. The BF default order is: 1-Bottom Right, 2-Top Right, 3-Bottom Left, 4-Top Left (X-frame).

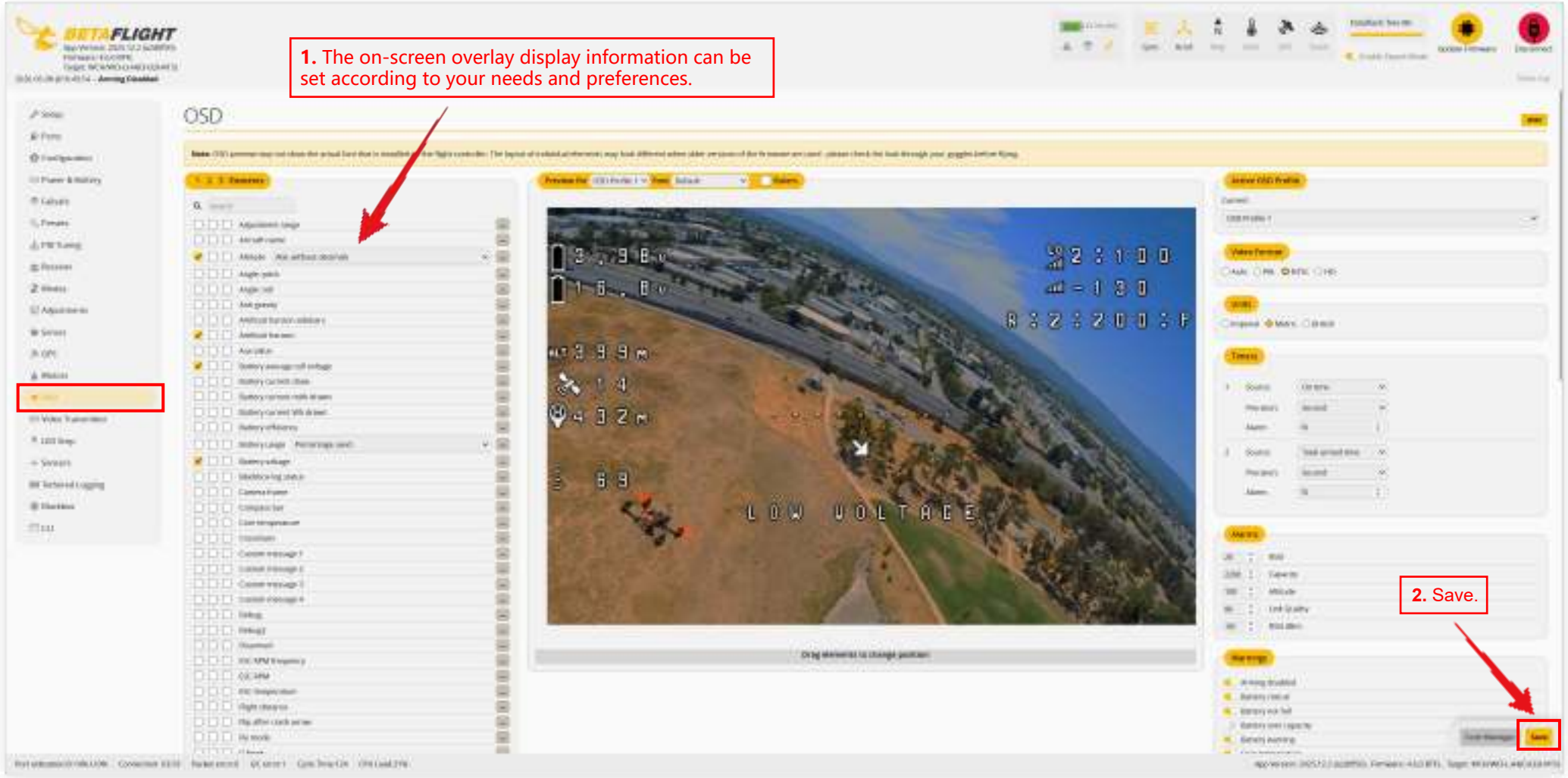
2. Motor Direction Calibration:
Operation steps: Click **"Motor Direction"**, observe the rotation direction of each motor. Diagonal motors should rotate in the same direction. If a motor's direction is incorrect, click the "Reverse" option for that motor to correct it.



3-Initial Setup & Calibration (using Betaflight GCS)

Step 9: OSD

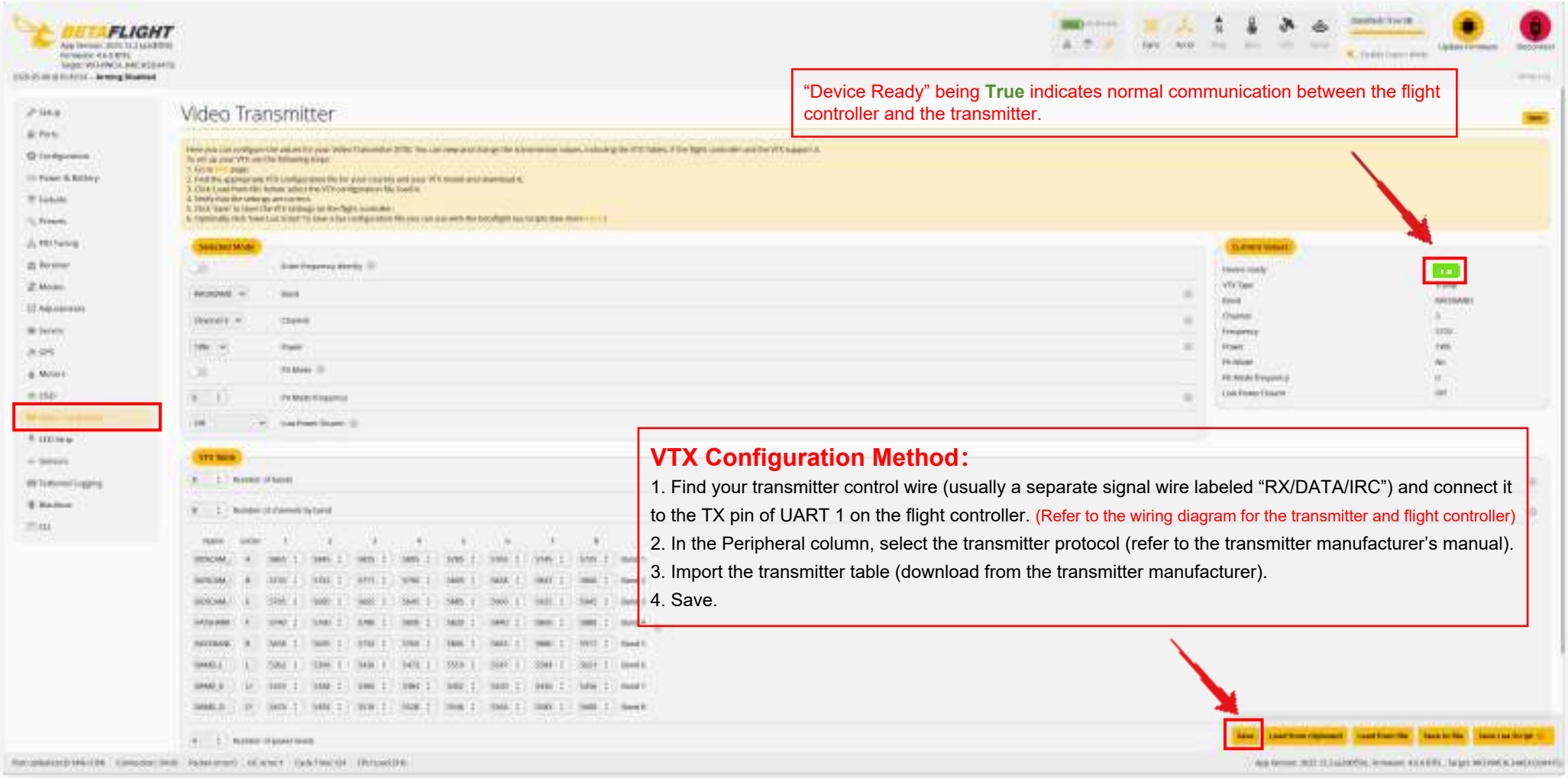
The OSD (On - Screen Display) page is used to configure the flight information displayed on the FPV screen.
A reasonable OSD configuration can provide key information during flight.



3-Initial Setup & Calibration (using Betaflight GCS)

Step 10: Video Transmission

The Video Transmission page is used to configure the FPV transmitter’ s band, channel, frequency, and power level. Proper VTX configuration ensures a clear and stable video feed.



PART 4

AI Mandatory Lock

*** Need to set remote control switch for AI mandatory Lock Function (CH10)**

4-Set remote control switch for AI Mandatory lock function (CH10)

*** Take Jumper T15Pro RC as example, other brands support self-defined setup.**

1. Enter menu

2. Select Model Setup

3. Click Mixer

4. Click "+" to add RC channel

5. Select Channel “CH10”

6. Toggle the switch to be mapped (take SA as input source)

7. Click Confirm to save and return

8. The lock switch (SA) is displayed in the list, channel setup completed successfully.

4-AI Mandatory Lock Operation Diagram (any kind of targets,moving & Stationary.)

1

Aim the crosshair at the target

2

Align with the target

3

Push the CH10 switch down to enter hard lock mode

4

A green hard lock box appears

5

Release both hands

6

Hit the target

4-AI Mandatory Lock (any kind of targets,moving & Stationary.)

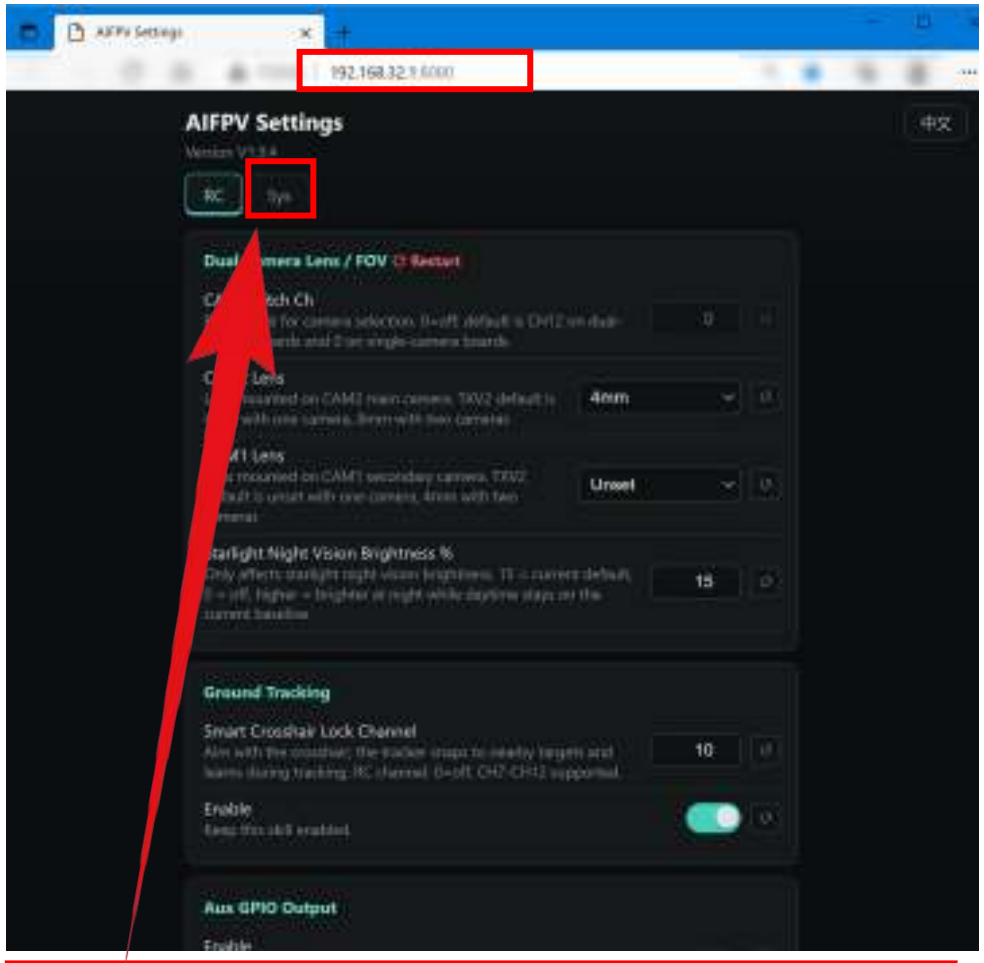
PART 5

Firmware Upgrade

URL: 192.168.32.1:8080/

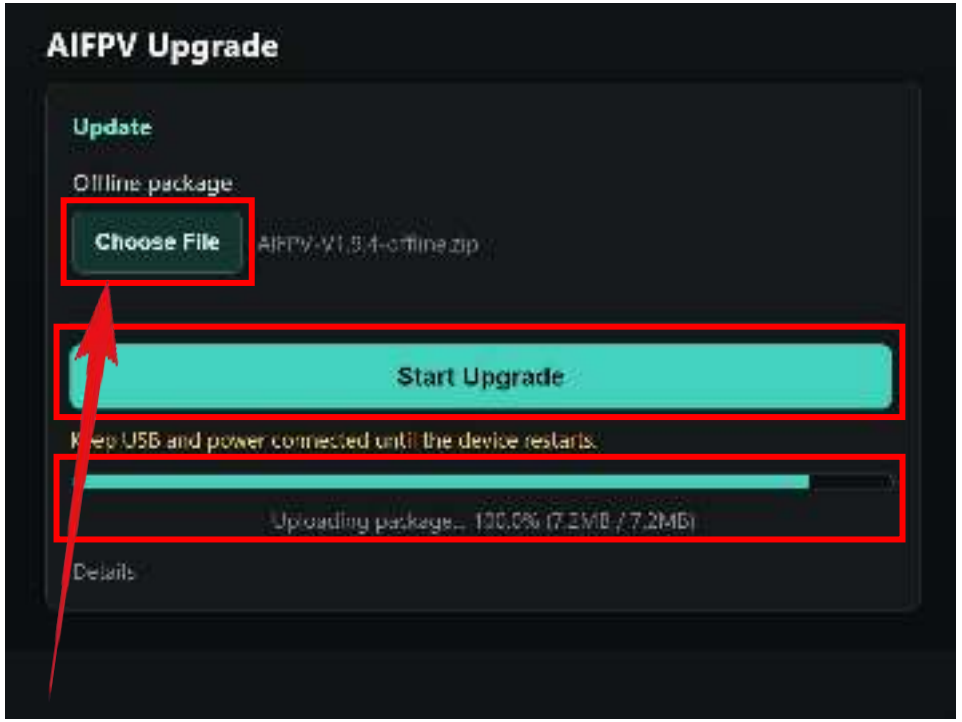
5-1 Firmware Upgrade Diagram

192.168.32.1:8080/



1. Connect the flight controller's **SOC** port to the computer with a USB data cable.
2. Open the URL http://192.168.32.1:8080/ on your computer and select **"Sys"**

⚠ **Please connect to the SOC port of the flight controller.**

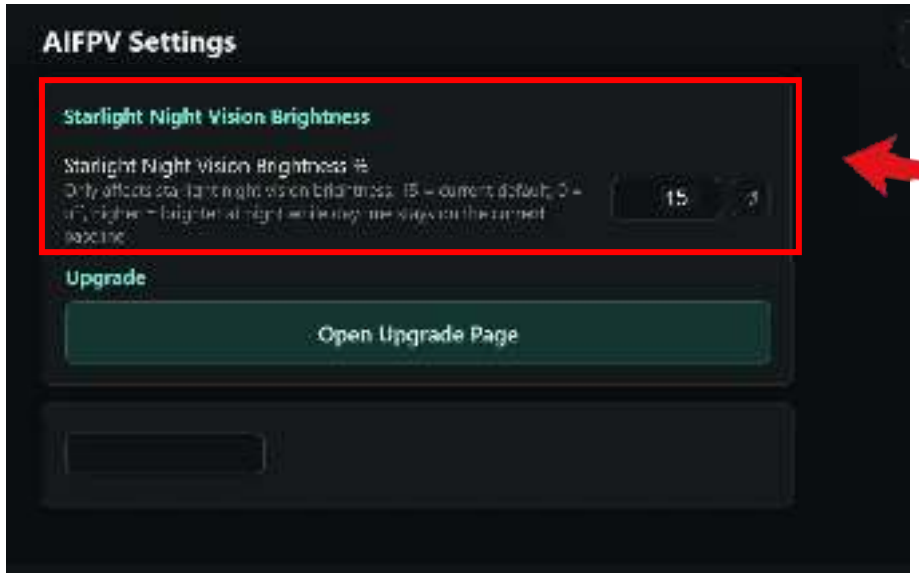


3. Click **"Choose File"** to upload the latest firmware package.
4. Click **"Start Upgrade"**.
5. Wait for the progress bar to finish, then the upgrade is completed.

5-2 Additional functions

⚠ Please connect to the SOC port of the flight controller.

192.168.32.1:8080/



Adjustable night vision brightness for night flight

PART 6

Troubleshooting

6-Troubleshooting

Below are some common problems and their solutions.

Problem Phenomenon	Possible Reasons	Solutions
Cannot connect to ground station	USB cable is not a data cable or not compatible	Replace USB data cable
Cannot connect to ground station	Port is occupied	Close other serial port software
Receiver has no signal	Protocol selection is incorrect	Select the correct protocol on the receiver page
Receiver has no signal	UART port configuration is incorrect	Check port configuration
Channel direction is reversed	Channel mapping is incorrect	Adjust channel mapping on the receiver page
Motor does not rotate	ESC protocol is mismatched	Set to DSHOT 300/600
Motor direction is reversed	Wiring error	Check “reverse” in the motor direction page
OSD does not display	Video format is mismatched	Set to automatic or match the VTX format
OSD does not display	OSD is not enabled	Enable OSD in the configuration page
VTX cannot be controlled	Tuning wire is not soldered or connected incorrectly	Solder the tuning wire to the corresponding serial port TX pin
VTX cannot be controlled	UART port is not configured with the corresponding protocol	Configure VTX Tramp on the port page
Battery voltage is inaccurate	Voltage meter is not calibrated	Calibrate the voltage meter with a multimeter
Unlock fails	Safety conditions are not met	Check if the throttle is at the lowest position