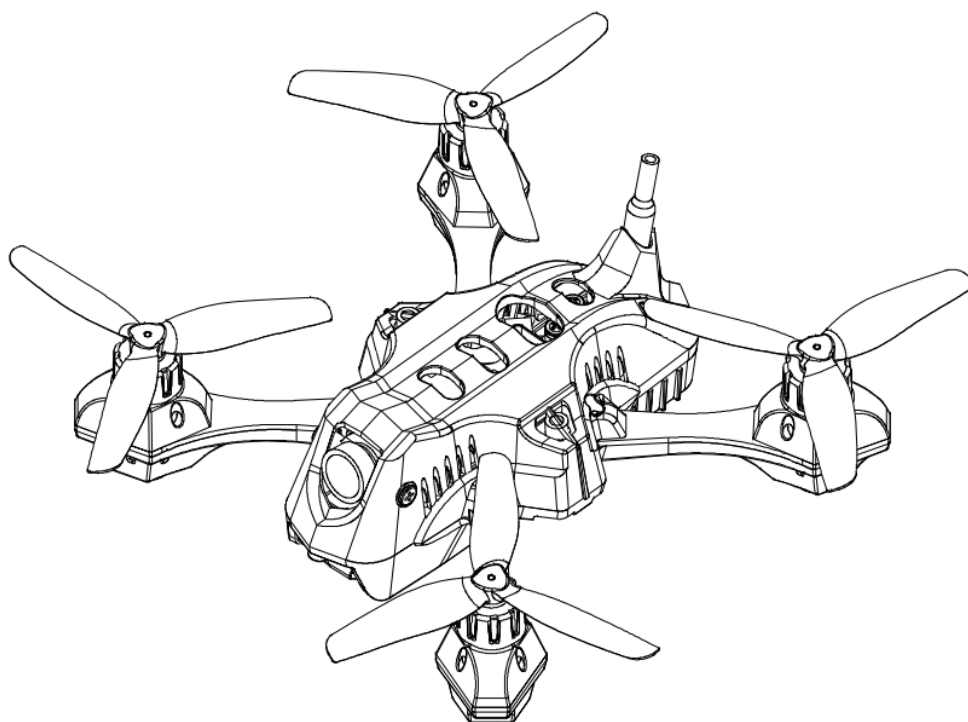


TINY LITE **Hawk** **Adventure**



in China.

Thank you for choosing the Tinyhawk Lite Adventure. Designed in California, USA. Manufactured

Tinyhawk Lite Adventure

Welcome to Tinyhawk Lite Adventure.

Tinyhawk Lite Adventure is designed to give you a real FPV flight experience in a compact, lightweight format. It is responsive, direct, and built for pilots who want full control.

Think of it like driving a manual sports car. It does not do everything for you, and that is the point. Your throttle, steering, timing, and judgment all matter. The more you practice, the more control you gain.

At first, FPV flight can feel challenging. You may overcorrect, lose orientation, or crash while learning. That is normal. Each flight helps you understand the controls, sharpen your reactions, and build smoother flying habits.

Before flying, read this manual carefully. Learn the controls, follow the safety instructions, and take your time with each step.

Tinyhawk Lite Adventure rewards practice, patience, and precision.

Prepare carefully, fly responsibly, and enjoy the flight.

Disclaimer

1. Please read this disclaimer carefully before using this product.
2. By using this product, you agree to this disclaimer and confirm that you have carefully read the product information.
3. This product is not suitable for anyone under 14 years of age. Adult supervision is strongly recommended for users under 14.
4. Please read the instruction manual and all warnings carefully.
5. The Tinyhawk Lite Adventure is equipped with an open-source flight controller and electronic speed-control system for FPV users who want upgradeable quadcopter performance.
6. EMAX is not responsible for any damage or injury caused directly or indirectly by the use of this product.

Precautions

1. Assemble and operate this product correctly according to the instructions.
2. Before each flight, make sure the battery is sufficiently charged and all equipment connections are secure.
3. Fly only in a safe area away from people, animals, and surrounding objects.
4. Do not use this product in areas with strong electromagnetic interference.
5. Do not use this product in harsh weather or conditions such as wind, rain, lightning, or snow.
6. Do not use this product if you have a physical or mental condition, feel dizzy or fatigued, or are under the influence of alcohol or medication.
7. Follow all local laws and regulations and fly safely.
8. Do not modify this product or use unapproved EMAX parts or accessories.

Recommended Reading:

EMAX provides the following documents:

1. Tinyhawk Lite Adventure Quick Start Guide
2. Tinyhawk Lite Adventure User Manual

We recommend reading the Tinyhawk Lite Adventure Quick Start Guide first to learn the basic operating process.

For detailed product information, please read the Tinyhawk Lite Adventure User Manual.

Support

Tinyhawk Lite Adventure

Please visit emax-usa.com or emaxmodel.com for updates and technical support.

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Tinyhawk Lite Adventure - RTF Product Specifications

Aircraft Model: Tinyhawk Lite Adventure	
Wheelbase	115mm
Maximum Dimensions	LxWxH=148x144x45mm
Weight	Approx. 59 g (without battery cartridge)
Motor	1020 coreless motor, DC 3.7 V
Propellers	65 mm three-blade propellers
Main Control Board	STM32F411 (100 MHz) MCU, 1S input voltage, onboard ELRS (2.4 GHz) receiver (SPI communication)
Camera	E02
VTX	32-bit 40-channel open-source VTX Power: 0/25 mW/100 mW/400 mW
Battery Cartridge	1S HV 850mAh
Transmitter Model: E8 Transmitter (ELRS 2.4 GHz)	
Maximum Dimensions	LxWxH=150x140x45mm
Weight	Approx. 260 g (without battery)
Number of Channels	8 channels
Protocol	ELRS 2.4 GHz protocol
Operating Frequency	2.4 GHz band (2400-2483.5 MHz)
Power	10mW/25mW/50mW/100mW
Battery	Built-in 18650 Li-ion battery
Charging System	Built-in USB 1 A linear Li-ion charging system
Operating Voltage	3.7-4.2V
External Ports	Type-C port, 3.5 mm audio port (wired trainer port)
Other	Supports simulator use, stick calibration, left/right-hand mode switching, firmware updates via USB, adjustable power, adjustable transmit/telemetry rates, and binding-phrase changes
FPV Goggles Model: Transporter II	
Maximum Dimensions	LxWxH=155x100x90mm
Weight	Approx. 398 g (including head strap and antennas)
Screen Resolution	480x272
Display Size	4.3 inches
Battery	Built-in 1300 mAh Li-ion battery
Voltage	3.3V-4.2V
Operating Frequency	5.8 GHz band (5658-5945 MHz)

Charging System	Built-in USB 1 A linear Li-ion charging system
External Ports	Type-C port, external mount port

Tinyhawk Lite Adventure - RTF Package Contents

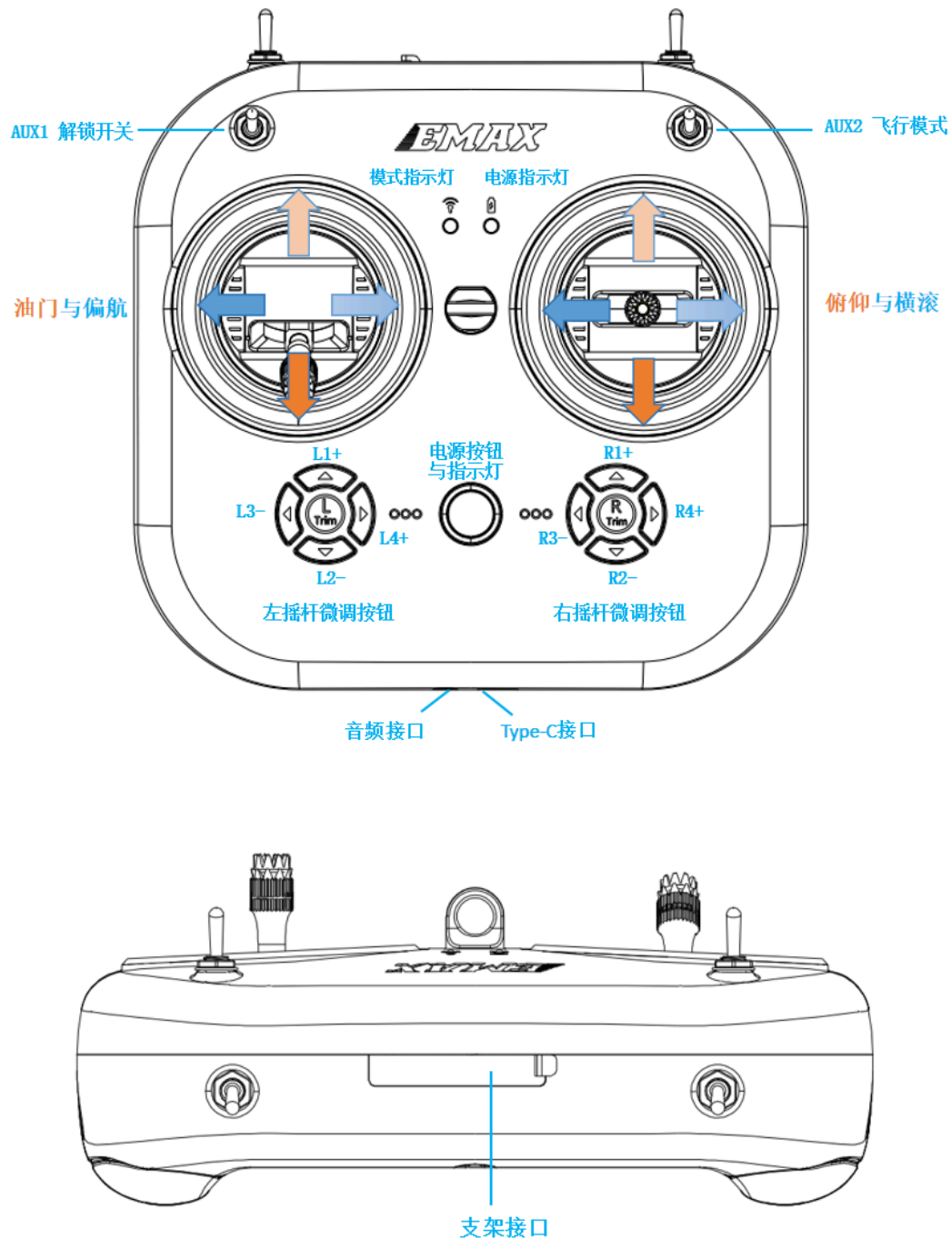
1. Tinyhawk Lite Adventure - x1
2. EMAX E8 Transmitter (ELRS 2.4 GHz) - x1
3. EMAX Transporter II (No DVR) - x1
4. 1S HV 850 mAh Battery Cartridge - x1
5. Accessory Pack (includes charger, propeller remover, etc.) - x1
6. Screw Accessory Pack - x1
7. EM2.0 Accessory Pack - x1
8. Propeller Accessory Pack - 2 x CW, 2 x CCW
9. Antenna Card Accessory Pack (includes antennas, etc.) - x1
10. Stick Accessory Pack - x1

Tinyhawk Lite Adventure - BNF Package Contents

1. Tinyhawk Lite Adventure - x1
2. 1S HV 850 mAh Battery Cartridge - x1
3. Charger - x1
3. Screw Accessory Pack - x1
4. EM2.0 Accessory Pack - x1
5. Propeller Accessory Pack - 2 x CW, 2 x CCW
6. Card inserts, etc. - x1

1. E8 Transmitter (ELRS 2.4 GHz)

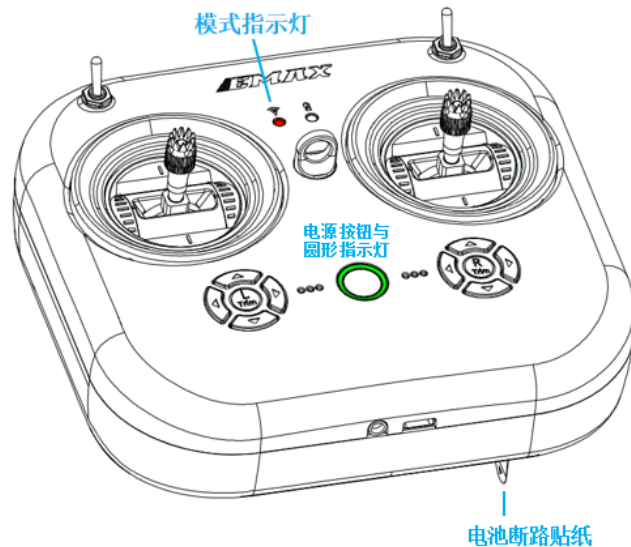
1.1 E8 Transmitter (ELRS 2.4 GHz) Diagram



1.2 E8 Transmitter (ELRS 2.4 GHz) Operation

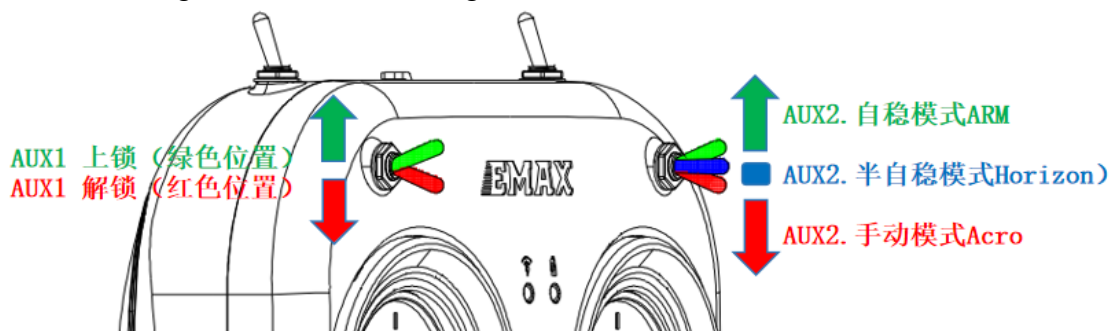
1.2.1 First Use

Before first use, pull out the battery isolation tab. Then press and hold the power button until you hear one beep. The mode indicator will stay red, and the round power-button indicator will stay green. The transmitter is now powered on.



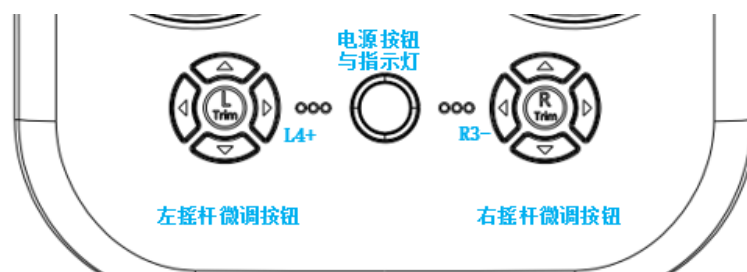
1.2.2 Button Functions

- ◆ Power button: Powers on the transmitter and enters ELRS protocol mode. The mode indicator stays red.
- ◆ L4+ and R3- pressed together: Enters binding mode (see 1.2.3).
- ◆ Power button and L3- pressed together: Powers on and enters calibration mode (see 1.2.5).
- ◆ With the transmitter off, hold R4+ and then press the power button: Enters serial flashing mode (see 1.3).
- ◆ AUX1 arm switch: lock/disarm and unlock/arm.
- ◆ AUX2 flight mode switch: Angle Mode, Horizon Mode, and Acro Mode.



1.2.3 Binding

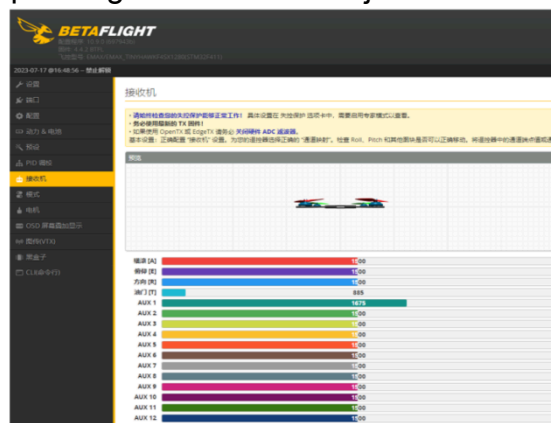
To put the transmitter into binding mode, power it on first. Then press and hold the L4+ and R3- buttons together for 1 second until a beep sounds. The center round indicator will flash green and red alternately, indicating that the transmitter has entered binding mode.



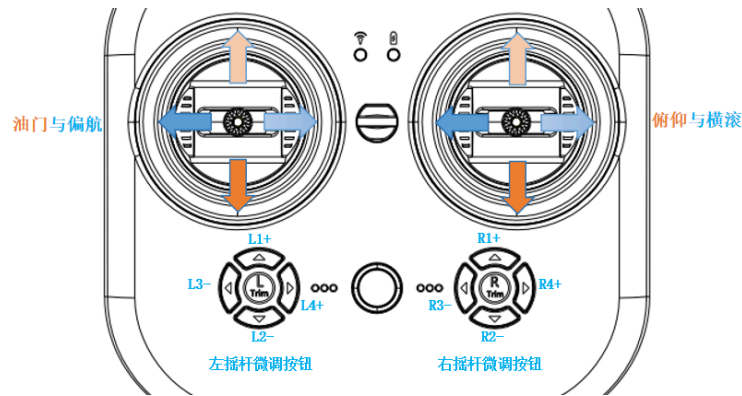
1.2.4 Trim Adjustment

Each stick has corresponding trim buttons. Each trim button adjusts the direction controlled by that stick. A tone sounds with each adjustment, and a longer tone sounds when the trim reaches center. When the stick values are centered, the aircraft can hold a stable hover. Use the following procedure:

(1) Connect to Betaflight Configurator. Select the Receiver menu and check the yaw, pitch, and roll values. If a stick value is not centered at 1500, hold the corresponding trim button to adjust it.

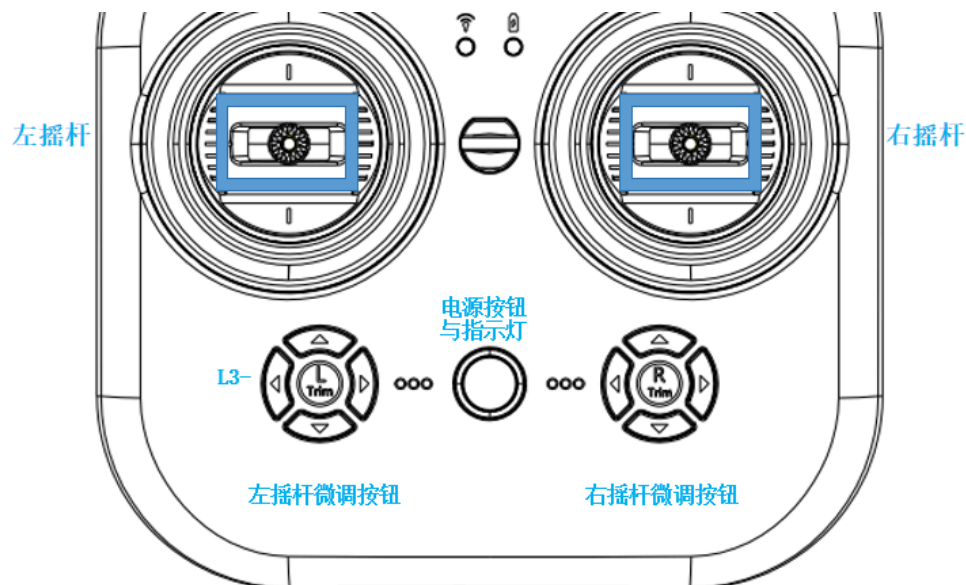


(2) L3- decreases yaw, and L4+ increases yaw. R1+ increases pitch, and R2- decreases pitch. R3- decreases roll, and R4+ increases roll.



1.2.5 Stick Calibration

The transmitter is calibrated at the factory, but recalibration can help resolve some issues. With the transmitter off, press L3- and the power button at the same time to turn it on. Wait until the center round indicator turns on and changes from fast flashing to slow flashing. Move both sticks through their full range in all four directions: up, down, left, and right. Press L3- again. A tone will sound, calibration mode will exit, and the transmitter will enter normal powered-on mode.



1.2.6 Gimbal Adjustment

Remove the screws from the transmitter rear cover and open the rear shell to adjust stick tension, as shown:

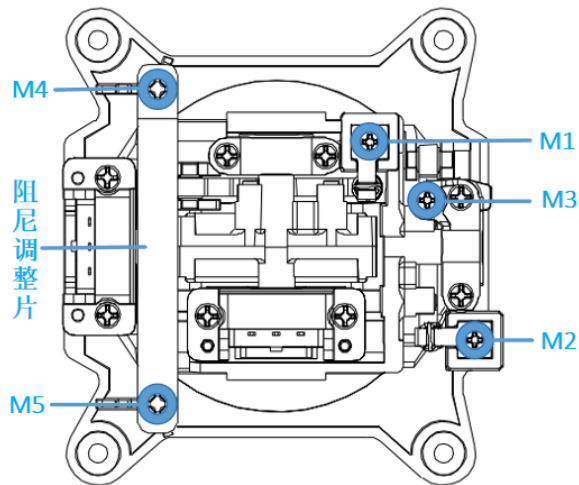
M1 screw: Adjusts left/right stick tension.

M2 screw: Adjusts up/down stick tension.

M3 screw: Switches between left-hand and right-hand throttle modes (Mode 2 and Mode 1).

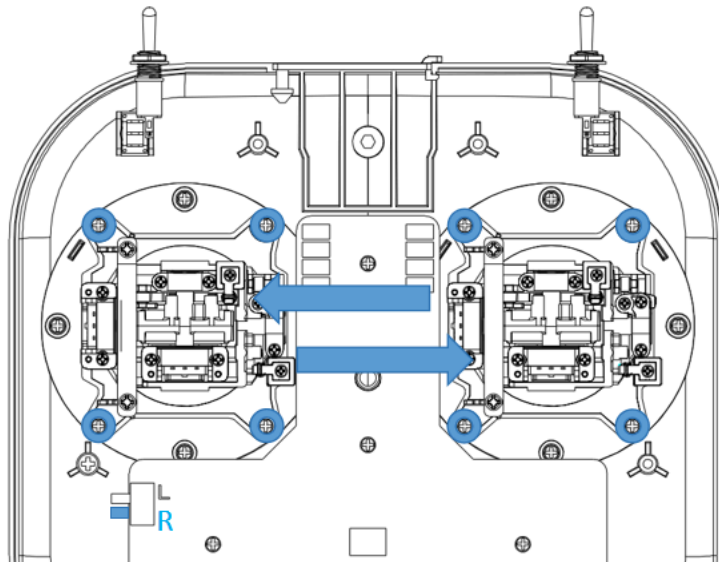
M4 and M5 screws: Adjust throttle stick damping.

Note: When adjusting the screws, do not exceed their limits or the gimbal may be damaged.



1.2.7 Left/Right-Hand Mode Switching

The transmitter is set to left-hand throttle mode by default. To switch to right-hand throttle mode, remove the screws from the rear cover and open the transmitter rear shell. A slide switch is located on the left side of the main board. Move it to "L" for left-hand throttle mode or "R" for right-hand throttle mode. Remove the gimbal mounting screws and swap the two gimbal assemblies. Note: The 6-pin cables connecting the gimbals to the main board do not need to be moved.



You may also leave the gimbals in their original positions. Refer to section 1.2.6, adjust the M3 screw to switch to right-hand mode, and adjust the M4 and M5 screws to change throttle stick damping.

Note: Apply grease where the damping plate contacts the gimbal.

1.2.8 Flight Controls

Left-hand throttle mode:

Left stick: controls throttle and yaw.

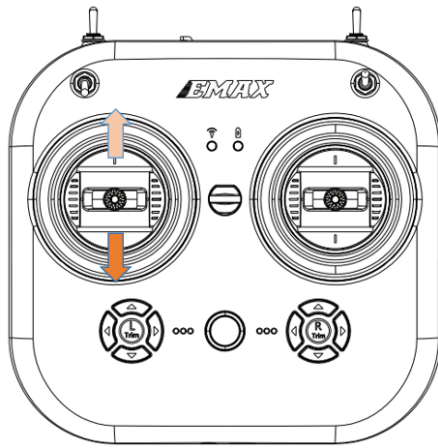
Right stick: controls pitch and roll.

Right-hand throttle mode:

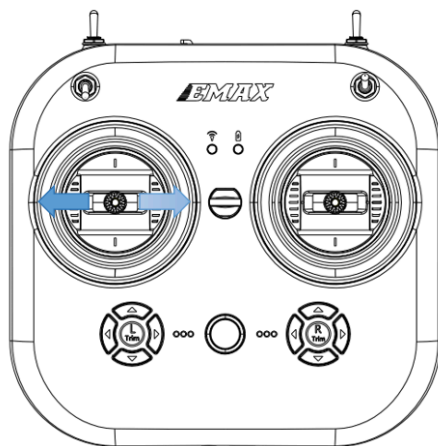
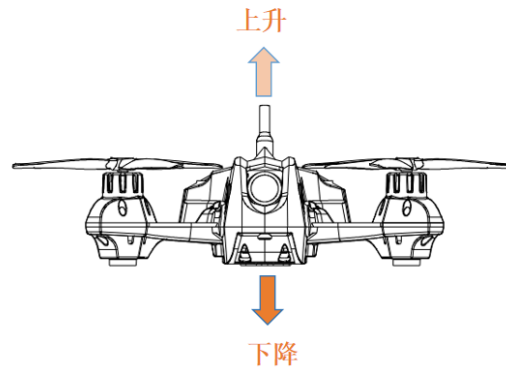
Left stick: controls pitch and roll.

Right stick: controls throttle and yaw.

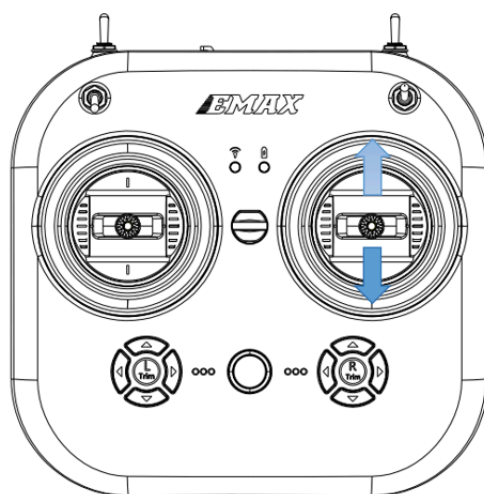
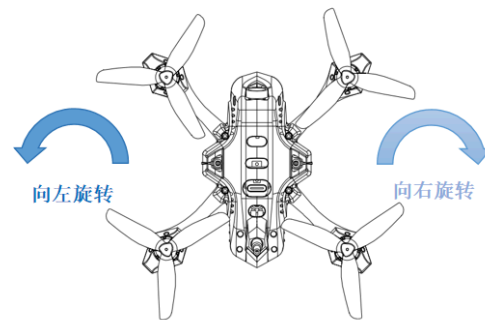
Left-hand stick diagram (shown in left-hand mode; controls are reversed in right-hand mode)



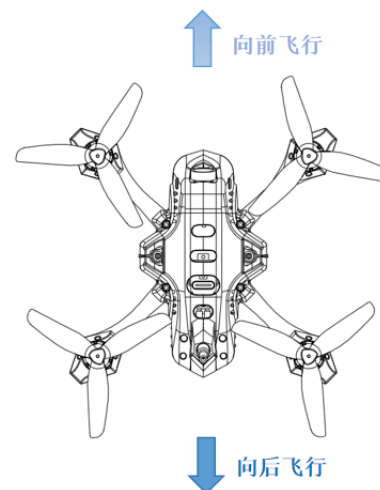
油门摇杆向上/向下

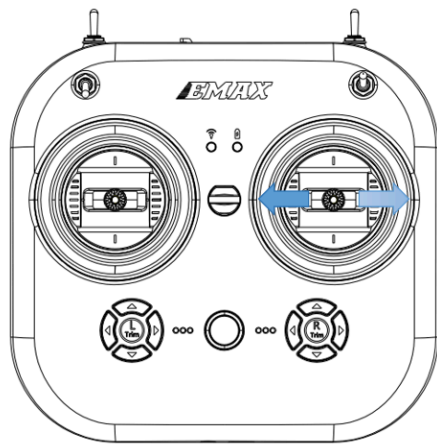


偏航摇杆 向左/向右

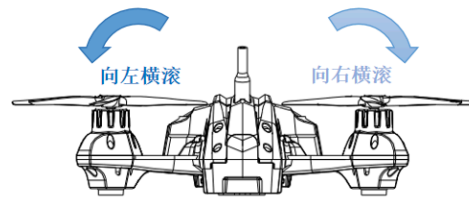


俯仰摇杆 向上/向下



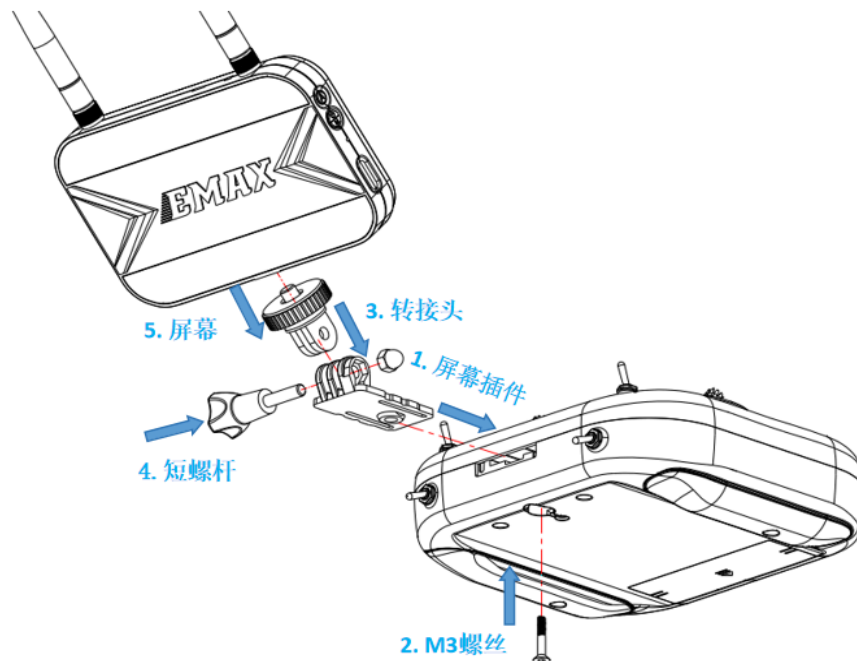


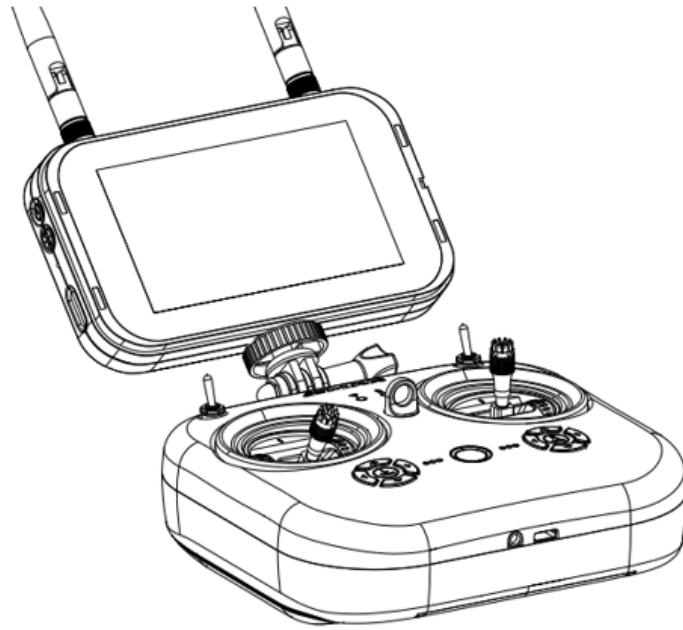
横滚摇杆 向左/向右



1.2.9 FPV Monitor Mode (Goggle Screen Mounted on Transmitter)

Mount the goggle screen on the transmitter so you can watch the screen while also keeping visual awareness of the drone. Choose this setup if you are prone to motion sickness, wear glasses, are new to flying, or feel uncomfortable using the full goggle shell. It is more beginner-friendly, as shown below.

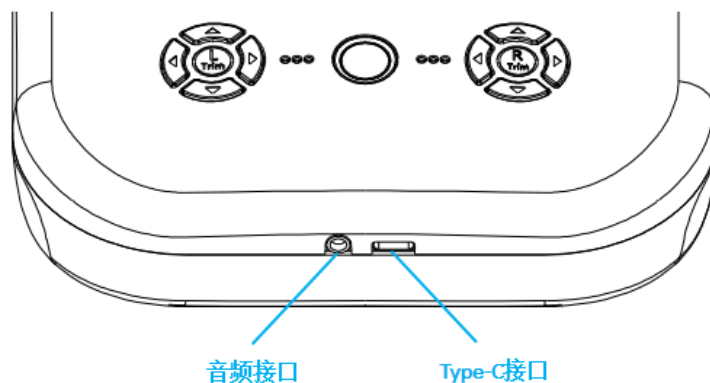




1.2.10 Trainer Port and Simulator

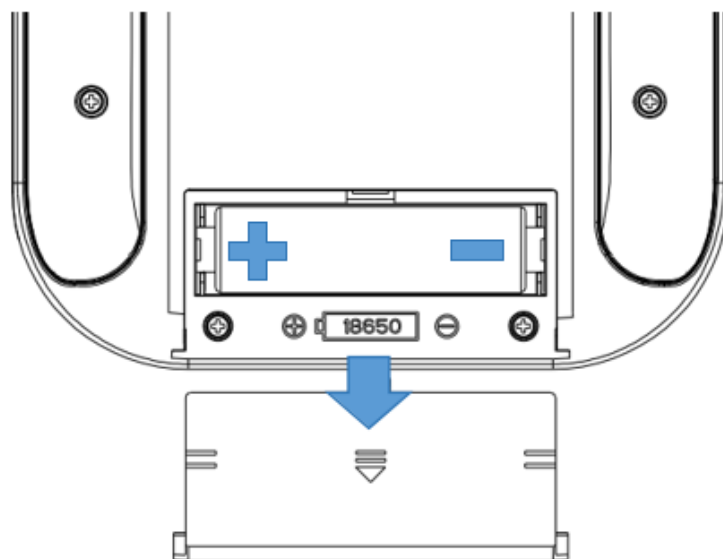
(1) Trainer port: Insert one end of a 3.5 mm male-to-male cable into the trainer port (audio port) and the other end into another transmitter used by the instructor. The corresponding channel values will be output.

(2) Simulator: Connect a Type-C data cable to the transmitter and then to a computer simulator. The corresponding channel values will be output.



1.2.11 Battery and Charging

The transmitter uses one 18650 Li-ion battery and operates at 3.7-4.2 V. To reinstall the battery, slide the battery cover downward and install the battery with the correct polarity. The negative end goes against the spring inside the battery compartment. Align the battery cover with the compartment and slide it forward until it locks. If the battery is installed incorrectly, the transmitter will not charge or power on properly.



To charge the transmitter, connect a Type-C cable to the transmitter Type-C port and connect it to a 5 V charger.

Power indicator status: solid red = charging; solid green = fully charged.

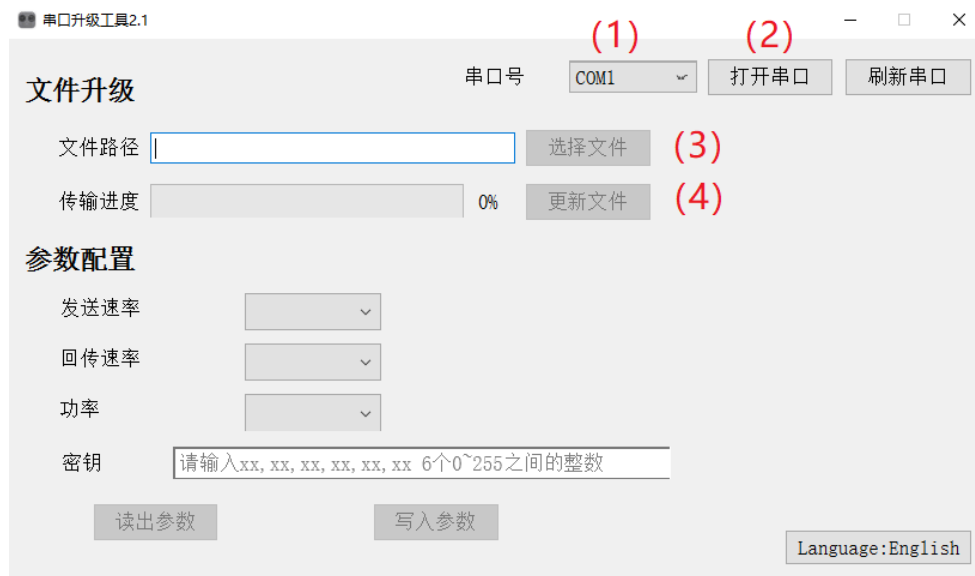
Note: Use a 5 V/1 A adapter and Type-C cable for charging. When voltage is low (3.7 V), the transmitter will warn you: the round indicator flashes red and the transmitter beeps. Charge it promptly.

1.3 E8 Transmitter (ELRS) Serial Tool Instructions

1.3.1 Firmware Update

First hold the R4+ button, then press and hold the power button. When the tone sounds, the mode indicator flashes green and the center indicator stays green, indicating serial flashing mode. Connect the transmitter to the computer with a Type-C data cable, then open the EMAX serial update tool on the computer.

- (1) Find the serial port number and select the port.
- (2) Click to open the serial port.
- (3) Click Select File, choose the firmware file to be updated, and click Update File.
- (4) When the transfer reaches 100%, the transmitter will power off automatically. This means the firmware update was successful.



Note: If the serial port is not detected, replace the data cable, repeat steps (1) and (2), click Refresh Port, or unplug and reconnect the Type-C data cable.

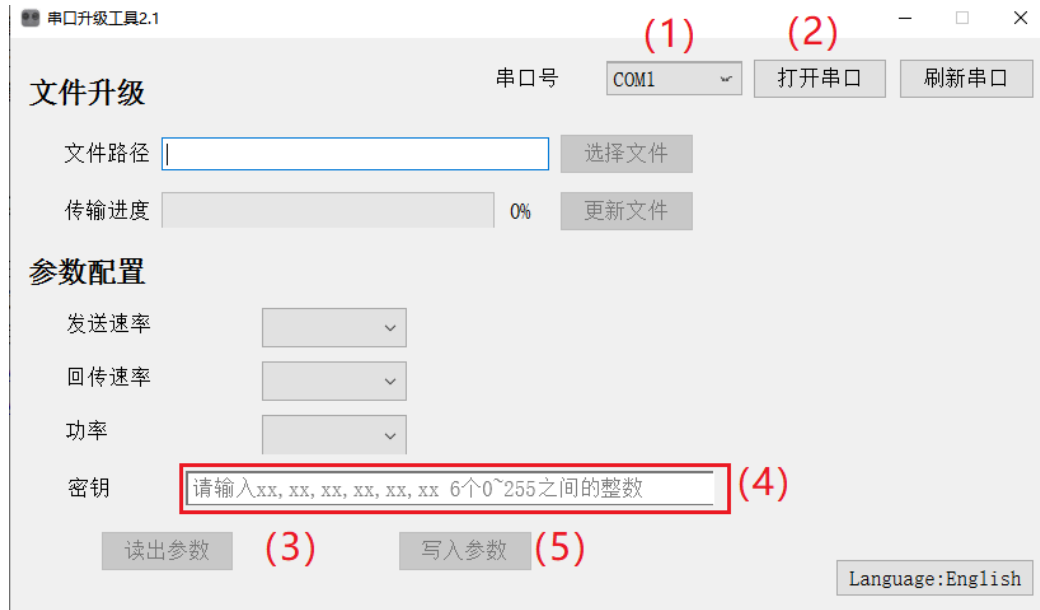
1.3.2 Change Power and Telemetry/Transmit Rates

- (1) Same as step (1) in Firmware Update.
- (2) Same as step (2) in Firmware Update.
- (3) In the parameter configuration section, click Read Parameters. The transmitter's current settings will appear. Find the transmit rate, telemetry rate, and power options. Click the corresponding field and select the desired value.
- (4) Click Write Parameters. When the write-complete message appears, the settings have been changed. Power the transmitter off and back on.



1.3.3 Change Binding Phrase

- (1) Same as step (1) in Firmware Update.
- (2) Same as step (2) in Firmware Update.
- (3) In the parameter configuration section, click Read Parameters to display the transmitter's current binding phrase.
- (4) To change the binding phrase, enter the new value in the field after Binding Phrase. The format must be XX, XX, XX, XX, XX, XX - six integers from 0 to 255.
- (5) Click Write Parameters. When the write-success message appears, the binding phrase has been changed. Power the transmitter off and

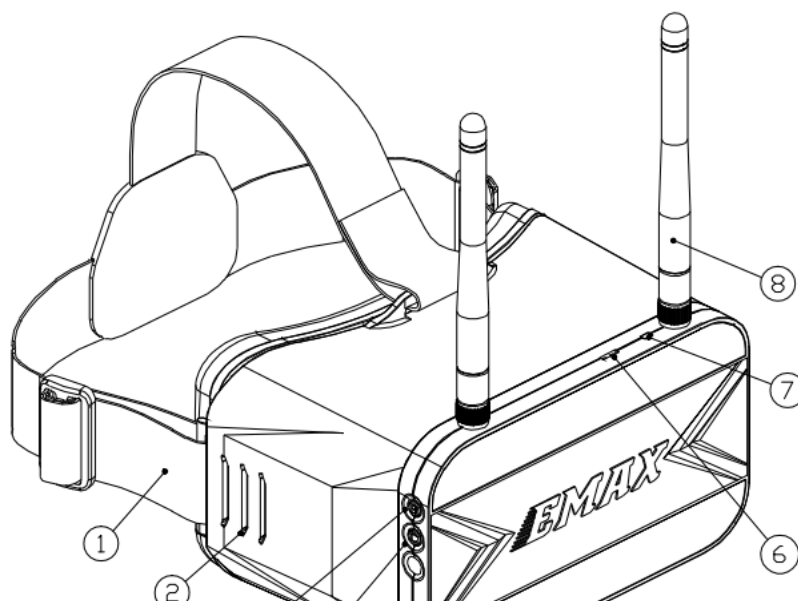


back on.

Note: To obtain the serial update tool, extract the release package, find serial_bootloader.exe, and double-click it to run. Related packages and firmware update files can be downloaded from the EMAX website (www.emax-usa.com).

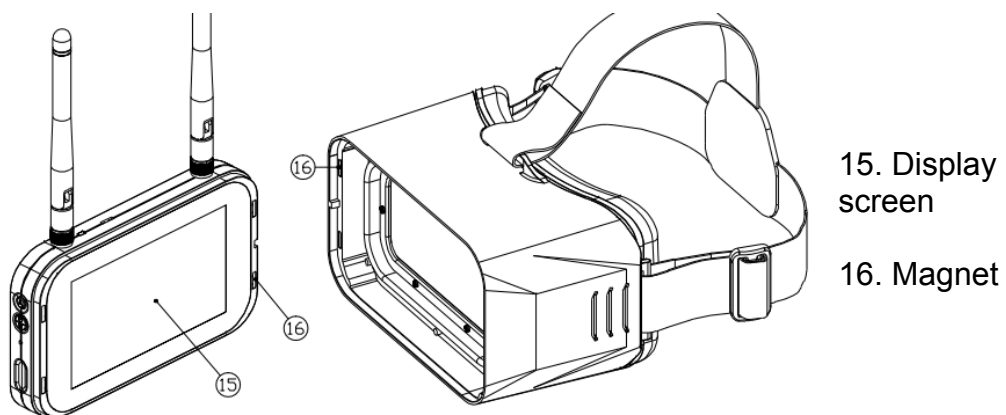
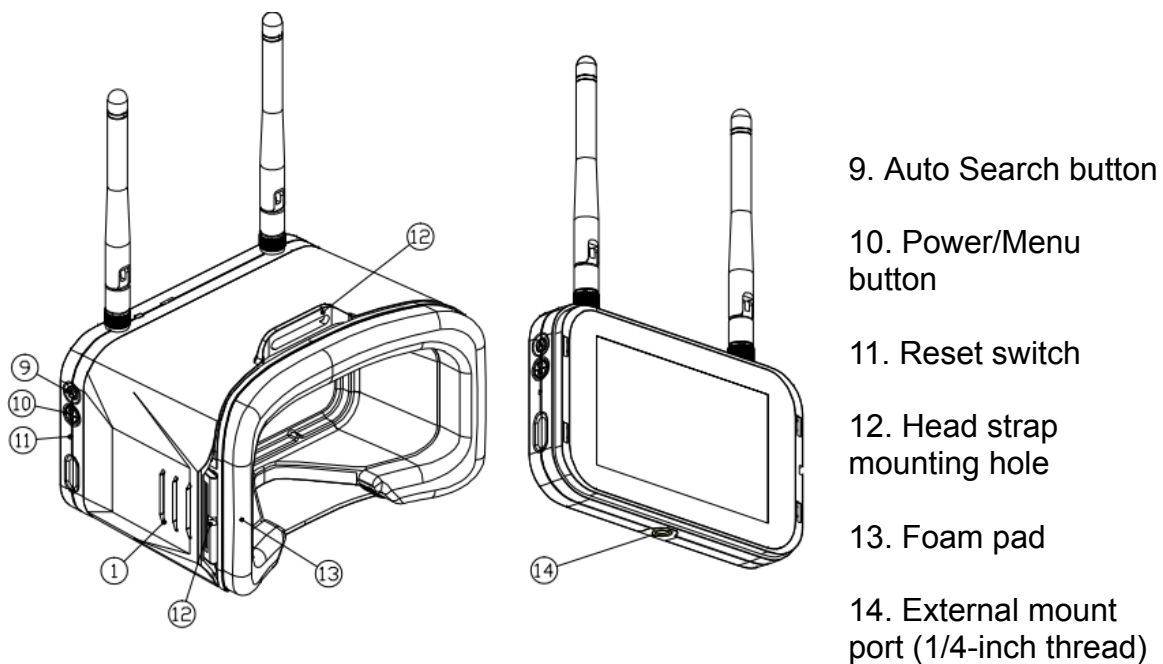
2. Transporter II Goggles

2.1 Transporter II Goggles Diagram



1. Head strap
2. Distance adjustment slots
3. Band button

- 4. Channel button
- 5. Type-C port
- 6. Power-protection switch
- 7. Charging indicator
- 8. Antenna



Goggle screen

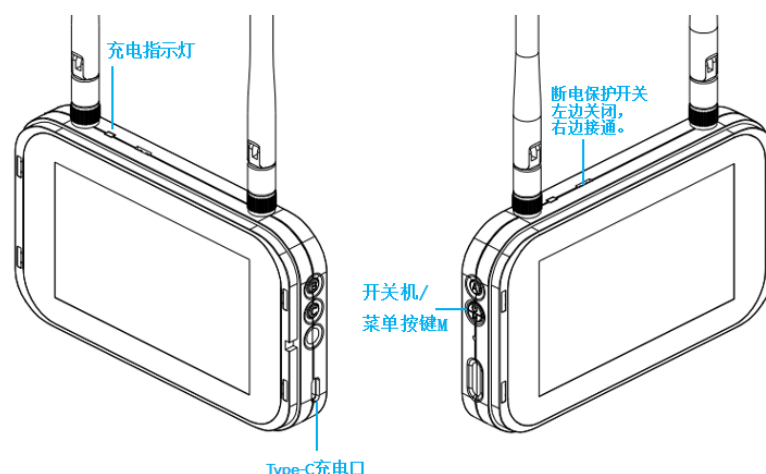
Goggle shell

The goggles have two parts: the goggle screen and the goggle shell. They attach together magnetically.

2.2 Transporter II Goggles Operation

2.2.1 First Use

Before first use, install the antennas and remove the screen protective film. Then switch on the power-protection switch by moving it to the right as shown. Press and hold the Power/Menu button M until the screen turns on and displays "EMAX." The goggles are now powered on. Check the battery level in the upper-right corner of the screen. If the battery is low, charge with a Type-C cable connected to a 5 V charger.



Warning: If the power-protection switch is off, the goggles cannot power on.

2.2.2 Button Functions

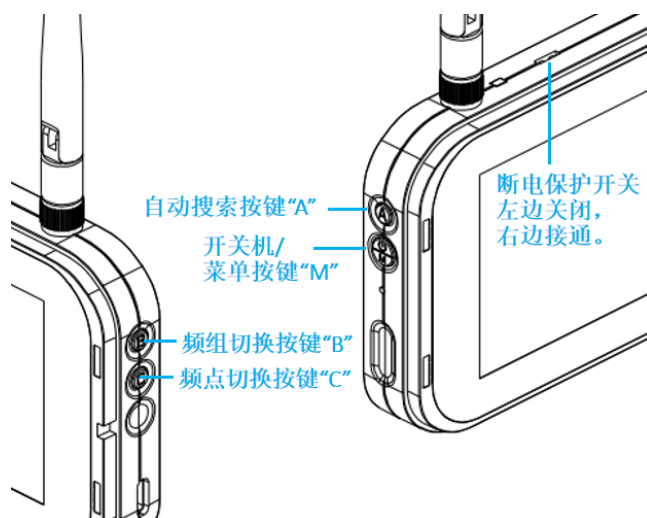
- ◆ Power-protection switch: Protects the battery by preventing slow system drain. Turn this switch off when the goggles will not be used for a long time.
- ◆ Auto Search button A: Press once briefly. The goggles will scan all channels and select the channel with the best video reception. After scanning, the best channel number, band, and frequency are shown in the upper-left corner of the screen.

Warning: If multiple Tinyhawk Lite Adventure aircraft or other drone VTX units are operating at the same time, Auto Search may select the wrong drone channel. We recommend manually selecting the correct channel to prevent a mismatch.

- ◆ Power/Menu button M: Press and hold to power the goggles on or off. When the goggles are on, press briefly to enter the menu mode. Press again to switch menu options: brightness, contrast, saturation, and language. After settings are adjusted, the menu mode automatically closes after about 3 seconds if no button input is detected.
- ◆ Band button B: When powered on, press briefly to cycle through bands (A-B-E-H-F-R). In menu mode, press briefly to increase

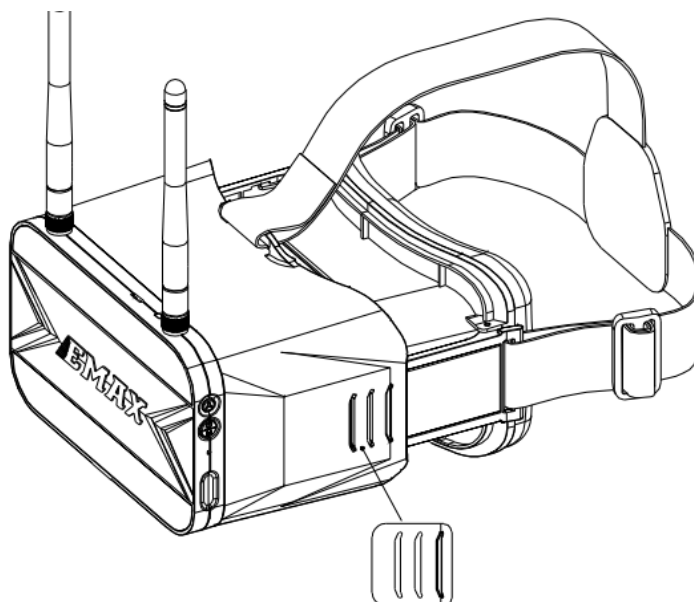
values for brightness, contrast, and saturation or to switch language options.

- ◆ **Channel button C:** When powered on, press briefly to cycle through channels 1-8. In menu mode, press briefly to decrease values for brightness, contrast, and saturation or to switch language options.



2.2.3 Screen Distance Adjustment

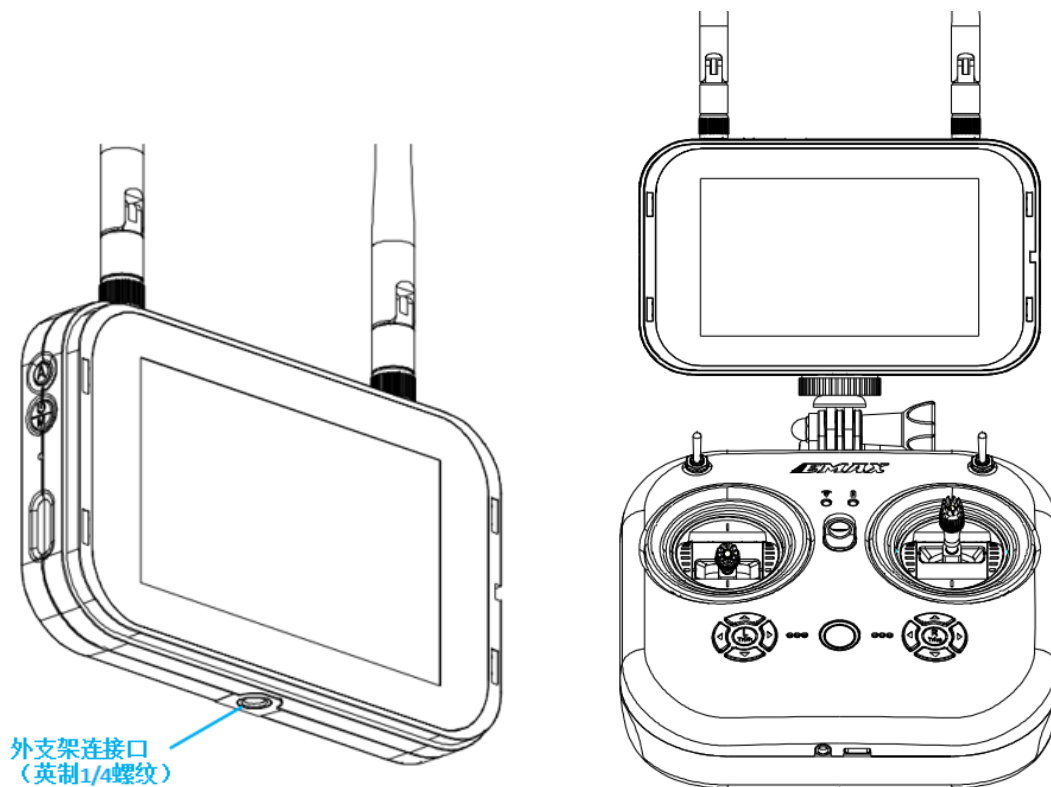
The goggles have three screen-distance adjustment slots for three different distances. Set the left and right sides to the same position.



2.2.4 External Mount Port

The external mount port on the goggle screen accepts other mounts

with a 1/4-inch thread. Use it with the transmitter for FPV Monitor Mode (see 1.2.9).



2.2.5 Video Channel Selection

When cycling through bands or channels, the selected value and frequency are shown in the upper-left corner of the screen.

Example channel display: R-04-5769.

CH FR	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	
F	5740	5760	5780	5800	5820	5840	5860	5880	MHz
R	5658	5695	5732	5769	5806	5843	5880	5917	MHz
A	5865	5845	5825	5805	5785	5765	5745	5725	MHz
B	5733	5752	5771	5790	5809	5828	5847	5866	MHz
E	5705	5685	5665	5645	5885	5905	5925	5945	MHz
H	5362	5399	5436	5473	5510	5547	5584	5621	MHz

Note: Before flying, make sure the Transporter II goggles and the Tinyhawk Lite Adventure aircraft are on the same channel. The currently selected Tinyhawk Lite Adventure channel is shown in the upper-left corner of the screen.

2.2.6 Battery and Charging

The Transporter II goggles include a preinstalled internal 1300 mAh lithium battery. If the battery must be reinstalled or replaced, contact us or visit our website for support. Do not open the rear cover yourself, as this may damage the product.

When the battery is low, charge with a Type-C cable connected to a 5 V charger. After power is connected, the charging indicator status is:

Solid red: charging.

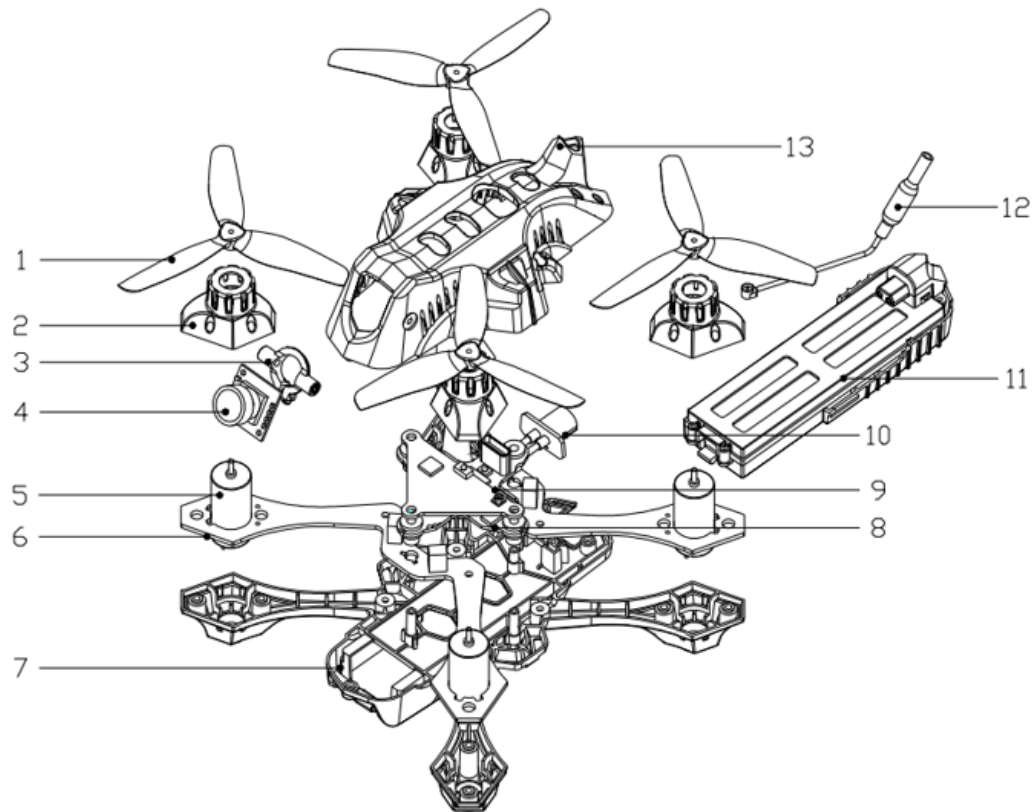
Solid green: fully charged.

Notes:

- ◆ **The goggle screen shows battery level in the upper-right corner. When the screen displays "low battery," charge promptly or the goggles will shut down soon.**
- ◆ **When charging, make sure the power-protection switch is on. Otherwise, the goggles will not charge.**
- ◆ **When the goggles will not be used for a long time, turn the power-protection switch off to protect the battery.**

3. Tinyhawk Lite Adventure

3.1 Tinyhawk Lite Adventure Diagram



- | | |
|-----|----------------------------------|
| 1. | 65 mm three-blade propeller |
| 2. | Motor cover |
| 3. | Camera mount |
| 4. | Camera |
| 5. | 1020 coreless motor |
| 6. | PCBA arm |
| 7. | Drone frame |
| 8. | Flight controller board |
| 9. | VTX board |
| 10. | EM2.0 connector |
| 11. | Battery cartridge |
| 12. | Antenna |
| 13. | Drone body |
| 14. | Battery cartridge terminal cover |
| 15. | Battery cartridge upper cover |
| 16. | Battery |

17. Battery cartridge lower cover

3.2 Tinyhawk Lite Adventure Propellers

The Tinyhawk Lite Adventure uses propellers with two rotation directions: clockwise (CW) and counterclockwise (CCW). When purchasing a propeller set, make sure it includes two CW propellers and two CCW propellers. Propellers rotate toward the blunt side of the blade edge. Install the propellers in the correct orientation shown below.

1. Propeller Installation

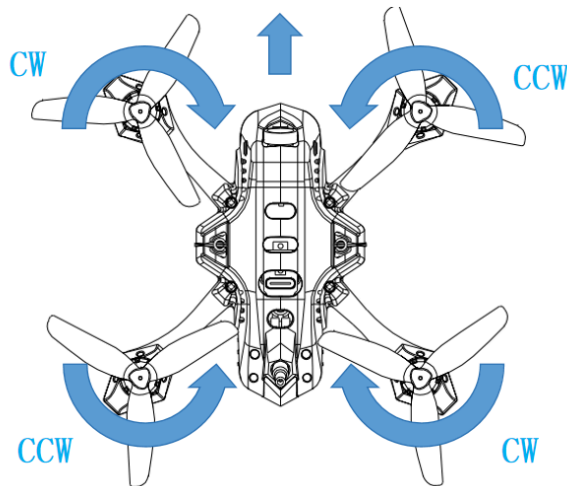
Align the propeller hole with the motor shaft. Support the back of the motor while pressing the propeller down by hand until it is flush with the motor shaft.

Warning: Incorrect propeller installation will prevent the Tinyhawk Lite Adventure from flying correctly and may make it uncontrollable. Carefully verify that each propeller is installed in the correct direction. Failing to support the back of the motor may break the frame. Use caution when installing propellers.

2. Propeller Removal

Use a small tool such as a propeller remover to lift the propeller from the motor shaft, or grip the base of the propeller blade with your fingers and slowly twist it off. Hold the frame at the motor housing with your other hand until the propeller is removed from the motor shaft.

Warning: Remove propellers only when replacing them. Use caution when removing propellers and when using tools.



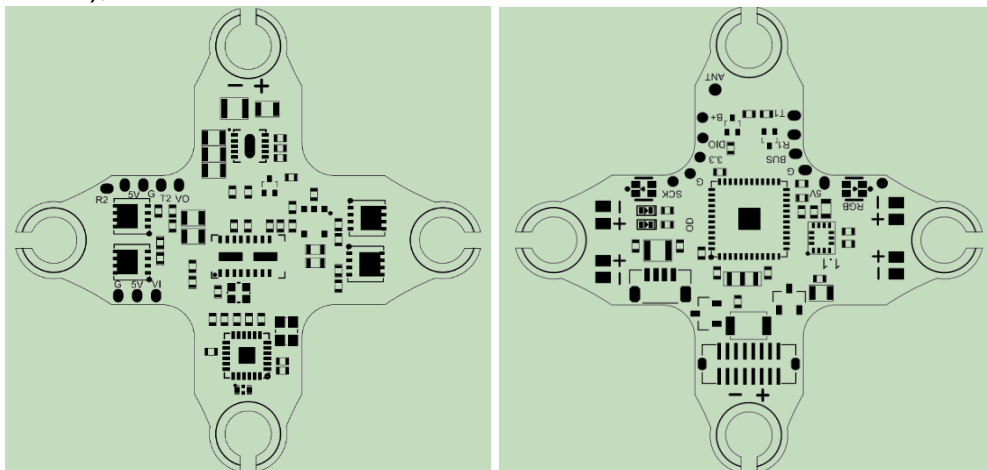
3.3 Tinyhawk Lite Adventure Camera

Model	E02
Input Voltage	3.3 V-6 V; 5 V recommended
Operating Current	80mA
Weight	1.2 g
Dimensions	Length 14 mm x Width 14 mm x Height 11.5 mm
Image Sensor	CMOS 1/4 inch

Resolution	648 (H) x 488 (V)
Lens/Angle	M7, FOV 136 degrees
Video Standard	CVBS (NTSC)
Signal-to-Noise Ratio	48.6dB

3.4 Tinyhawk Lite Adventure AIO Flight Controller

The Tinyhawk Lite Adventure AIO flight controller is an all-in-one board that integrates an F4 MCU, ELRS (2.4 GHz) receiver, OSD support (AT7456E), and 1S 10 A brushed 4-in-1 ESC.

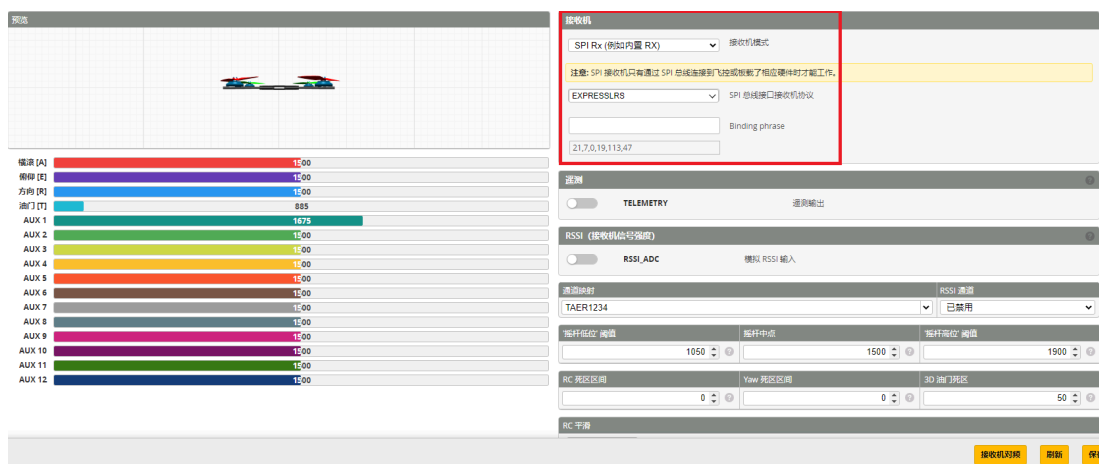


Specifications:

MCU: STM32F411CEU6 (100 MHz).
 MPU: ICM42688 (SPI connection).
 ELRS (2.4 GHz) receiver.
 Supports OSD (AT7456E).
 4-in-1 brushed ESC.
 Power input: 1S.
 Supports programmable RGB LED strip.
 Two serial ports (UART1/UART2).
 Onboard 5 V/2.5 A BEC and 3.3 V/300 mA BEC.
 Firmware: EMAX_TINYHAWKF4SX1280.

3.4.1 ELRS (2.4 GHz) Receiver

The Tinyhawk Lite Adventure receiver is an onboard ELRS (2.4 GHz) receiver. It uses an SX1280 RF module, SPI communication, and an ultra-soft 28 AWG red silicone-wire antenna. The frequency range is 2400-2480 MHz. The receiver protocol is ExpressLRS, protocol version ELRS V3.0.



3.5 Tinyhawk Lite Adventure VTX

The Tinyhawk Lite Adventure is equipped with a 32-bit open-source analog VTX and the E02 analog camera.

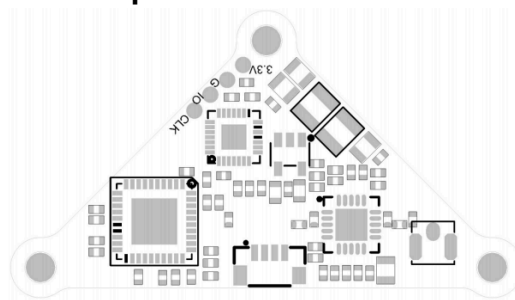
The 32-bit analog VTX specifications are:

Frequency: 5.8 GHz, 40 channels.

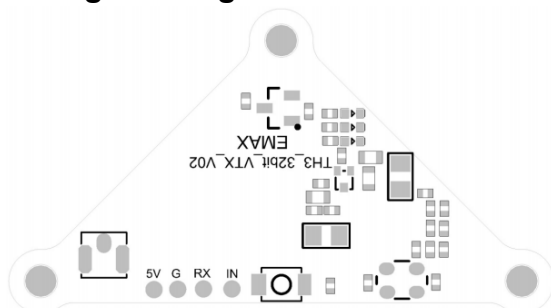
RF power: 0/25 mW/100 mW/400 mW.

Power input: 5 V.

Other: Supports the SmartAudio protocol and VTX firmware updates



through the flight controller.

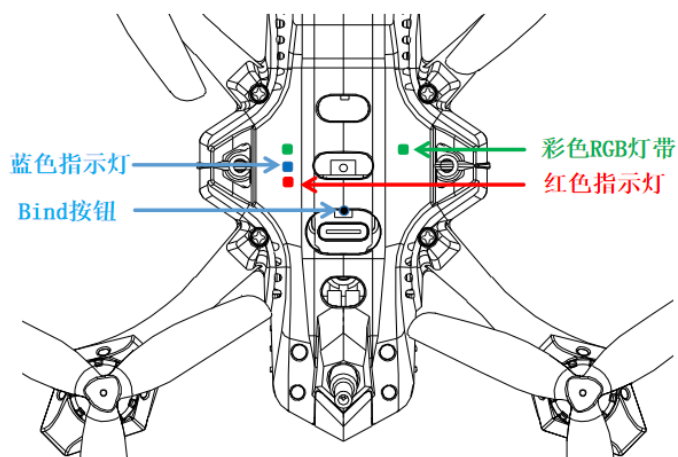


3.6 Indicator Lights

3.6.1 Flight Controller Blue and Red LED Status

The Tinyhawk Lite Adventure flight controller has blue and red LED indicators that show power-on, standby, pre-flight, and flight status, as shown in the table below.

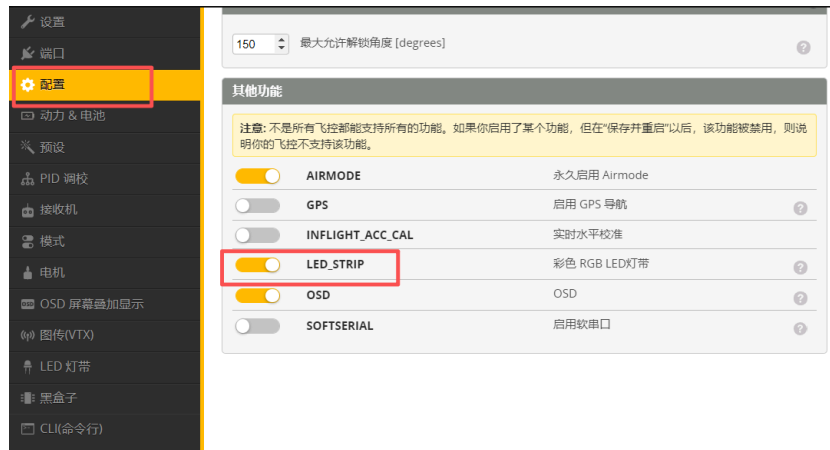
LED Color	LED Status	Transmitter Signal	Status Description
Blue LED	Solid	Connected	The drone has received the transmitter signal; binding is successful.
	Fast Flashing	Not connected	The drone has entered binding mode and is searching for the transmitter signal.
	Slow Flashing	Not connected	The drone has not received the transmitter signal.
Red LED	Slow Flashing	Not connected	The drone is in normal standby.
		Connected	The throttle stick is not at the lowest position.
	Fast Flashing	—	When the drone powers on, the LED flashes quickly three times to indicate that gyro auto-calibration succeeded.
		Connected	If the throttle stick is not at the lowest position and the AUX1 arm switch is moved from locked to unlocked, the LED flashes quickly five times and the motors do not spin.
	Off	Connected	When the AUX1 arm switch is in the locked position and the throttle stick is at the lowest position.
	Solid	Connected	When the AUX1 arm switch is unlocked, the motors are spinning, and the drone is flying normally.



3.6.2 Color RGB LED Strip

The Tinyhawk Lite Adventure flight controller includes two color RGB LEDs (green lights in the figure above). The programmable RGB LED function lets users customize each LED's color and display mode to show flight status, battery level, and other information at a glance.

(1) Connect to Betaflight Configurator. Select the Configuration menu, then select LED_STRIP to open the LED Strip menu.



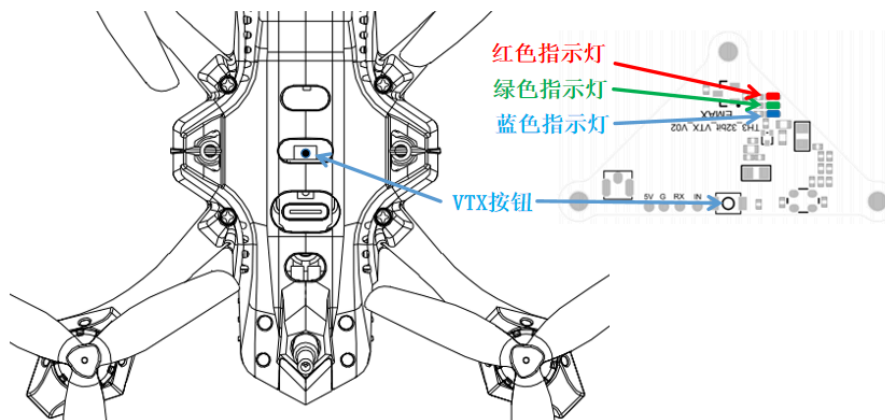
(2) In the LED Strip menu, customize the RGB LED strip function settings.



3.6.3 VTX LED Status

The Tinyhawk Lite Adventure VTX board has red, blue, and green LED indicators.

- (1) Red LED: In normal LED mode, the red LED lights when the device starts and flashes when settings are saved.
- (2) Blue and green LEDs: These indicate current operating status, including band, channel, and power.



This indication is available when using MSP (VTX communication protocol), SmartAudio, or the VTX button. Because TRAMP does not use a fixed VTX table, a complete frequency table is not supported through TRAMP

in this mode. The indication logic is as follows:

- ◆ When the green LED flashes once, the current display is the band. The blue LED flashes 1 to 6 times to indicate A, B, E, F, R, and L respectively.
- ◆ When the green LED flashes twice, the current display is the channel. The blue LED flashes 1 to 8 times to indicate channels 1 through 8.
- ◆ When the green LED flashes three times, the current display is transmit power. The blue LED flashes 1 to 5 times to indicate 0, RCE, 25, 100, and 400 (or custom power).

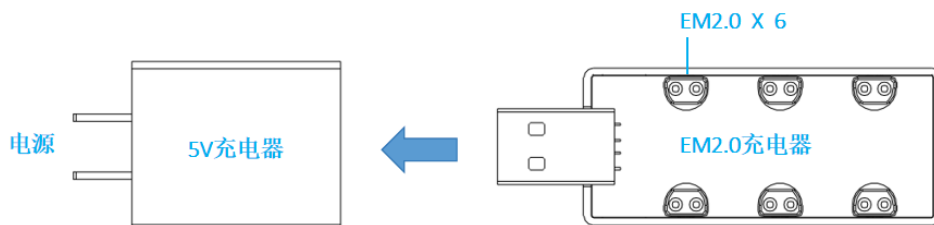
GREEN LED		BLUE LED							
		1x	2x	3x	4x	5x	6x	7x	8x
1x	Band	A	B	E	F	R	L		
2x	Channel	1	2	3	4	5	6	7	8
3x	Power Level	0	RCE	25	100	400			

If TRAMP is used, or if LED_INDICATION_OF_VTX_MODE=0, the red LED still lights at startup and flashes when settings are saved. The green LED stays solid after a protocol is detected, such as when the flight controller successfully communicates with the device through TRAMP. The blue LED flashes once each time a communication packet is received.

3.7 Battery and Charging

The Tinyhawk Lite Adventure uses a 1S 850 mAh battery. Charge promptly when the battery is low or reaches 3.2 V to avoid damaging the battery.

Connect the EM2.0 charger to a 5 V charger, then connect it to power. EM2.0 charger indicator: solid green while charging; green light off when fully charged.



4. Tinyhawk Lite Adventure Advanced Functions and Operations

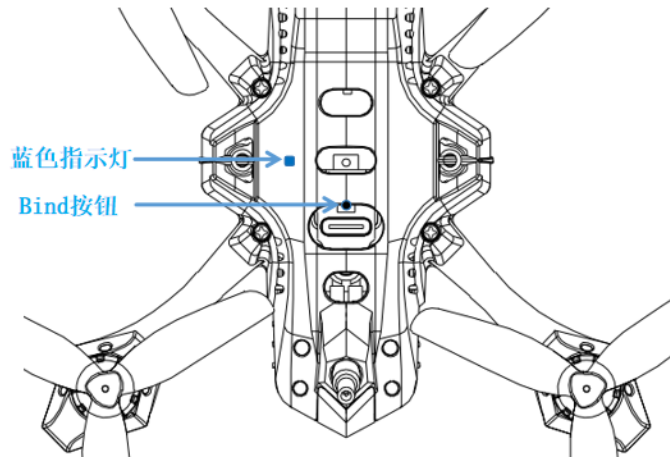
4.1 Binding the Tinyhawk Lite Adventure to the Transmitter

4.1.1 Transmitter Binding Method

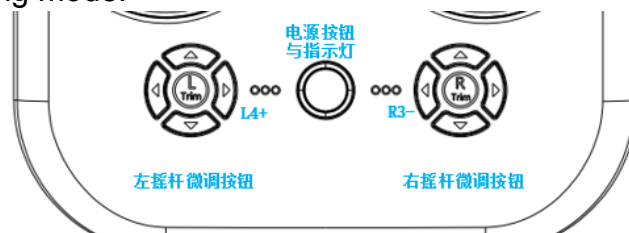
Binding is the process of connecting the drone's ELRS (2.4 GHz) receiver to the transmitter. One receiver can be bound to only one transmitter, while one transmitter can bind to multiple receivers.

The transmitter is already bound to the Tinyhawk Lite Adventure in the RTF kit. If binding is necessary, follow these steps, provided the binding phrase has not been changed:

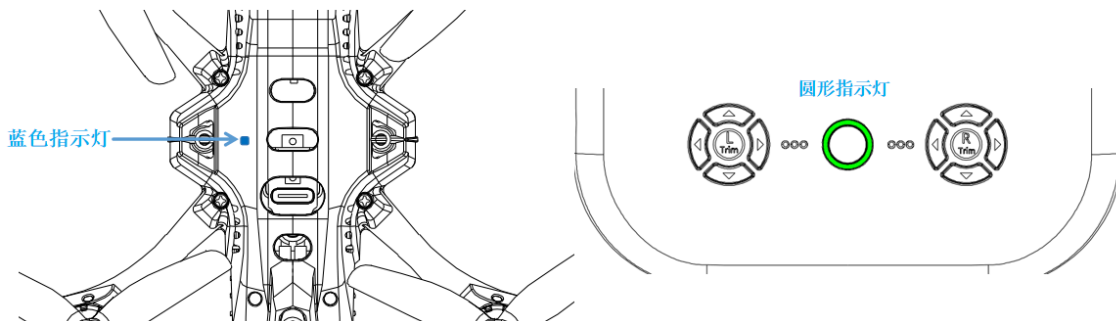
(1) Put the flight controller into binding mode: Power on the Tinyhawk Lite Adventure. After startup, briefly press the Bind button to enter binding mode. The blue indicator on the flight controller changes from slow flashing to fast flashing, indicating binding mode.



(2) Put the transmitter into binding mode: Power on the transmitter, then press and hold the L4+ and R3- buttons together until the center round indicator flashes green and red alternately. This indicates that the transmitter has entered binding mode.



(3) Watch the blue indicator on the Tinyhawk Lite Adventure flight controller. When it changes from fast flashing to solid blue, and the transmitter's round indicator changes from alternating green/red flashing to solid green, the drone and transmitter are bound successfully.



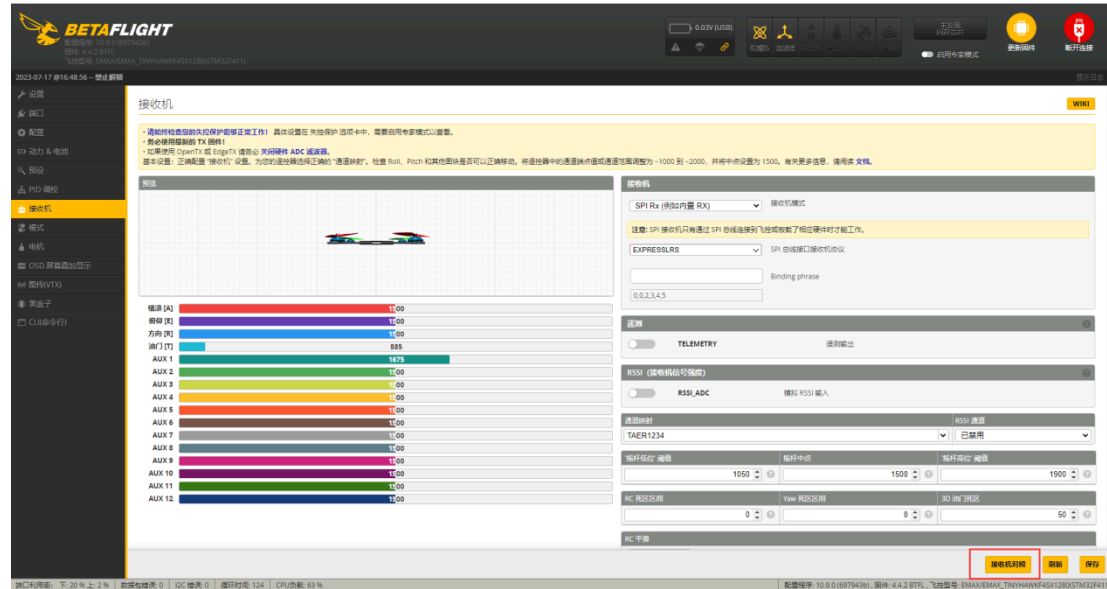
(4) If binding fails, repeat steps (1), (2), and (3) until binding succeeds.

Note: Binding between the transmitter and receiver does not need to be repeated unless one of the two products is replaced.

4.1.2 Other Tinyhawk Lite Adventure Binding Methods

(1) You can also put the receiver into binding mode through Betaflight Configurator. In the CLI tab, type the command `bind_rx` and press Enter. The receiver will enter binding mode.

(2) You can also go to the Receiver section in Betaflight Configurator and click Receiver Bind. The receiver will enter binding mode.

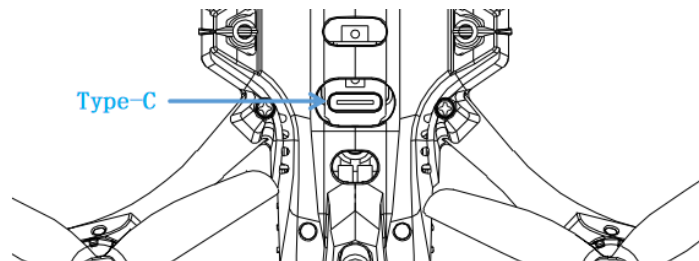


4.2 Calibrating the Accelerometer

The Tinyhawk Lite Adventure accelerometer is calibrated at the factory. Recalibrate it if the drone cannot hold a stable hover in Angle/ARM mode or Horizon mode and slowly drifts in one fixed direction, or after replacing the flight controller or reflashing firmware.

(1) Connect the Tinyhawk Lite Adventure to Betaflight Configurator with a Type-C data cable.

(2) Place the Tinyhawk Lite Adventure on a level surface. Open the Setup menu in Betaflight Configurator and click Calibrate Accelerometer. Do not move the drone during calibration.



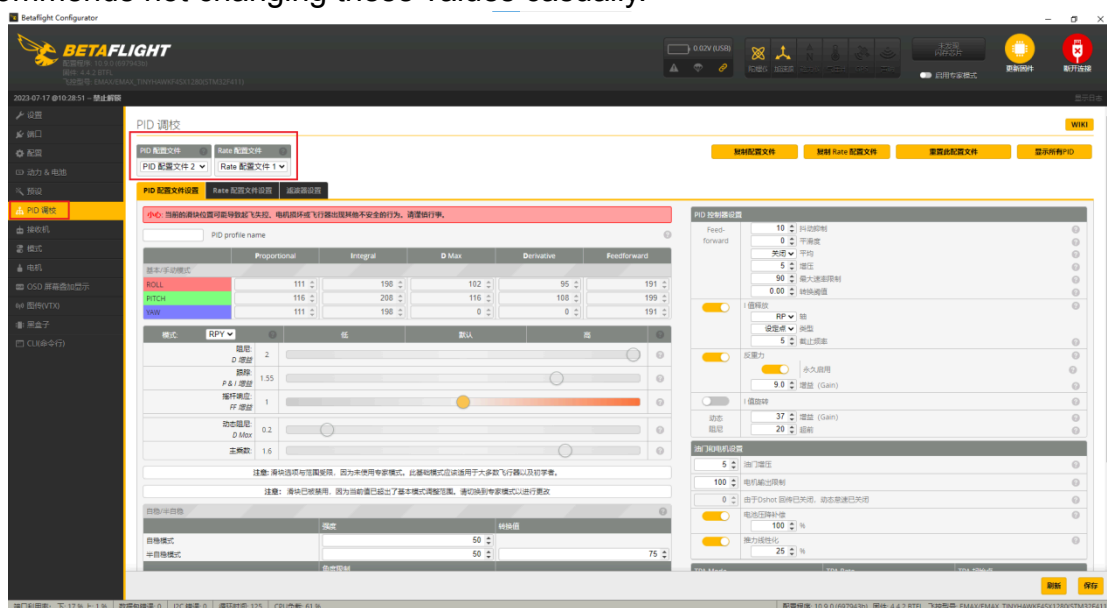


4.3 PID Profile Overview

PID Profile 1 is tuned and optimized for the Tinyhawk Lite Adventure with the included 1S 850 mAh battery cartridge. It is intended for precise indoor and outdoor flight control and is designed for the best indoor control with the 1S 850 mAh battery cartridge.

Profile 2 is a more advanced rate profile tuned for pilots who use a pinch-style grip. These profiles can be easily switched in the Betaflight OSD menu.

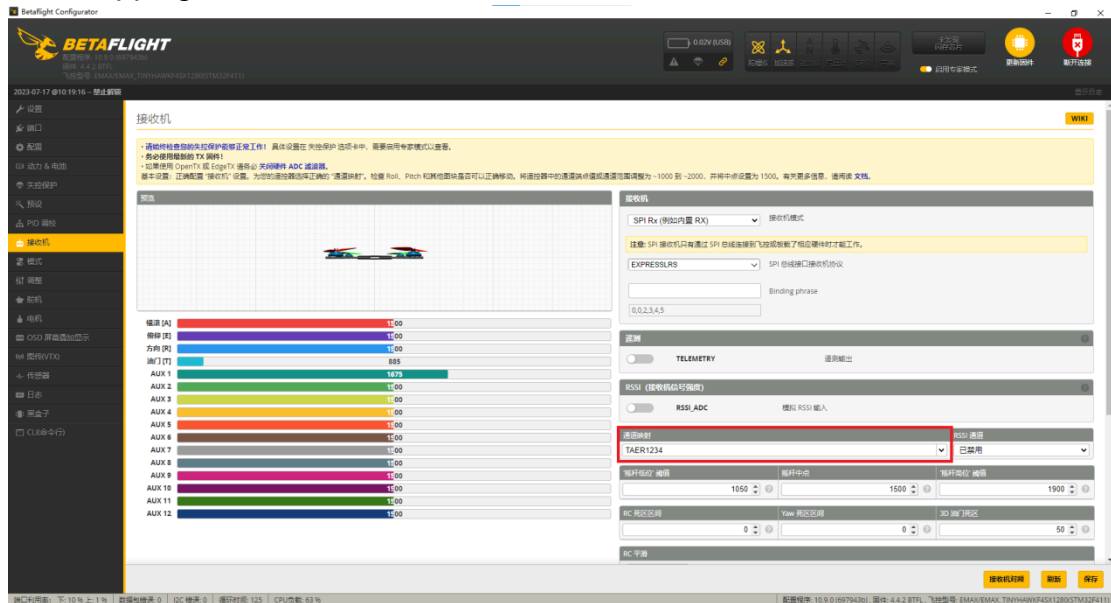
These settings have been professionally tuned. EMAX strongly recommends not changing these values casually.



4.4 Adjusting Channel Settings

Betaflight Configurator can be used to change the Tinyhawk Lite Adventure's programming settings. Betaflight Configurator and flight controller firmware are available at <https://github.com/betaflight/>.

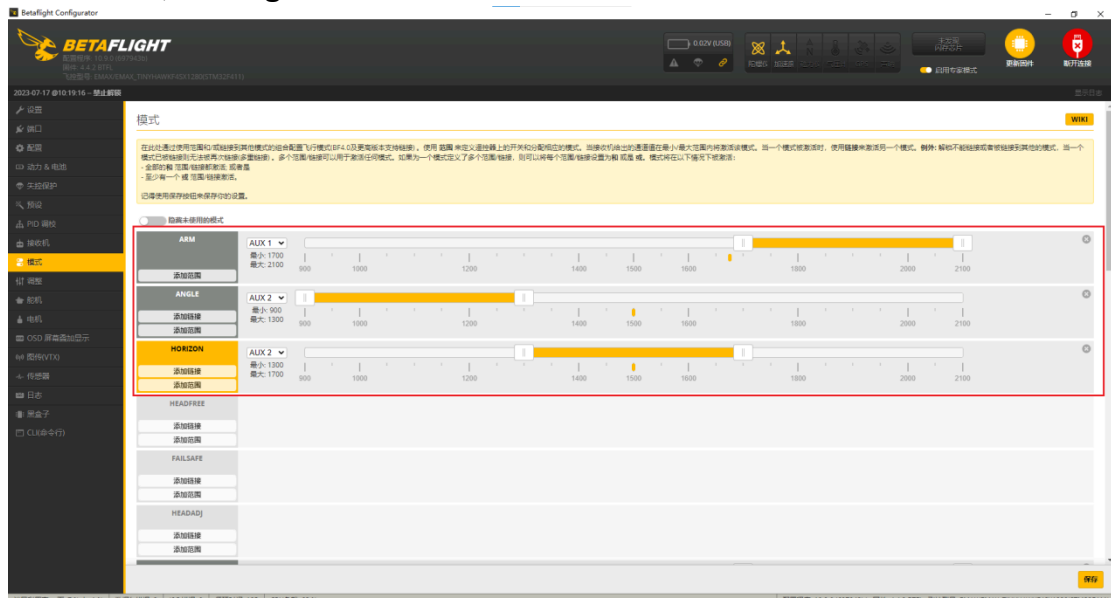
The Tinyhawk Lite Adventure is configured at the factory with TAER1234 channel mapping.



Using the E8 Transmitter (ELRS 2.4 GHz) as an example:

AUX 1 is a three-position switch and is used as the arm switch.

AUX 2 is a three-position switch and selects flight mode: Acro Mode, Horizon Mode, or Angle Mode.

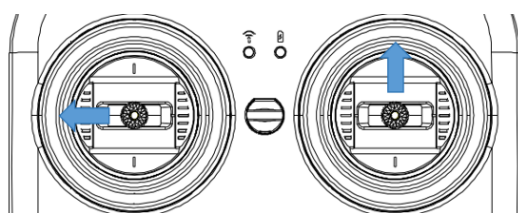


Configure your E8 Transmitter (ELRS 2.4 GHz) as described above, or change these settings in Betaflight Configurator.

4.6.2 SmartAudio (Open the OSD Menu in the Goggles with the Transmitter)

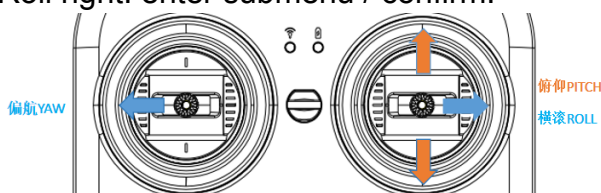
The Tinyhawk Lite Adventure is equipped with SmartAudio and is already configured. SmartAudio runs on UART2 TX. Using transmitter stick commands in the goggle screen OSD, you can adjust VTX band, channel, power, OSD settings, and other parameters. The following example uses VTX settings:

- ◆ Power on the Tinyhawk Lite Adventure, goggles, and transmitter. Make sure video channel matching and transmitter binding are successful.
- ◆ With throttle at the middle position, hold both sticks so yaw is left and pitch is up (THROTTLE MID + YAW LEFT + PITCH UP) to enter the goggle OSD menu.



MAIN		
	PROFILE	>
>	FEATURES	>
	FCE FIRMWARE	>
	MISC	>
	SAVE / EXIT	>

- ◆ In the goggle OSD menu, use the controls as follows:
 Yaw left: return to the previous menu. Pitch up/down: switch menu options.
 Roll right: enter submenu / confirm.



- ◆ Move the cursor to FEATURES and roll right to enter the FEATURES submenu. Move the cursor to VTX and roll right. This opens the VTX configuration menu (SMARTAUDIO).

— FEATURES —		
>	VTX	>
	LED STRIP	>
	POWER	>
	PERSISTENT STATS	>
	BACK	

— SMARTAUDIO —		
F R4 5769 25		
>	BAND	RACEBAND
	CHAN	4
	(FREQ)	5769
	POWER	25
	PIT	OFF
	SAVE & EXIT	>
	CONFIG	>
	BACK	

In the VTX configuration menu (SMARTAUDIO), you can set BAND, CHAN, POWER, and other options. After setting, move to SAVE or EXIT to save and exit.

Warning: Select only a legal power level according to your local laws and regulations.

4.7 Changing the Flight Controller Binding Phrase

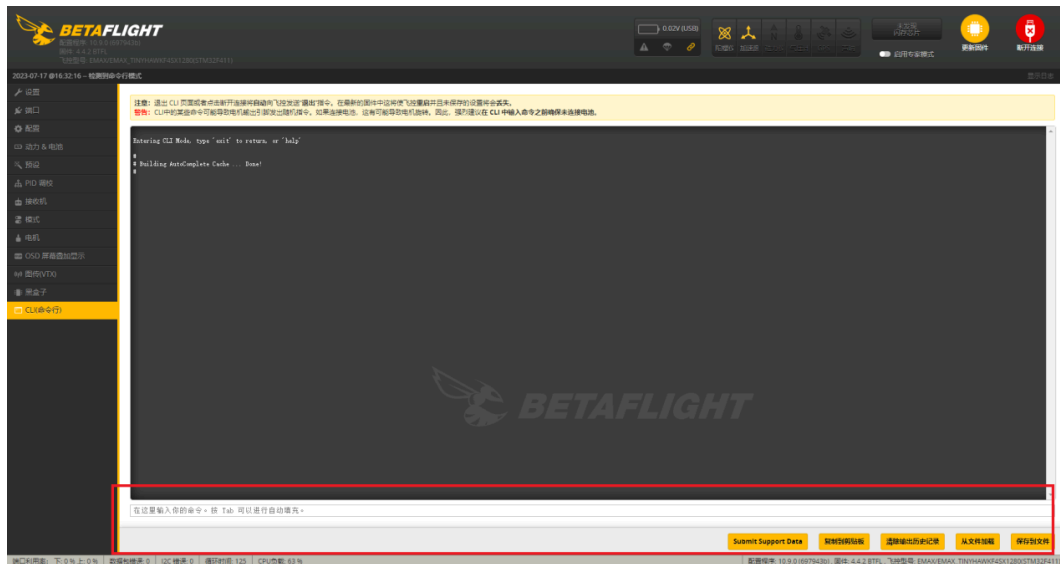
Use Betaflight Configurator and the EMAX serial update tool to read the current binding phrases from the aircraft and transmitter. You can write the aircraft binding phrase to the transmitter through the EMAX serial update tool, or write the transmitter binding phrase to the flight controller through Betaflight Configurator.

To change the flight controller binding phrase in Betaflight Configurator, enter the following command in the CLI. The example below uses 0, 1, 2, 3, 4, 5 as the binding phrase:

```
set expresslrs_uid = 0,1,2,3,4,5
```

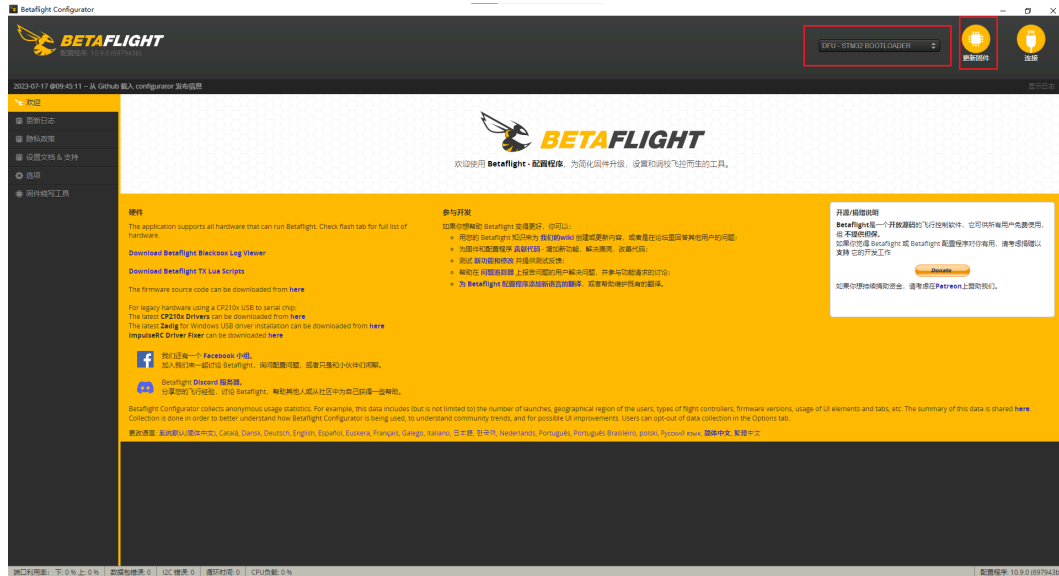
Save

Press Enter, then wait for the flight controller to reboot and reconnect to Betaflight Configurator. The binding phrase has now been changed.



4.8 Flashing Flight Controller Firmware

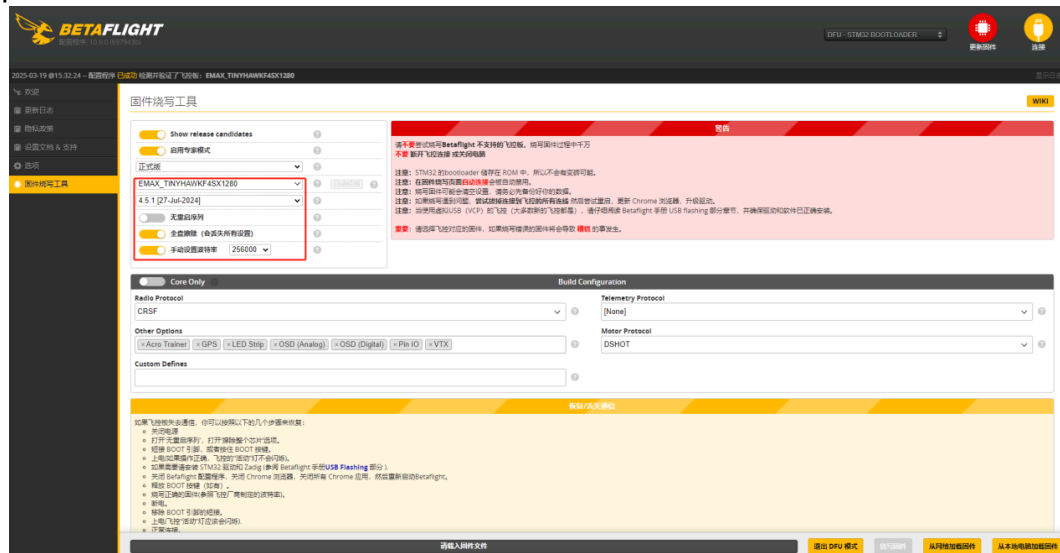
(1) Locate the Boot button on the flight controller board. Boot and Bind are the same button. Hold the Boot button while connecting the flight controller with a Type-C data cable to enter DFU mode, then click Update Firmware. If DFU mode cannot be entered, check the data cable and make sure the required drivers are installed on the computer.



(1) Select EMAX_TINYHAWKF4SX1280, 4.5.1 as the firmware. In the drop-down menu, select a manual baud rate of 256000.

(2) Choose to load firmware from the internet or from the local computer, then wait for the download to complete.

(3) Finally, click Flash Firmware. After a few seconds, flashing will be complete.

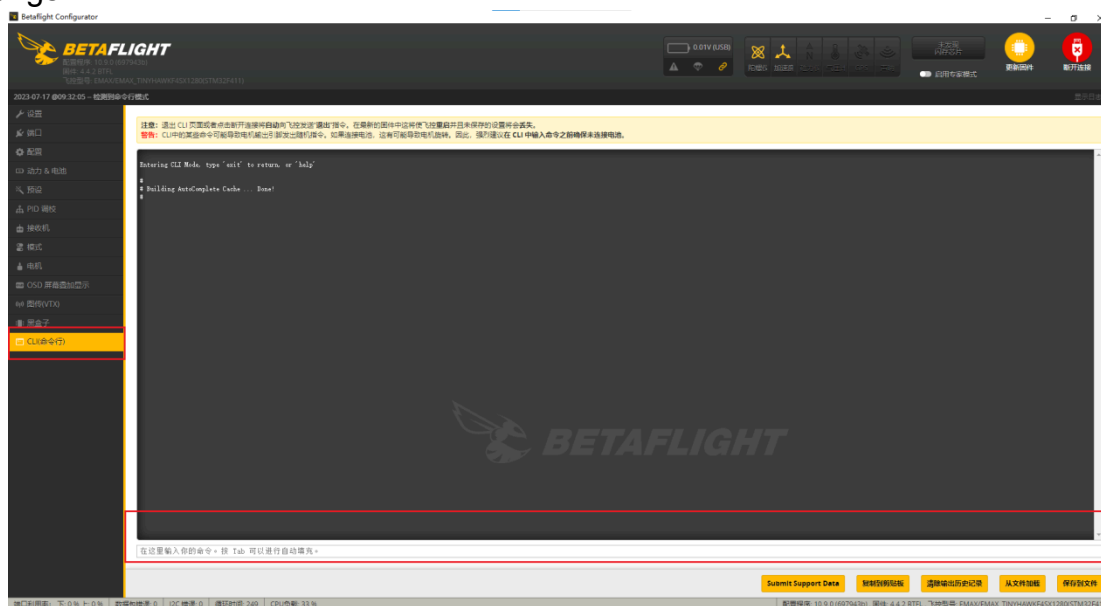


Note: The BOOT button and BIND button are the same button, and it is the only button on the flight controller board.

4.9 Flashing Flight Controller Settings

Download the latest CLI Dump file from <https://emax-usa.com/>. Open the CLI Dump file in a text editor and copy all text. Paste the settings into the command line and press Enter.

After completion, the flight controller will reconnect to Betaflight Configurator and the Tinyhawk Lite Adventure will be restored to default settings.



Disclaimer:

The Tinyhawk Lite Adventure has been tuned for optimal performance. Changing the PID settings can affect flight time, overall speed, aircraft control, and internal motor temperature. We do not recommend changing any Tinyhawk Lite Adventure PID settings or upgrading the firmware to a newer version.

5. Battery Safety and Precautions

The Tinyhawk Lite Adventure uses a 1S 850 mAh high-voltage lithium battery cartridge. Use it safely.

5.1 Inspection and Emergency Handling

(1) Before each use, inspect the battery. If you find any swelling, deformation, damage, or leakage, stop using it immediately and recycle it properly as hazardous waste. Do not continue charging or flying with it.

(2) Do not puncture, crush, drop, disassemble, or modify the battery.

(3) When the battery is not in use, keep its exposed EM2.0 plug away from metal objects to prevent short circuits.

(4) During charging or use, if the battery produces an odor, smokes, becomes abnormally hot, or catches fire:

- ◆ Immediately disconnect power.
- ◆ Small fire: Use a large amount of dry chemical extinguisher powder, sand, or soil to cover and extinguish the fire.
- ◆ Large fire: Evacuate immediately and call emergency services.

5.2 Charging Safety

(1) The 1S 850 mAh battery is a high-voltage lithium battery with a maximum full-charge voltage of 4.35 V. Charge it with the EM2.0 charger designed for 1S lithium batteries, or use another charger that supports 1S high-voltage lithium batteries.

(2) Always supervise the battery while charging. Do not leave it charging unattended for long periods.

(3) Charge in a suitable ambient temperature, such as 10 C-45 C, and in a safe environment. Use a hard, nonflammable surface such as tile or concrete, clear flammable objects within 1 meter, and ensure good ventilation.

(4) A battery that has just been flown may be hot internally. Wait until it cools to room temperature, about 25 C, before charging.

(5) Do not reverse-charge. Connect the battery polarity correctly. If the positive and negative terminals are reversed, the battery will not charge and may produce odor, smoke, abnormal heat, short circuit, or other serious problems.

5.3 Discharging and Use

(1) During flight, always enable battery-voltage display in the goggle OSD or use a buzzer voltage alarm to monitor voltage in real time. For FPV flight, we recommend landing at no lower than 3.2-3.3 V to protect the battery and avoid over-discharge. The minimum safe discharge limit for a 1S battery is 3.0 V. Below this value, irreversible battery damage may occur.

(2) Avoid aggressive discharge. Long periods of full-throttle flight cause high-current battery discharge, sudden voltage sag, and high heat. This can damage the battery and may cause loss of control due to insufficient voltage.

5.4 Storage and Maintenance

(1) Proper storage voltage: If you do not plan to fly for more than 3 days, charge or discharge the battery to a storage voltage of 3.7-3.9 V. Do not store a fully charged battery for long periods, as this may cause swelling and reduced capacity.

(2) Storage environment: Store batteries in a dry, cool place away from direct light. Storage temperature must be within -20 C to 35 C. For long-term storage over 3 months, the recommended environment is 23 +/- 2 C with humidity no higher than 75% RH. A dedicated LiPo-safe bag is recommended.

(3) Regular maintenance: Even during long-term storage, perform a full charge/discharge cycle every 3 months, then return the battery to storage voltage (3.7-3.9 V) to maintain battery health.

6. Flight Safety

6.1 Pre-Flight Preparation

(1) Choose a suitable flight area.

(2) Equipment check:

Tinyhawk Lite Adventure aircraft: The frame is not deformed; propellers and motors are installed correctly and rotate smoothly; the VTX and antenna are securely connected; the battery is firmly mounted and sufficiently charged.

Transmitter: All buttons and sticks operate normally, the battery is sufficiently charged, and the transmitter is correctly bound to the aircraft.

Goggles: All buttons operate normally, the battery is sufficiently charged, the goggles are tuned to the correct aircraft video channel, and the goggle OSD information is normal and clear.

(3) Confirm the viewing setup: immersive FPV goggle mode or FPV monitor mode.

(4) Confirm the flight mode: Angle Mode, Horizon Mode, or Acro Mode.

(5) Low hover check: After arming, gently raise the throttle so the aircraft lifts about 1 meter off the ground. Hover for 2-3 seconds.

Confirm:

Whether the aircraft shakes abnormally. If it does, address the issue immediately.

Whether the aircraft yaws abnormally. If it does, recalibrate the accelerometer.

6.2 Real-Time Monitoring During Flight

6.2.1 Battery Voltage

Always watch the aircraft battery voltage in the goggle OSD.

(1) Fully charged battery: 4.35 V. The actual displayed voltage may be lower than this value.

(2) Battery warning level: During flight, return to the takeoff area when voltage drops to about 3.3-3.5 V, depending on how far the aircraft is from the pilot. We recommend landing at no lower than 3.2-3.3 V to protect the battery and avoid over-discharge. The minimum safe discharge limit for a 1S battery is 3.0 V; below this value, irreversible battery damage may occur.

6.2.2 Safety Buffer Zone

Altitude: Beginners should practice below 10 meters whenever possible while leaving enough buffer space.

Distance: Keep the aircraft near your line of sight, recommended within 200 meters, or at least within the range where the goggle image is clear and the signal is stable.

Stay away from people: Keep clear of crowds and never fly directly over people, even at high altitude, in case control is suddenly lost. If a crash is unavoidable, aim for grass or dirt rather than roads, vehicles, or people.

6.2.3 Signal Awareness

If the image shows static (signal interference) or the OSD shows RXLOSS (receiver signal lost), immediately hover or reduce altitude. Do not continue flying forward. Try changing antenna direction or returning to an area with a stronger signal.

6.3 Landing and Inspection

Land the aircraft on a flat surface. After landing, lock/disarm the transmitter immediately with the AUX1 arm switch, then unplug the aircraft battery and place it on a safe, heat-resistant surface to cool.

Inspect the motors and flight controller board for any burnt smell and check that the motors rotate normally. If everything is normal, you may install another battery cartridge and continue flying, or power off the transmitter and goggles to end the flight.

Thank you for choosing our product. Enjoy your first flights!



Warning:

Be aware of your surroundings. Use is prohibited for anyone under 14 years of age.
Contains small parts. Keep away from children to prevent accidental swallowing.



MADE IN CHINA