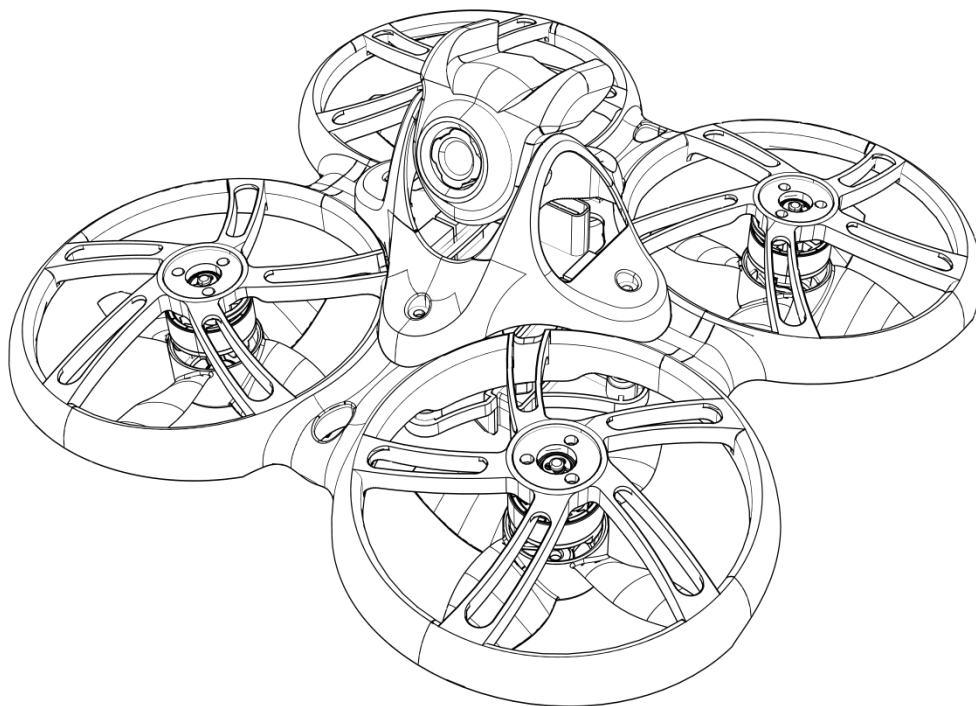


Tinyhawk III Plus

TINY HAWK III PLUS



Thanks for purchasing the Tinyhawk III Plus.
Please follow the instruction manual to assemble and configure your Tinyhawk III Plus.

Design in California, Made in China

Disclaimer:

1. Please read this disclaimer carefully before using this product.
2. By using this product, you indicate your agreement with this disclaimer and confirm that you have read this product carefully.
3. This product is not suitable for individuals under 18 years old. It is strongly recommended that children under 18 years old be supervised by adults.
4. Please read the user manual and warnings carefully.
5. Before each flight, ensure the battery is fully charged, power connections are secure, and do not fly around crowds, children, animals, or objects.
6. Our Tinyhawk III Plus comes equipped with an open-source flight controller and electronic speed controller to meet the needs of FPV enthusiasts upgrading their quadcopters.
7. EMAX is not responsible for any direct or indirect damages or injuries resulting from the use of this product.

Important Notes:

1. Please assemble and operate this product correctly according to the instructions.
2. Fly in a safe area away from crowds.
3. Do not use this product in strong electromagnetic environments.
4. Do not use this product in adverse conditions such as wind, rain, lightning, snow, etc.
5. Do not use this product if you have physical or mental illnesses, dizziness, fatigue, or if you are under the influence of alcohol or drugs.
6. Do not modify or use unauthorized EMAX parts and accessories.
7. Support:
8. For updates or technical support, please visit the emax-usa.com or emaxmodel.com websi

Tinyhawk III Plus(HD)	
Wheelbase	76mm
Maximum appearance size	LxWxH=105x105x45mm
Weight	35.5g(without battery)
Motor	TH0802 II-15000KV
propeller	Avan TH Turtlemode-2
Main control board	STM32F411 (100MHz) main control Integrated 4-in-1-6A-8 bit electrical regulation, input voltage 1-2S On board ELRS (2.4G) receiver (SPI communication)
Camera	HDZERO Nano Lite Camera
Image transmission	HDZero whoop Lite 0/25mW/200mW
Battery	1S HV 650mAh
E8 Transmitter(ELRS-2.4G)	
Maximum appearance size	LxWxH=150x140x45mm
Weight	260g(without battery)
Number of channels	8
Agreement	ELRS-2.4G
Operating Frequency	2.4GHz (2400-2483.5MHz)
Power	10mW/25mW/50mW/100mW
Battery	1800mAh Lithium Ion Battery
Charging System	Built-in USB 1A linear lithium-ion battery charging system
working voltage	3.7-4.2V
External interface	Type-C, 3.5mm audio interface (wired coach interface)
Other	Support simulator, support joystick calibration, support switching between left and right hands, support firmware update (USB mode), support adjustable power Supports adjustable send/return rates, and supports changing binding keys
Transporter II HD	
Maximum appearance size	LxWxH=145 x 155 x 92mm
Weight	425g(without battery)
Resolution	720*1080
Display Size	4.45"
Battery	Built in a 2200mAh 2C Lithium battery
Voltage	3.7-4.2V
Operating Frequency	5.8GHz (5658-5945MHz)

Charging System	Turn on 5V/3A, turn off 5V/1A charging system
DVR	Suggest using 8-32GB memory TF card (C10 high-speed TF card) Recording formats TS, MOV

Tinyhawk III Plus(Analog)	
Wheelbase	76mm
Maximum appearance size	LxWxH=105x105x45mm
Weight	32.5g (without battery)
Motor	TH0802 II 15000KV
propeller	Avan TH Turtlemode-2
Main control board	STM32F411 (100MHz) main control Integrated 4-in-1-6A-8 bit electrical regulation, input voltage 1-2S On board ELRS (2.4G) receiver (SPI communication)
Camera	RunCam Nano 6
Image transmission	32-bit 40CH open source image transmission Power: 0/25mW/100mW/400mW
Battery	1S HV 650mAh
E8 Transmitter(ELRS-2.4G)	
Maximum appearance size	LxWxH=150x140x45mm
Weight	260g (without battery)
Number of channels	8
Agreement	ELRS-2.4G
Operating Frequency	2.4GHz (2400-2483.5MHz)
Power	10mW/25mW/50mW/100mW
Battery	1800mAh Lithium Ion Battery
Charging System	Built-in USB 1A linearLithium-ion battery charging system
working voltage	3.7-4.2V
External interface	Type-C, 3.5mm audio interface (wired coach interface)
Other	Support simulator, support joystick calibration, support switching between left and right hands, support firmware update (USB mode), support adjustable power Supports adjustable send/return rates, and supports changing binding keys
Transporter II	
Maximum appearance size	LxWxH=155x100x90mm
Weight	398g (without battery)
Resolution	480x800
Display Size	4.3"
Battery	Built in 1300mAh lithium-ion battery
Voltage	3.7V-4.2V
Operating Frequency	5.8GHz (5658-5945MHz)
Charging System	Built-in USB 1A linear lithium-ion battery charging system

DVR	Maximum support for memory 32G TF card File format AV size: VGA/D1/HD (optional)
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Tinyhawk III Plus -RTF HD

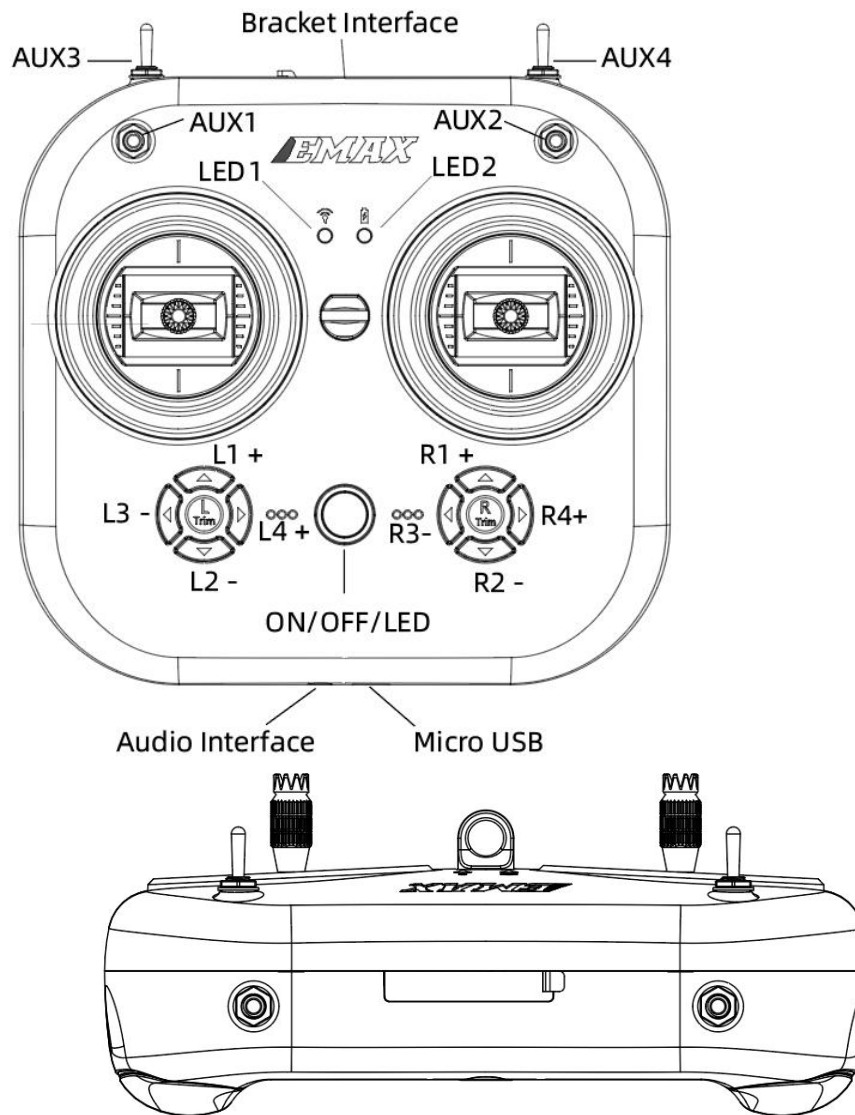
- 1.Tinyhawk III Plus×1
- 2.EMAX E8 Transmitter(ELRS-2.4G)×1
- 3.EMAX Transporter II HD×1
- 4.EMAX 1s HV 650mAh×1
- 5.Charger×1
- 6.Propeller.....(2XCW, 2XCCW)
- 7.Other accessory×1

Tinyhawk III Plus -RTF (Analog)

- 1.Tinyhawk III Plus×1
- 2.EMAX E8 Transmitter(ELRS-2.4G)×1
- 3.EMAX Transporter II×1
- 4.EMAX 1s HV 650mAh×1
- 5.Charger×1
- 6.Propeller.....(2XCW, 2XCCW)
- 7.Other accessory×1

1.E8 Transmitter(ELRS-2.4G)

1.1 E8 Transmitter(ELRS-2.4G)



1.2 E8 Transmitter (ELRS-2.4G) Operation

1.3.1 Binding & Unbinding

Entering Binding Mode for E8 Transmitter (ELRS-2.4G): Firstly, turn on the E8 Transmitter (ELRS-2.4G). Then simultaneously press the "L4+" and "R3-" buttons, hold for 1 second. A prompt sound will be heard, and the central indicator light will alternate between green and red flashing, indicating that the remote controller has entered binding mode.

Entering Unbinding Mode for E8 Transmitter (ELRS-2.4G): Firstly, turn on the E8 Transmitter (ELRS-2.4G) under the condition that it is successfully bound to the flight controller. Then simultaneously press the "L4+" and "R3-" buttons, hold for 1 second. A prompt sound will be heard, and the central indicator light will alternate between green and red flashing, indicating that the remote controller has been unbound from the flight controller.

1.3.2 Button Functions

Pressing the power switch: Powers on and enters the ELRS protocol mode. The mode indicator light will be a steady red.

Pressing the power switch and "L3-" simultaneously: Powers on and enters calibration mode.

Simultaneously pressing "L4+" and "R3-": Enters binding mode.

Pressing "R4+" followed by the power switch (when in power-off state): Enters the serial port flashing mode.

1.3.3 Trim Adjustment

Each joystick has a corresponding trim button. The trim buttons adjust the directions controlled by the respective joysticks. A prompt sound will be emitted each time an adjustment is made. A longer prompt sound will be emitted when adjusted to the center position. Please pay attention to the recognition. When the joystick is centered, the aircraft hovers. Adjust the trim buttons for pitch and roll to achieve a stable hover without needing to adjust the joysticks.

1.3.4 Joystick Calibration

The E8 Transmitter (ELRS-2.4G) comes pre-calibrated, but recalibrating can help resolve certain issues. With the E8 Transmitter (ELRS-2.4G) turned off, simultaneously press the "L3-" button and the power button to turn it on. Wait for the central indicator light to illuminate and transition from rapid flashing to slow flashing. Move the joysticks of the E8 Transmitter (ELRS-2.4G) to their maximum travel in all four directions (up, down, left, right). Press the "L3-" button, a prompt sound will be heard, exiting calibration mode, and the E8 Transmitter (ELRS-2.4G) will boot up.

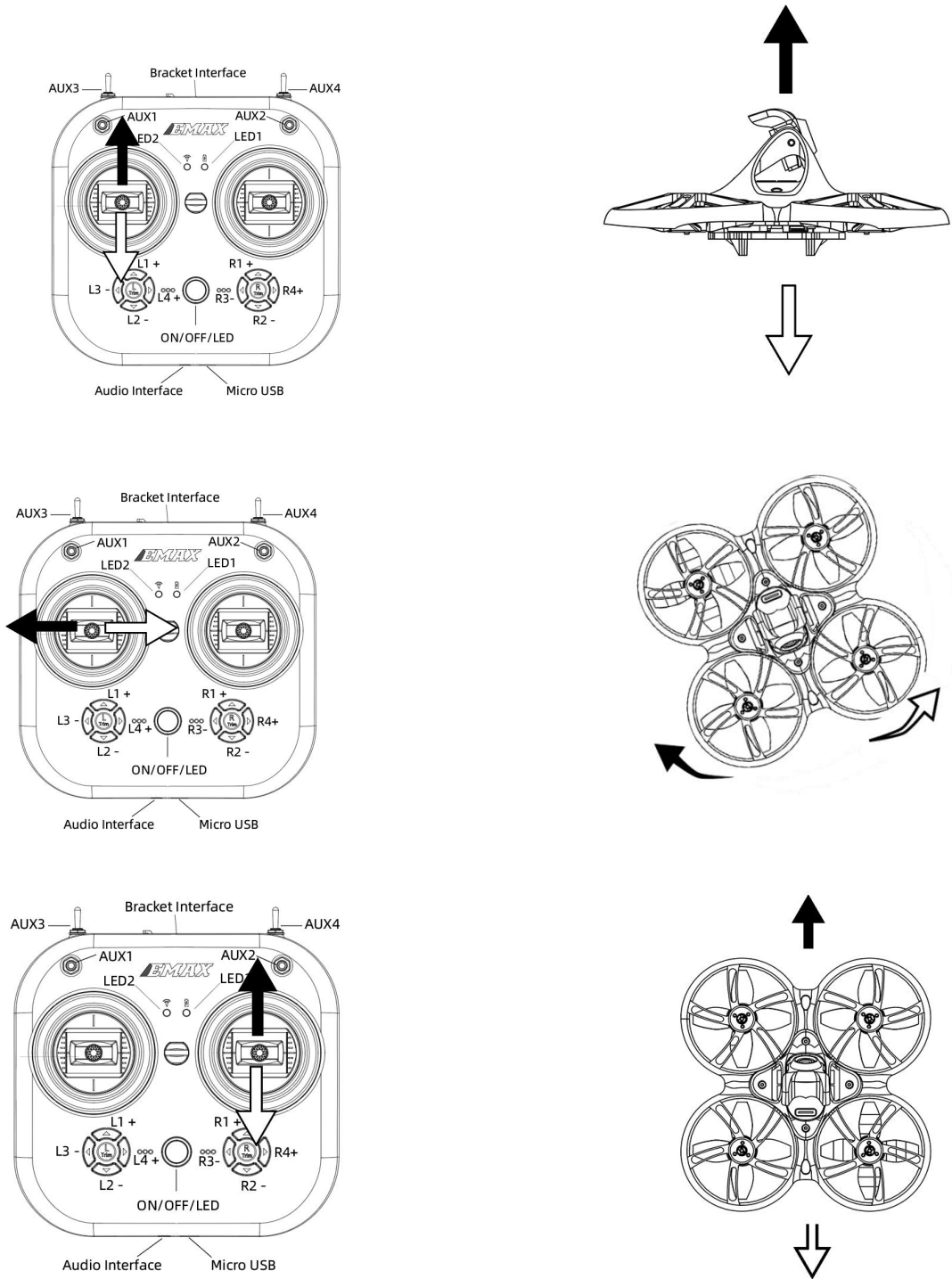
1.3.5 Left and Right Hand Switching

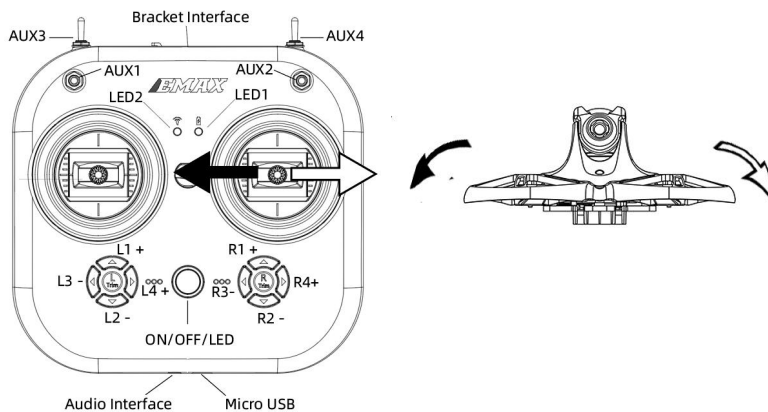
To switch between left and right hand modes, remove the screws and open the back cover of the E8 Transmitter (ELRS-2.4G). On the left side of the board, there is a toggle switch. Set the toggle switch to "L" (left-hand throttle mode) or "R" (right-hand throttle mode), and swap the positions of the joysticks (the 6-pin wires connecting the joysticks to the mainboard do not need to be changed).

In Left Hand Mode: Left joystick on the E8 Transmitter (2.4G) controls the throttle and yaw direction of the Tinyhawk III Plus. The right joystick controls the pitch and roll of the Tinyhawk III Plus.

In Right Hand Mode: Left joystick on the E8 Transmitter (2.4G) controls the pitch and roll of the Tinyhawk III Plus. The right joystick controls the throttle and yaw direction of the Tinyhawk III Plus.

Schematic diagram of the left and right-handed joysticks (the picture shows the left-handed mode, and of the joystick control reversed in the right-handed mode)





1.3.6 Trainer Port & Simulator

Insert one end of a 3.5mm male-to-male cable into the trainer port (3.5mm audio jack) and the other end into a simulator (sold separately) to output corresponding channel values.

Insert a Type-C data cable into the remote controller to output corresponding channel values.

1.3.7 Battery & Charging

The E8 Transmitter (ELRS-2.4G) is designed for a single 18650 battery with an operating voltage range of 4.2V to 3.7V. When reinstalling the battery, slide the battery compartment cover backward, install the battery with the correct polarity (negative terminal on the side of the battery compartment with a spring), ensure a perfect match between the battery compartment cover and the battery compartment, push it forward until it locks. Incorrect battery installation will prevent proper charging and startup.

To charge the remote controller, use the bottom Type-C port for charging. The power charging indicator light's states are as follows:

- Steady red light: Charging in progress

- Steady green light: Charging complete Note: Use a 5V-1A adapter and Type-C cable for charging. When the voltage is low (3.7V), an alert will sound, indicating the need for timely charging.



1. 4E8 Transmitter (ELRS) Serial Upgrade Tool Instructions

1. Firmware Update and Upgrade (Version 4.1)

To initiate the firmware update, follow these steps:

1. Press and hold the R4+ button, then press and hold the power button. A beep will sound, the mode indicator light will flash green, and the central indicator light will stay solid green. This indicates that the transmitter has entered serial flashing mode.
2. Connect the transmitter to your computer using a Type-C data cable.
3. Open the EMAX Serial Upgrade Tool on your computer.
4. Perform the following steps within the upgrade tool: (a) Identify and select the appropriate serial port. (b) Click on "Open Port." (c) Click on "Select File" to choose the firmware file you want to update. (d) Click on "Update File."
5. Wait for a few seconds. When the transmission progress reaches 100%, the transmitter will shut down automatically, indicating that the firmware upgrade has been successful.

Note: If the serial port is not detected, you can try the following:

- Change the data cable.
- Repeat steps (a) and (b).
- Click on the "Refresh Port" option.

- Disconnect and reconnect the Type-C data cable.

1.4.2 Power Switching and Changing Telemetry/Transmission Rate

To switch power levels or modify telemetry/transmission rates, follow these steps:

1. Follow steps (1) from the Firmware Update and Upgrade section.
2. Follow steps (2) from the Firmware Update and Upgrade section.
3. In the parameter configuration section of the upgrade tool, click on "Read Parameters." This will display all the current settings of the transmitter.
Locate the options for transmission rate, telemetry rate, and power within the displayed parameters. Click on the corresponding dialog box for each option. Choose the appropriate parameters that you want to set.
4. After selecting the desired parameters, click on "Write Parameters." Once the writing process is complete, you will see a confirmation indicating the successful modification of the parameters.
5. Power off the transmitter and then power it on again to apply the changes.





11.4.3 Binding Key Modification

To change the binding key, follow these steps:

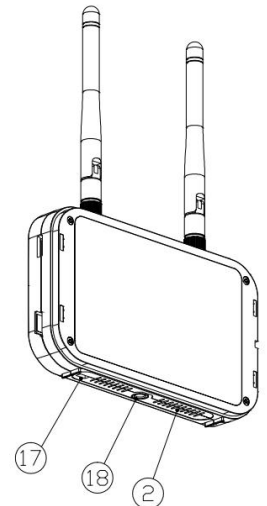
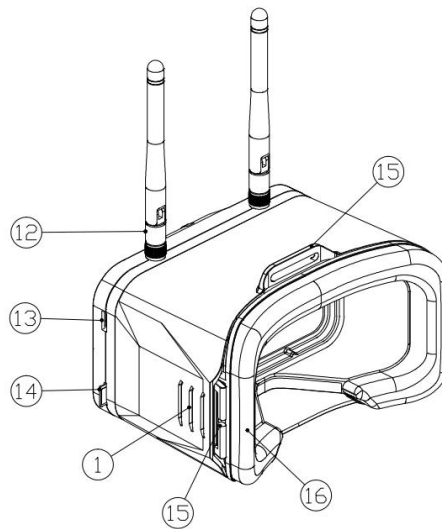
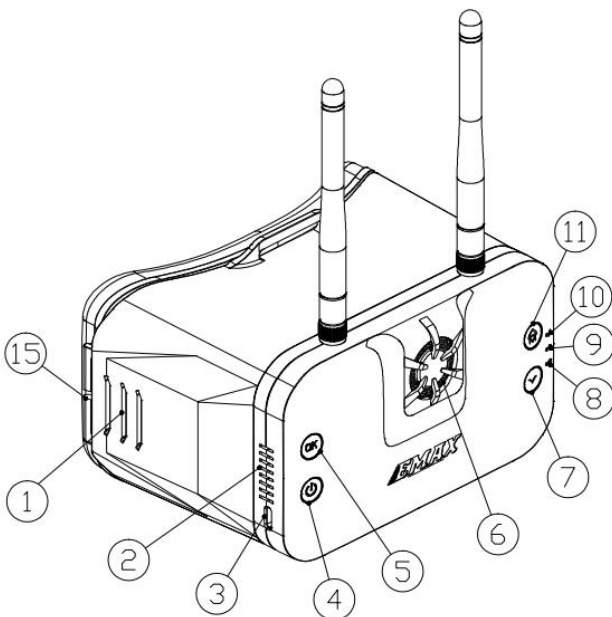
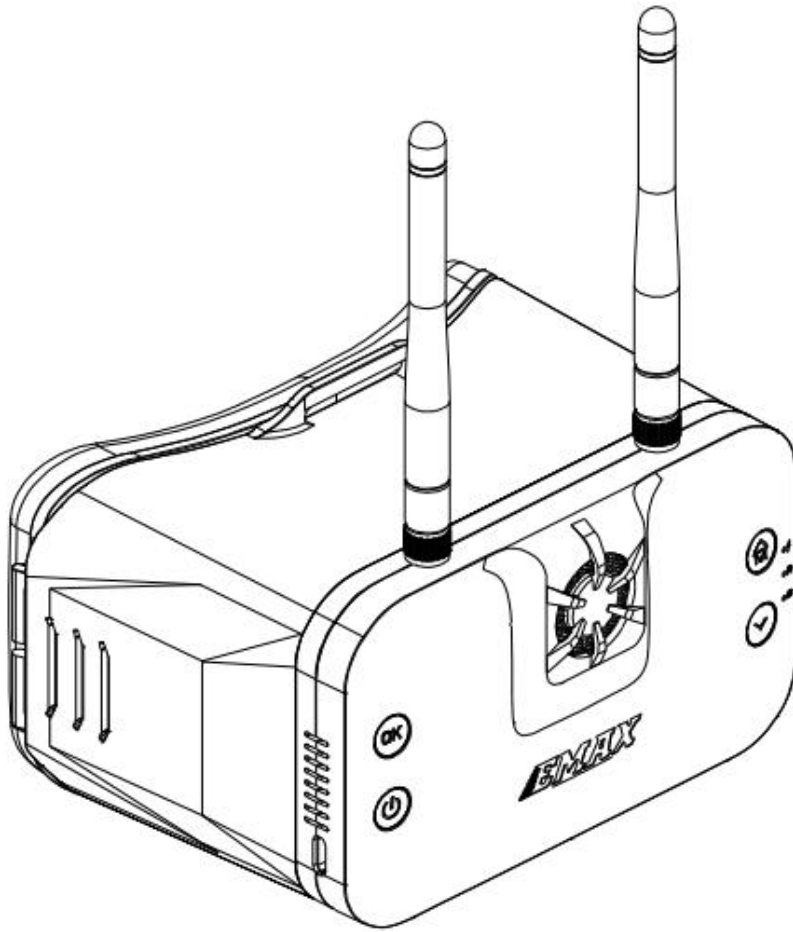
1. Follow steps (1) from the Firmware Update and Upgrade section.
2. Follow steps (2) from the Firmware Update and Upgrade section.
3. In the parameter configuration section of the upgrade tool, click on "Read Parameters." This will display the current binding key configured for the transmitter.
4. If you need to change the binding key, enter the corresponding key in the dialog box next to the existing key. Please note that the key format should be XX, XX, XX, XX, XX (six integers between 0 and 255).
5. After entering the new binding key, click on "Write Parameters." If the writing process is successful, you will receive a confirmation indicating that the binding key has been modified successfully.

(1)

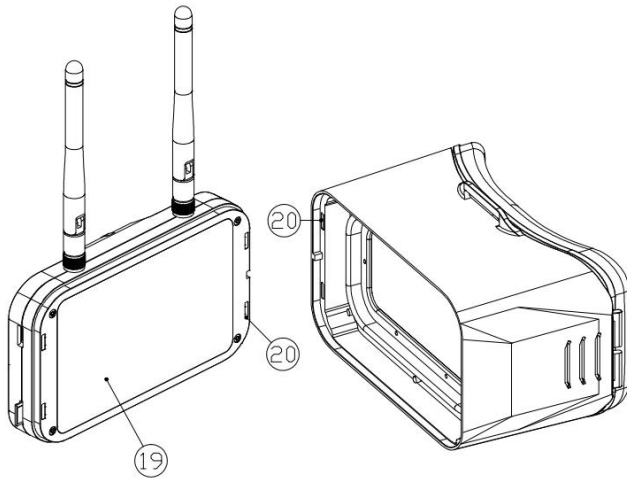
Note: Obtaining the Serial Update Tool: After extracting the "release" file, locate the file named "serial_bootloader.exe." Double-clicking this file will directly launch the tool. You can download the relevant compressed files and firmware update files from the EMAX official website (www.emax-usa.com).

2. Transporter II HD

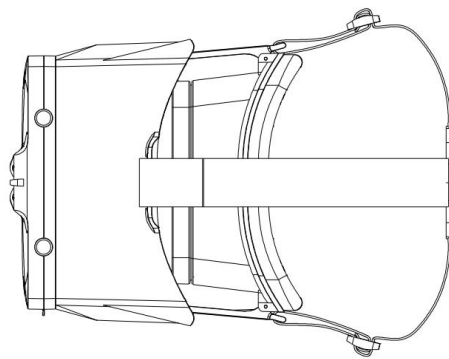
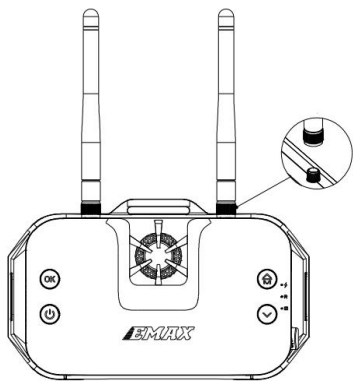
2.1 Transporter II HD

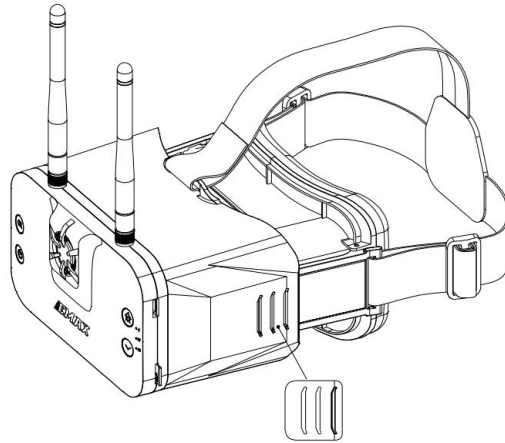


1. Distance adjustment card slot
2. Ventilation port
3. TYPE-C charging port
4. On/Off button
5. Confirm button
6. Fan
7. Down button
8. Firmware update indicator light
9. Recording indicator light
10. Charging indicator light
11. Up/menu button
12. Antenna
13. Firmware upgrade connection port
14. TF (microSD) card connector
15. Headband Hanging Hole
16. Face sponge
17. Boot switch
18. External connection port
19. Display screen
20. Magnet



Flight goggles consist of two main components: the display module and the main body shell. These can be combined together using magnets or separated as needed.





There are three distance adjustment slots, allowing for three different distances to be set. When adjusting, please ensure that the distance adjustment slots on the left and right sides are kept consistent.

2.2 Transporter II HD Specifications

- Weight: Approximately 425g (including head strap and antennas)
- Dimensions: 145 x 155 x 92mm (excluding antennas), 145 x 155 x 190mm (including antennas)
- Screen Size: 4.45 inches
- Screen Resolution: 720 x 1080
- Operating Frequency: 5658-5917MHz (R1-R2-R3-R4-R5-R6-R7-R8-F2-F4, a total of 10 channels)
- Antenna: Equipped with two linear antennas with 3dB gain, compatible with other SMA connector antennas
- DVR Function: Recommended for use with 8-32GB TF cards (Class 10 high-speed TF cards), recording formats in TS and MOV
- Battery: Built-in 2200mAh 2C lithium battery
- Charging System: DC/5V charging (3A when charging in powered-on state, 1A when charging in powered-off state)
- External Power Function: Can be connected to an external power source with 5V 3A (Insufficient current may cause inadequate power supply)
- Warning: Do not use an external power source or power adapter with a voltage higher than 5V, as it may result in damage to the product.

Please note that specifications and features are subject to change without notice.

2.3 Transporter II HD Operation 2.3.1 Button Instructions

- Up/Menu Button:** In SCAN mode, long press to enter preview mode, then long press again to access the menu bar mode. In preview mode, short press to cycle through channels (R1-R2-R3-R4-R5-R6-R7-R8-F2-F4). In the menu bar mode, short press to increase options, long press to exit the current mode. In playback video selection mode, long press to exit the current mode. In playback video mode, short press to rewind the video.

Please refer to the manufacturer's user manual for more detailed instructions on using the Transporter II HD goggles and its various functions.



Down Button: In preview mode, short press to cycle through channels (R1-R2-R3-R4-R5-R6-R7-R8-F2-F4). In preview mode, long press to display the brightness bar. Short press the Down button to decrease screen brightness, and short press the Up button to increase screen brightness. Long press the Down button again to close the brightness bar. In the menu bar mode, short press to decrease options. In playback video mode, short press to play the video forward.

Confirm Button: Short press to confirm selections. In preview 2 and manual recording mode, long press to enter manual recording mode, and long press again to stop recording (During recording: Recording indicator light flashes green, screen recording dot remains red).

Power Button: Long press to power on and enter SCAN mode. Long press again to power off. (In powered-on state, recording indicator light is solid green).

TYPE-C Charging Port: DC/5V charging (Recommended: 5V 3A charging in powered-on state, 5V 1A charging in powered-off state). Can be connected to an external power source with 5V 3A (Insufficient current may cause inadequate power supply).

Warning: Do not use an external power source or power adapter with a voltage higher than 5V, as it may result in damage to the product.

Firmware Update Connection Port: (For updating firmware of VTX, camera, etc.)

Boot Switch: (Note: Keep the switch on the left during normal use.)

TF (microSD) Card Slot: Recommended for use with 8-32GB TF cards (Class 10 high-speed TF cards).

Antenna Connection Port: SMA-KY (external thread, internal hole).

Charging Indicator Light: (Charging status - red light is solid; Full charge status - green light is solid).

Recording Indicator Light: (Powered-on status - green light is solid; Recording status - green light flashes; During firmware update - green light is solid).

Firmware Update Indicator Light: (During firmware update - green light is solid; During Boot update - green light is solid).

Please refer to the manufacturer's user manual for detailed instructions on using the Transporter II HD goggles and its various functions.

2.3.2 System Settings Menu

- **Scan:** Displays the current channel (R1-R8, F2, F4 - a total of 10 channels).
- **Playback:** Accesses the video playback function (displays video count and available TF card capacity).
- **Format SD-Card:** Formats the TF (microSD) card.
- **Record Mode:** Sets the recording mode (Automatic/Manual).
- **Record Format:** Chooses the recording format (MOV/TS format).
- **Record OSD:** Specifies whether to keep the on-screen display (OSD) during recording (Yes/No).
- **Auto Scan:** Enables or disables the auto-scan feature.
- **About:** Displays version information and manufacturer details.

2.3.3 DVR Function

(1) Automatic Recording Mode When the HD goggles meet the following conditions: 1.1 - Valid video signal (not a black screen) 1.2 - Available space on the TF (microSD) card is over 200MB And video signal is connected upon powering on, the goggles will automatically enter the automatic recording mode. During this mode, the "Recording Indicator Light" will flash green, and the "Screen Recording Dot" will remain red, indicating that the goggles are in recording mode.

(2) Manual Recording Mode When the HD goggles meet the following conditions: 2.1 - Valid video signal (not a black screen) 2.2 - Available space on the TF (microSD) card is over 200MB And video signal is connected upon powering on, long-press the "Confirm Button" to enter the manual recording mode. Similar to automatic recording, the "Recording Indicator Light" will flash green, and the "Screen Recording Dot" will remain red, indicating that the goggles are in recording mode. Long-press the "Confirm Button" again to stop recording. During this state, the "Recording Indicator Light" will remain solid green, and the "Screen Recording Dot" will be lit in gray.

Note: When the TF (microSD) card is full, the DVR recording will automatically stop, but real-time video output will not be affected. If no TF (microSD) card is inserted or if there is insufficient memory, video recording will not occur.

2.3.4 TF (microSD) Card

Before use, please perform the formatting operation:

1. Use the "Format" option in the HD goggles' system settings menu for formatting. (Recommended method)
2. If formatting on a computer, select "File System" as "FAT32" and "Allocation Unit Size" as "64KB."
3. It's recommended to use an 8-32GB memory card with a read/write speed of C10 or above.

Note: When formatting the TF card, it is advised to use the "HD Goggles Format Option" for the formatting process.

2.3.5 Screen Brightness Adjustment

In preview mode (including Preview 1 - no video signal, and Preview 2 - with video signal):

- Long-press the "Down Button" to display the brightness bar.
- Short-press the "Down Button" to decrease screen brightness.
- Short-press the "Up Button" to increase screen brightness.
- Long-press the "Down Button" again to close the brightness bar.

2.3.6 Video Playback Function

In the system settings menu, select the "Playback" option, and short-press the "Confirm Button" to enter the "Video Playback Selection Mode." Choose the desired video.

- Short-press the "Confirm Button" to play the video, entering the "Video Playback Mode."
- Short-press the "Up/Menu Button" to rewind the video.
- Short-press the "Down Button" to fast forward the video.
- Short-press the "Confirm Button" to pause the video playback. During pause, long-press the "Up/Menu Button" to go back to the "Video Playback Selection Mode." Long-press the "Up/Menu Button" again to return to the "System Settings Menu Mode."

2.4 Transporter II HD Firmware Update 2.4.1 Firmware Update (Regular Update)

Follow the steps below for the update process:

1. Format the TF (microSD) card and power off the HD goggles.
2. On your computer, extract the Emax Transporter II HD firmware update compressed package to the root directory of the TF (microSD) card.
3. Insert the TF (microSD) card into the HD goggles, power them on. At this point, both the "Recording Indicator Light" and "Firmware Update Indicator Light" will be solid green. Wait for a "Success" or similar prompt; when the indicator lights turn off, it indicates a successful update.

Note:

- During the update process, ensure that the HD goggles are receiving stable power supply.
- Make sure the "Boot Switch" is positioned on the left side, as shown in the figure.



2.4.2 Firmware

Update (Boot Mode)

If the HD goggles are unable to start up normally (e.g., fan running but no image output), switch to Boot Mode for firmware update using the following steps:

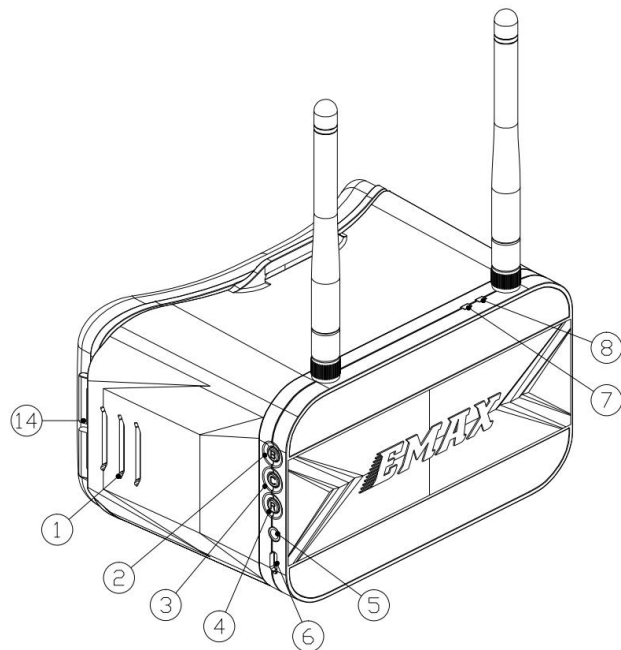
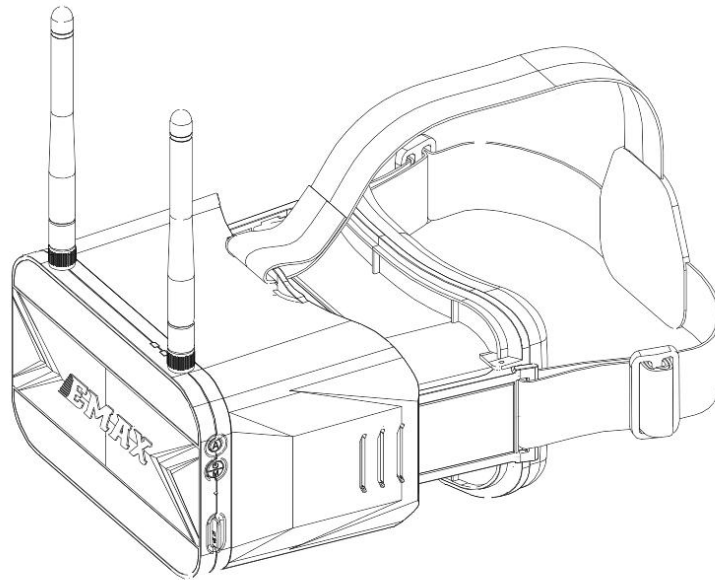
1. Format the TF (microSD) card and power off the HD goggles.
2. On your computer, extract the Emax Transporter II HD firmware update compressed package to the root directory of the TF (microSD) card.
3. Move the "Boot Switch" to the right side, as shown in the figure.

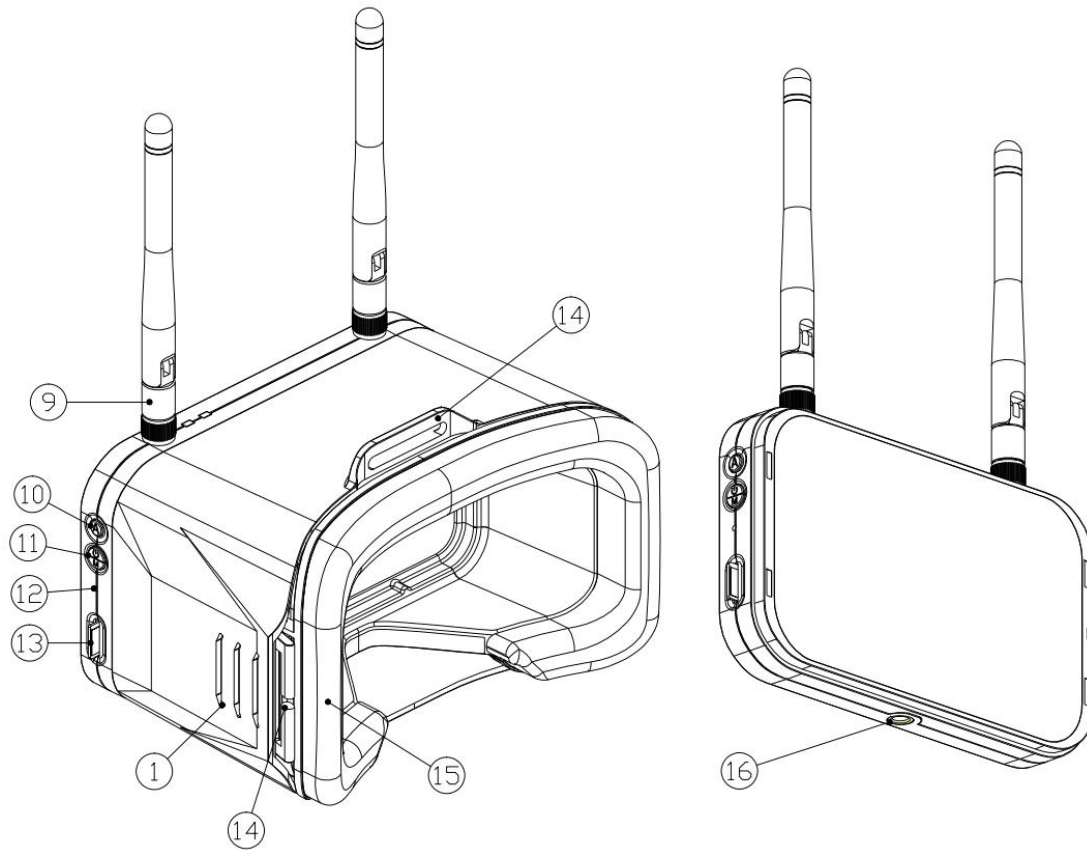


4. Insert the TF (microSD) card into the HD goggles and power them on. The "Firmware Update Indicator Light" will be solid green. Wait for the green light to turn off (this process will take about 5 minutes). Please ensure stable power supply to the HD goggles during the update.
5. After the "Firmware Update Indicator Light" turns off, power off the goggles and move the "Boot Switch" back to the left side. The update is now completed.

3. Transporter II

3.1 Transporter II





1. Distance Adjustment Slot
2. Frequency Band Switch Button
3. Channel Switch Button
4. Recording Button
5. Audio Interface
6. Micro USB Port
7. Recording Indicator Light
8. Charging Indicator Light
9. Antennas
10. Auto Search Button
11. Power On/Off (Long Press) & Menu Button (Short Press)
12. Reset Button
13. SD Card Slot
14. Head Strap Attachment Hole
15. Sponge Pad
16. External Bracket Connection Port

Feel free to reach out if you have any more questions or need further assistance!
Regenerate

Note: To operate the Transporter II correctly, please perform the following

steps: Install the provided antennas onto the SMA connectors. When wearing the goggles, make sure to separate the antennas from the USB power cable used for charging.

3.2 Transporter II Specifications

- Maximum Dimension (excluding antennas, folded state): LxWxH = 155x100x90mm
- Weight (excluding battery): Approximately 398g (including head strap and antennas)
- Screen Resolution: 480x800
- Display Screen Size: 4.3 inches
- Battery: Built-in 1300mAh lithium-ion battery
- Operating Voltage: 4.2V-3.7V
- Operating Frequency: 5.8GHz frequency band (5658MHz-5945MHz)
- Charging System: Built-in USB 1A linear lithium-ion battery charging system
- DVR: Supports up to 32GB TF card, compression format MJPEG, file format AV
- Recording Size: VGA/D1/HD (Three modes available)
- Record Time: Off/3 minutes/5 minutes/10 minutes (Selectable)

3.3 Transporter II Operation

3.3.1 Video Channel Selection

The Transporter II features the Frequency Band Select Button (Button B) and Channel Select Button (Button C). These buttons allow manual selection of the correct frequency band and channel. During cycling through bands/channels, the channel number and frequency will be displayed on the top left corner of the screen.

- **Frequency Band Select Button (B):** Short press to cycle through frequency bands in the sequence A-B-E-F-R. For example, if the current band is E, the first press of Button B will switch to E, the second press will switch to F, the third press will switch to R, and so on in a continuous loop.
- **Channel Select Button (C):** Short press to cycle through the eight available channels in a continuous loop.

Note: Ensure that the Tinyhawk III Plus is powered on and in the correct channel when cycling through frequencies to select the appropriate frequency band and channel.

FR \ CH	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	
A	5865	5845	5825	5805	5785	5765	5745	5725	MHz
B	5733	5752	5771	5790	5809	5828	5847	5866	MHz
E	5705	5685	5665	—	5885	5905	—	—	MHz
F	5740	5760	5780	5800	5820	5840	5860	5880	MHz
R	5658	5695	5732	5769	5806	5843	5880	5917	MHz

Note:

1. Before adjusting parameters, hold down the CH button or FR button for 3 seconds.
2. Ensure that the power of the Tinyhawk III Plus is turned on. When cycling through channels, using the video goggles of the Tinyhawk III Plus will make it easier to identify the correct channel.

Attention: Please make sure the Transporter II is set to the correct channel of the Tinyhawk III Plus. The current selected frequency band and channel of the Tinyhawk III Plus will be displayed on the top left corner of the screen

3.3.2 Video Channel Auto Search

The Transporter II features an "Auto Search" function (labeled "A") to assist in finding the channel of the Tinyhawk III Plus. Power on the Tinyhawk III Plus and then press the "A" button on the Transporter II to initiate the auto search mode. This mode will scan through all channels and select the one with the best video reception. Once all channels are scanned, the best channel number, frequency group, and frequency will be displayed on the top left corner of the screen.

Warning: If multiple Tinyhawk III Plus drones (or other drones with video transmission) are operating simultaneously, using this function might lead to selecting the wrong drone's channel. We recommend manually selecting the correct channel to avoid incorrect matching!

For comprehensive guidance on using the Auto Search function and other features, refer to the manufacturer's user manual for the Transporter II goggles.

3.3.3 Recording On & Off

- To start recording: While in DVR working mode, short-press the right-side R button. A solid red dot will appear at the top-center of the screen, and the DVR's red LED will remain lit. After a moment, the red dot on the screen will begin blinking, and the DVR's red LED will also blink, indicating recording mode has been activated.
- To stop recording: While the DVR is recording, short-press the R button. The red dot on the screen will disappear, and the DVR's red LED will turn off.

Setting Recording Duration:

- Access the Recording Parameter Settings by selecting "Loop Recording" through the B/C buttons.
- Short-press the B/C buttons to choose between 3 minutes, 5 minutes, 10 minutes, or "Off."

3.3.4 Recording Parameter Settings

- Short-press the left-side M button to access the Screen/Recording Parameter Settings menu (requires separate purchase of TF card).
- Press the left-side M button again to select the Recording Parameter Settings submenu. Each press of the M button cycles through the submenu options.
- Short-press the right-side B/C buttons to choose appropriate parameters.

3.3.5 Screen Parameter Settings

- Press the single M button to open the menu, where you can adjust brightness, contrast, saturation, and language settings.
- In the menu, press the M button again to select the next menu option.
- Highlight the current selection in the menu and use the B and C buttons to adjust values up and down.
- If no button input is detected, the menu will automatically close after 3 seconds.

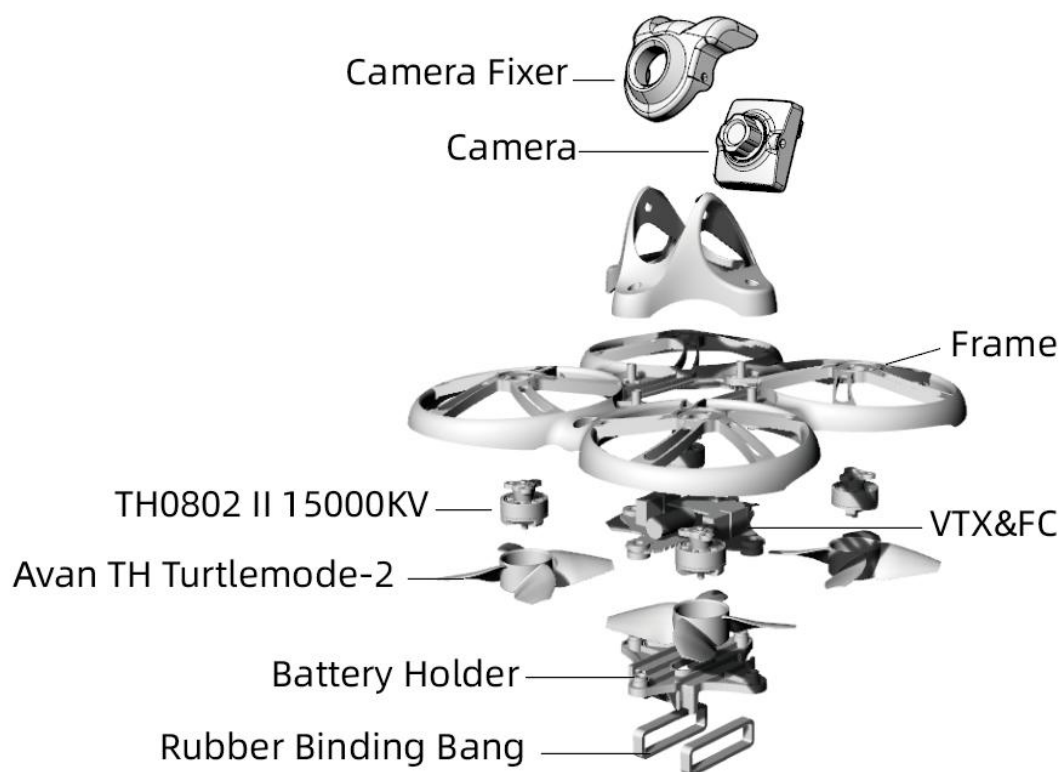
3.3.6 Battery & Charging

- Transporter II comes with an internal 1300mAh lithium battery. For battery replacement, please contact us or visit our official website for assistance. Do not open the back cover yourself to avoid damaging the product.

- Charge using a 5V-1A adapter and a micro USB cable. Charging indicator status:
 - Solid red light: Charging in progress.
 - Solid green light: Charging complete.
- Note: The battery level is displayed on the upper right corner of the Transporter II screen. When "Low Battery" is displayed, promptly charge the device, as the Transporter II will shut down within two minutes if the battery is critically low.

4. Tinyhawk III Plus

4.1 Tinyhawk III Plus



4.2 Tinyhawk III Plus Propellers

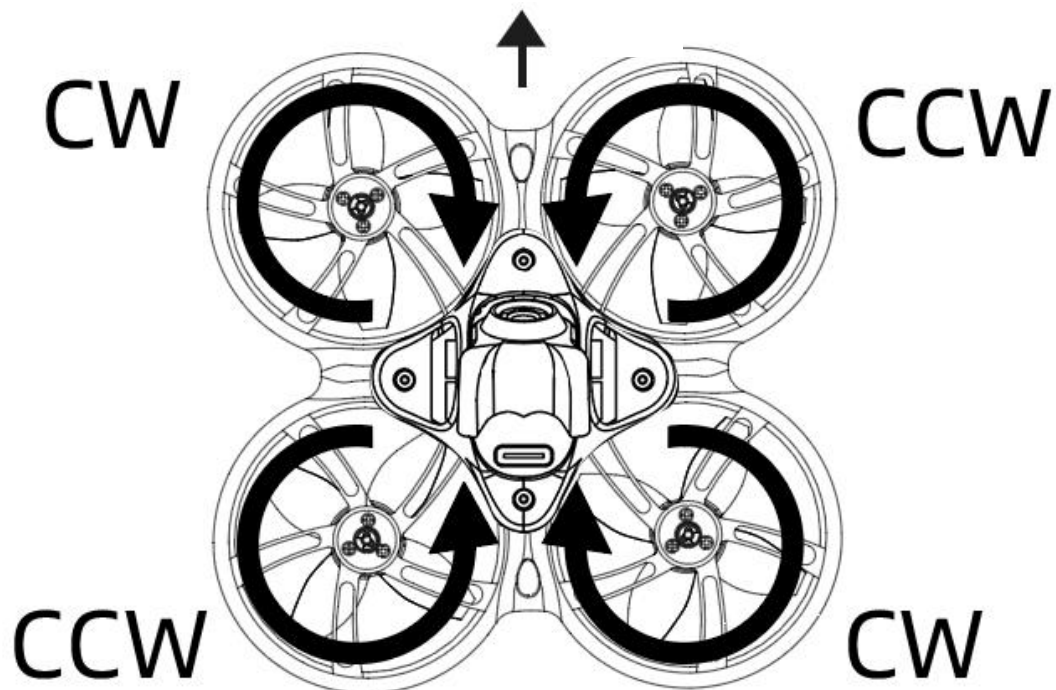
Tinyhawk III Plus propellers come in two rotation directions: Clockwise (CW) and Counterclockwise (CCW). When purchasing a set of propellers, ensure you buy 2 propellers of each rotation direction (2 CW and 2 CCW). The propellers rotate along the blunt edge. When installing the propellers, follow the correct orientation as shown in the diagram.

1. Propeller Installation Align the three tabs of the propeller with the three tabs of the motor, supporting the motor from behind. Press the propeller blades in with your hand until they are flush with the motor shaft.

Warning: Incorrect propeller installation can lead to improper flight and loss of control of the Tinyhawk III Plus. Double-check the propeller orientations for accuracy. If the motor is not supported properly, it might lead to frame breakage. Always prioritize safety when installing propellers.

2. Propeller Removal To remove propellers, use a small tool like a 1.5mm hex driver or a small screwdriver to press against the metal bottom of the motor and the Tinyhawk III Plus frame. Hold the propeller blade with your fingers and gently pry it off the motor until it pops out.

Warning: Propeller removal is only necessary when replacing with new propellers. Be cautious while removing propellers and using tools to ensure safety.



4.3 Tinyhawk III Plus Camera

The Tinyhawk III Plus comes with two camera versions:

(1) HD Camera Version The HD camera version uses the RunCam HDZERO Nano Lite camera.

(2) Analog Camera Version The analog camera version uses the RUCAM Nano 6 camera.

4.4 Tinyhawk III Plus Video Transmission

The Tinyhawk III Plus offers two versions of video transmission:

(1) HD Digital Video Transmission The HD digital video transmission version uses the HDZero Whoop Lite system and is paired with the HD camera version.

(2) 32-bit Open Source Analog Video Transmission The 32-bit open-source analog video transmission version is paired with the analog camera version.

4.4.1 HD Digital Video Transmission (HDZero Whoop Lite)

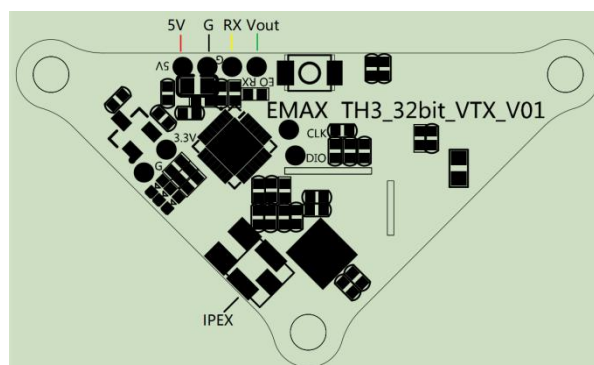
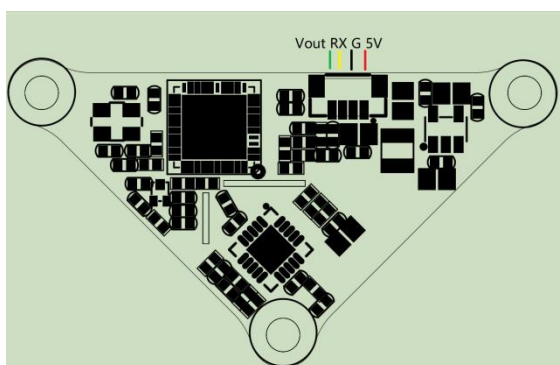
The HD digital video transmission is facilitated by the HDZero Whoop Lite system.

For more detailed instructions on using the HDZero Whoop Lite system, refer to its instruction manual.

4.4.2 EMAX 32-bit Analog Video Transmission

The specifications of the 32-bit analog video transmission are as follows:

- Frequency: 5.8GHz, 40 channels
- RF Power: 0mW / 25mW / 100mW / 400mW
- Power Input: 5V
- Other: Supports Smartaudio protocol, can update VTX firmware via the flight controller.



4.5 Changing Video Transmission Settings

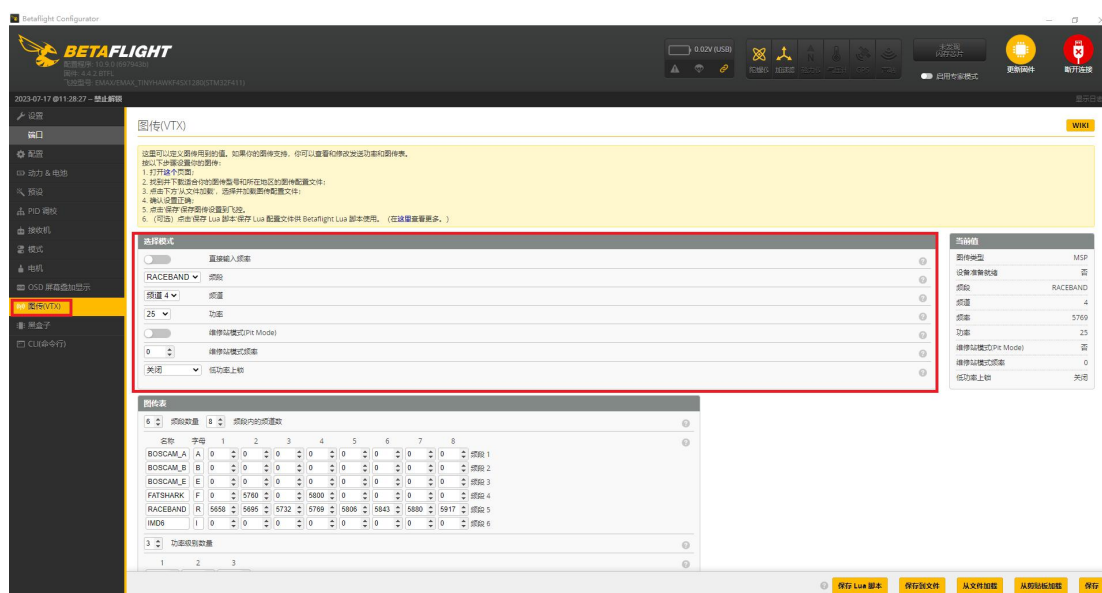
The default video transmission settings for the Tinyhawk III Plus are R:4:25mW. If you wish to change these settings, follow these steps:

1. Open the Betaflight Configurator software.
2. Navigate to the video transmission settings.

3. Adjust the desired parameters such as channel, frequency, power, and low-power lock.
4. After making the desired changes, click "Save."
5. Once saved, restart the Tinyhawk III Plus to apply the new settings.

Note: The process for changing video transmission settings is the same for both the HD and analog versions of the Tinyhawk III Plus.

Low Power Lock Functionality The "Low Power Lock" function ensures that the video transmission operates at low power until it is unlocked. Once unlocked, the transmission operates at the set power level.

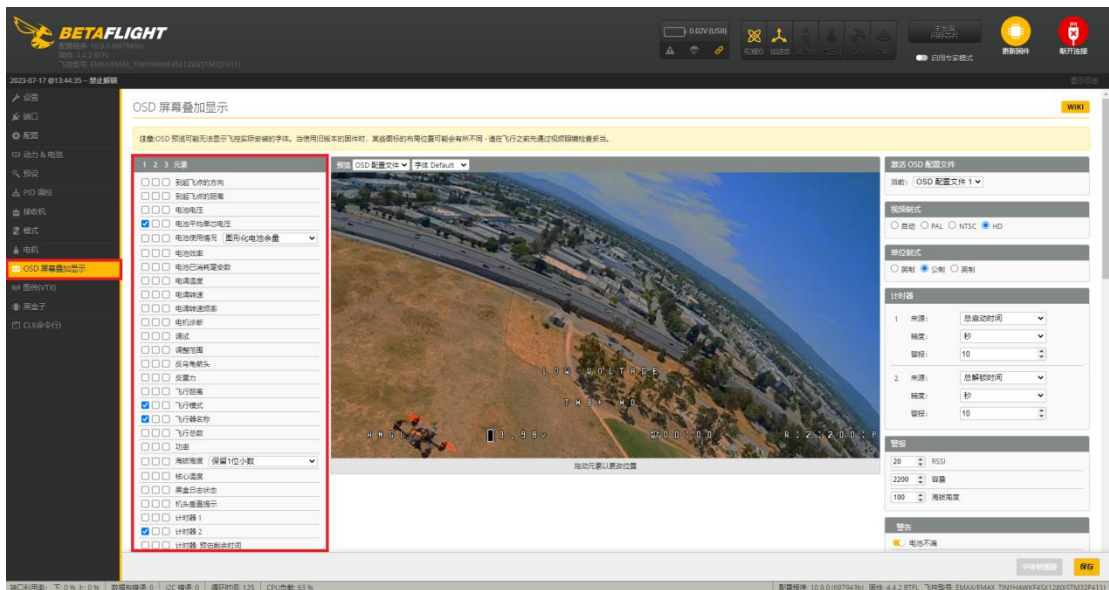


4.6 Changing OSD Settings

The OSD (On-Screen Display) settings for the Tinyhawk III Plus come pre-configured from the factory. However, if you wish to make changes, you can follow these steps using the Betaflight Configurator software:

1. Open the Betaflight Configurator software.
2. Navigate to the OSD settings.
3. Adjust the OSD settings according to your preferences for the characters and information you want to display on your video goggles.
4. After making the desired changes, click "Save."
5. Once saved, restart the Tinyhawk III Plus to apply the new OSD settings.

Note: The process for changing OSD settings is the same for both the HD and analog versions of the Tinyhawk III Plus.



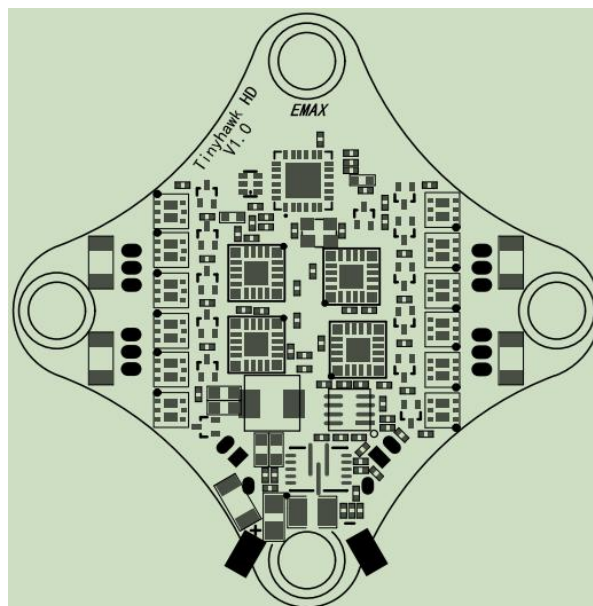
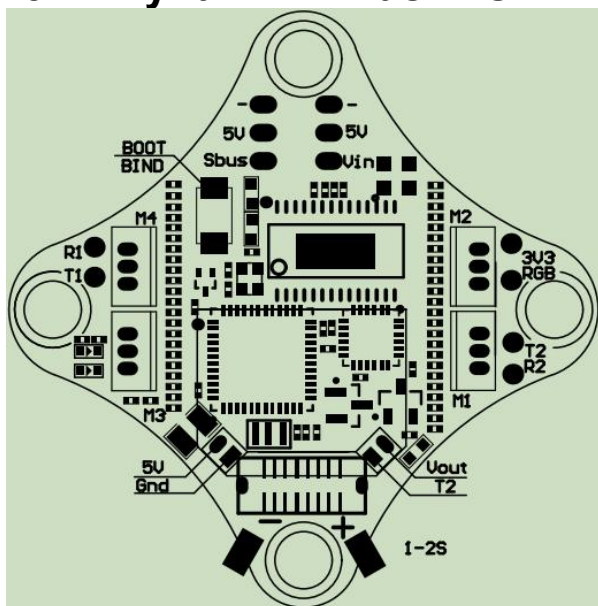
(2) Changing VTX Settings via Betaflight OSD

The Tinyhawk III Plus comes equipped with SmartAudio, which is pre-configured for your convenience. The analog video transmitter (VTX) SmartAudio is on UART2 TX, and the digital video transmitter SmartAudio is on UART1. To change VTX settings, follow these steps:

1. Power on the Tinyhawk III Plus, Transporter II (or Transporter II HD), and E8 Transmitter.
2. Follow the on-screen prompts to access the main setup menu. Keep the throttle centered, yaw to the left, and pitch up (THROTTLE MID + YAW LEFT + PITCH UP) to enter the OSD parameter adjustment menu.
3. In the menu interface, use the pitch (PITCH) control to navigate and select menu options. Move the cursor to "FEATURES" and use the roll (ROLL) stick to move to the next menu.
4. Use the pitch (PITCH) stick to move the cursor to "VTX SA." Then, use the roll (ROLL) stick to enter the VTX configuration menu.
5. In the VTX SA menu, you can configure BAND, CHAN, and POWER settings. Use the pitch (PITCH) stick to move the cursor up and down and select the VTX option you want to configure.
6. Once the parameters are set, move the cursor to "SET" and use the roll (ROLL) stick to enter "SET." Select "YES" to confirm, then use the roll stick again to save the settings.
7. In the VTX SA menu, move the cursor to "CONFIG" to enter the menu. Move the cursor to "PIT FMODE," use the roll (ROLL) stick to turn off the VTX power.

5. Tinyhawk III Plus- AIO

5.1 Tinyhawk III Plus-AIO

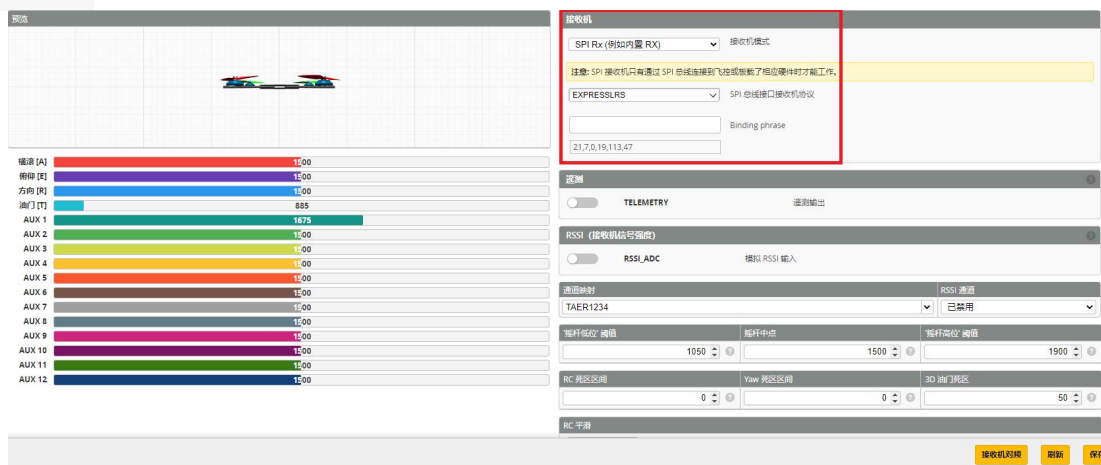


The Tinyhawk III Plus Plus-AIO integrates: ELRS (2.4G) receiver, 6A BIHeliSuite ESC, and F4 flight controller all-in-one board.

5.2 Tinyhawk III Plus

5.2.1 EMAX ELRS(2.4G)

5.2 Tinyhawk III Plus Receiver 5.2.1 EMAX ELRS (2.4G) Receiver Specifications The Tinyhawk III Plus receiver features an onboard ELRS (2.4G) receiver with an SX1280 RF module. The communication method is SPI, equipped with a ceramic antenna (3dB gain). It operates in the frequency range of 2400-2480MHz. The reception protocol is CRSF, and the protocol version is ELRS V3.0.



5.2.2 Binding the Tinyhawk III Plus with the Remote Controller

Binding, also known as pairing, is the process of establishing a connection between the receiver and the remote controller. One receiver can be bound to one remote controller, while a single remote controller can be bound to multiple receivers.

The E8 Transmitter (ELRS-2.4G) is already bound to the Tinyhawk III Plus included in the RTF kit. If necessary, follow these steps to bind (assuming you have not changed the binding key):

- 1. Enter Binding Mode on the Flight Controller (Tinyhawk III Plus):**
 - Power on the Tinyhawk III Plus.
 - Press and hold the Bind button on the Tinyhawk III Plus flight controller. The blue LED indicator on the flight controller will start blinking and then stay solid, indicating it's in binding mode.
- 2. Enter Binding Mode on the E8 Transmitter (ELRS-2.4G):**
 - Turn on the E8 Transmitter (ELRS-2.4G).
 - Simultaneously press and hold the "L4+" and "R3-" buttons on the E8 Transmitter for about 1 second until the center LED indicator alternates between green and red blinking. This indicates that the remote controller is in binding mode.
- 3. Binding Confirmation:**
 - Observe the Tinyhawk III Plus flight controller's blue LED, which will change from solid to blinking.
 - At this point, the LED indicators on the E8 Transmitter (ELRS-2.4G), specifically the "L4+" and "R3-" buttons, will go from blinking back to solid.
 - This change in LED status on both devices confirms the successful binding.
- 4. Exit Binding Mode:**
 - To exit binding mode, disconnect the battery from the Tinyhawk III Plus, cutting power to the flight controller.

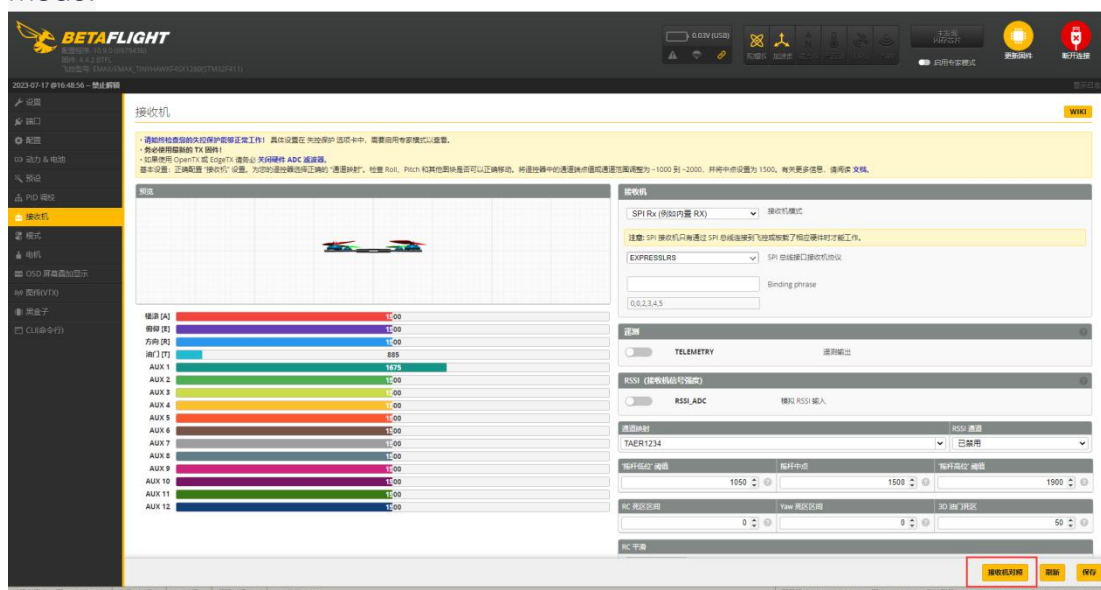
Note: The binding process between the remote controller and receiver doesn't need to be repeated unless you replace either of the devices.

Please make sure to follow these steps carefully to ensure a successful binding process. If you have any further questions or need assistance, feel free to ask!

5.2.3 Other Binding Methods for Tinyhawk III Plus

(1) You can put the receiver into binding mode using the Betaflight Configurator command. Type the following command in the CLI tab: bind_rx, then press Enter. The receiver will enter binding mode.

(2) You can also enter the Betaflight Configurator, go to the Receiver section, and click on "Bind" for the receiver. This will put the receiver into binding mode.



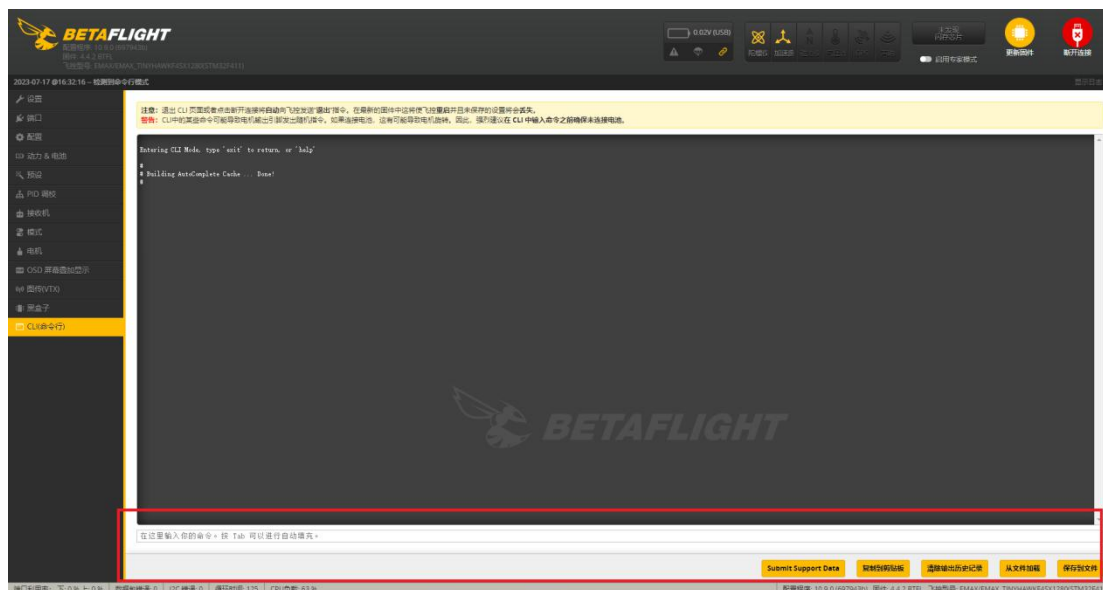
5.2.4 Changing Flight Controller Binding Key

Using both the Betaflight Configurator software and the EMAX UART Upgrade Tool, you can read the current binding key from the aircraft and the remote controller. You can then write the aircraft's binding key to the remote controller using the EMAX UART Upgrade Tool, or write the remote controller's binding key to the flight controller using the Betaflight Configurator software.

To change the flight controller's binding key through the Betaflight Configurator software, follow these steps:

1. Input the following command in the command line (using 0, 1, 2, 3, 4, 5 as an example for the key): set expresslrs_uid = 0,1,2,3,4,5 Save
2. Press Enter and wait for the flight controller to reboot and enter the Betaflight Configurator.

This process will successfully modify the binding key.



5.3 Tinyhawk III Plus ESC

The Tinyhawk III Plus ESC is an integrated 4-in-1 8-bit 6A ESC.

Maximum peak current: 6.7A;

MCU: EFM8BB21F16G;

Input voltage: 1-2S;

ESC firmware: JESC_SH90_48_2_3.HEX;

Supported signal protocols: D-Shot150, D-Shot300, D-Shot600, Multishot, OneShot125, PWM.

5.4 Tinyhawk III Plus Flight Controller

MCU: STM32F411CEU6 (100MHz);

MPU: ICM20689 or ICM42688 (SPI connection);

Supports OSD (AT7456E);

Power input: 1-2S;

Supports BB buzzer, programmable RGB LEDs;

2 UART ports (UART1/UART2);

Onboard 5V/2.5A BEC, 3.3V/300mA BEC;

Firmware: EMAX_TINYHAWKF4SX1280.

5.5PID

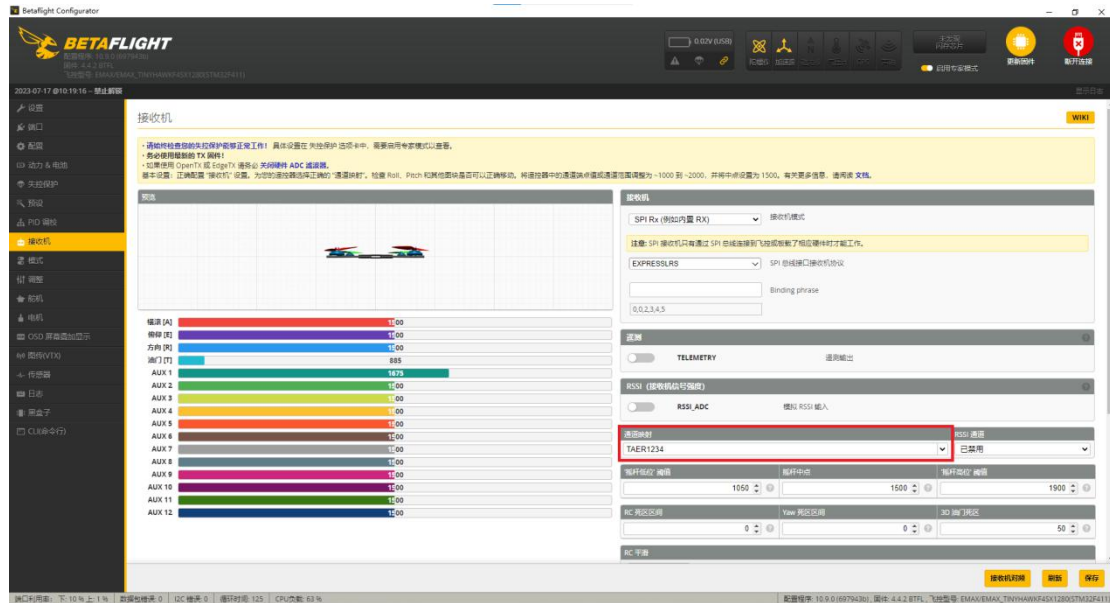
The screenshot shows the Betaflight Configurator PID Tuning page. At the top, there are buttons for 'PID 配置文件 1' and 'Rate 配置文件 1'. Below this is a table of PID parameters for ROLL, PITCH, and YAW. The YAW row is highlighted in blue. The table has columns for Proportional, Integral, D Max, Derivative, and Feedforward. Below the table are sliders for various parameters like D gain, P gain, and feedforward. At the bottom, there is a table for auto rates.

Mode	DPY	低	默认	高
阻尼	2			
D 增益				
增益	1.55			
P 与 速率				
损坏阈值	1			
FF 增益				
姿态增益	0.2			
速率				
速率增益	1.6			

名称	模式	速率
自旋模式	默认	50
半自旋模式	默认	50
速率增益	默认	75

5.6 Adjusting channel settings through the Betaflight Configurator software

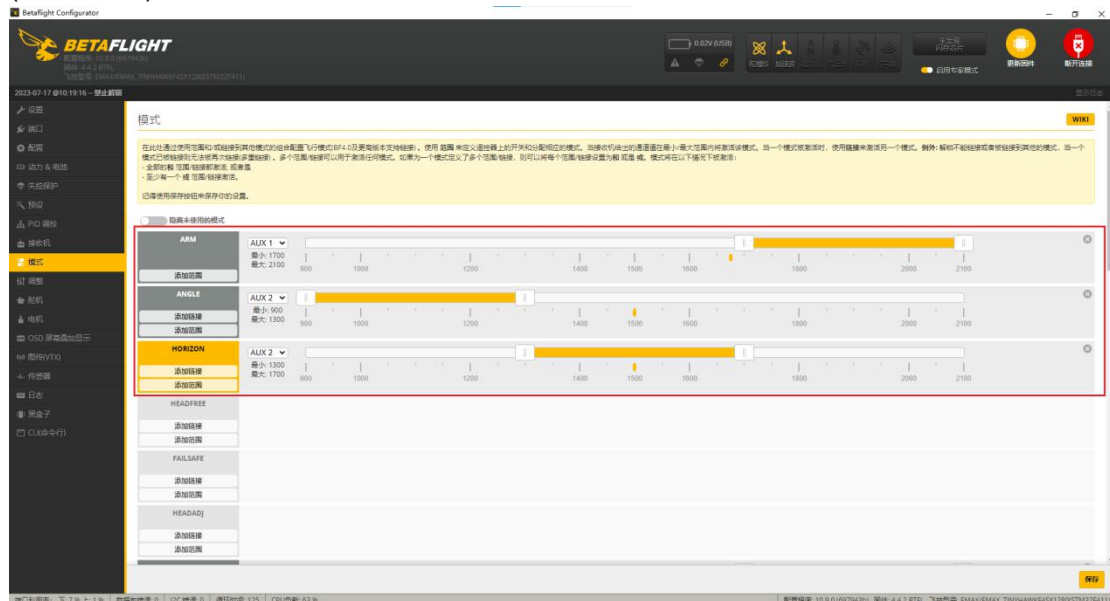
The Betaflight Configurator can be used to change the programming settings of Tinyhawk III Plus. The Betaflight configurator and flight controller firmware can be found in the <https://github.com/betaflight/> Obtain.The Tinyhawk III Plus is factory configured as a channel diagram for TAER1234.



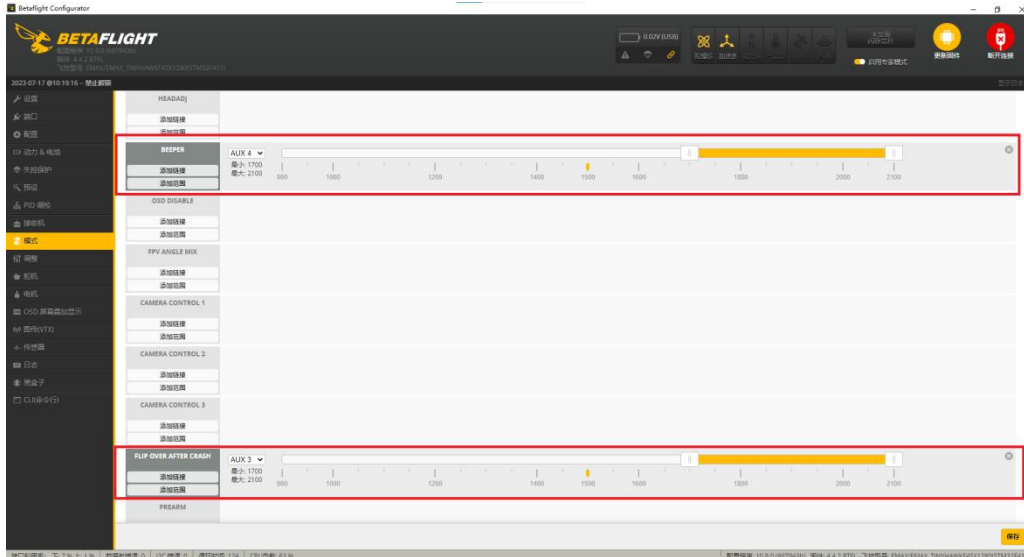
Taking the E8 Transmitter (ELRS-2.4G) as an example:

AUX 1 is a three-level switch, which is an unlock switch (ARM);

AUX 2 is a three-level switch, which is used for flight modes such as Acro (manual), Horizon (semi self stable), and Angle (selfstable);

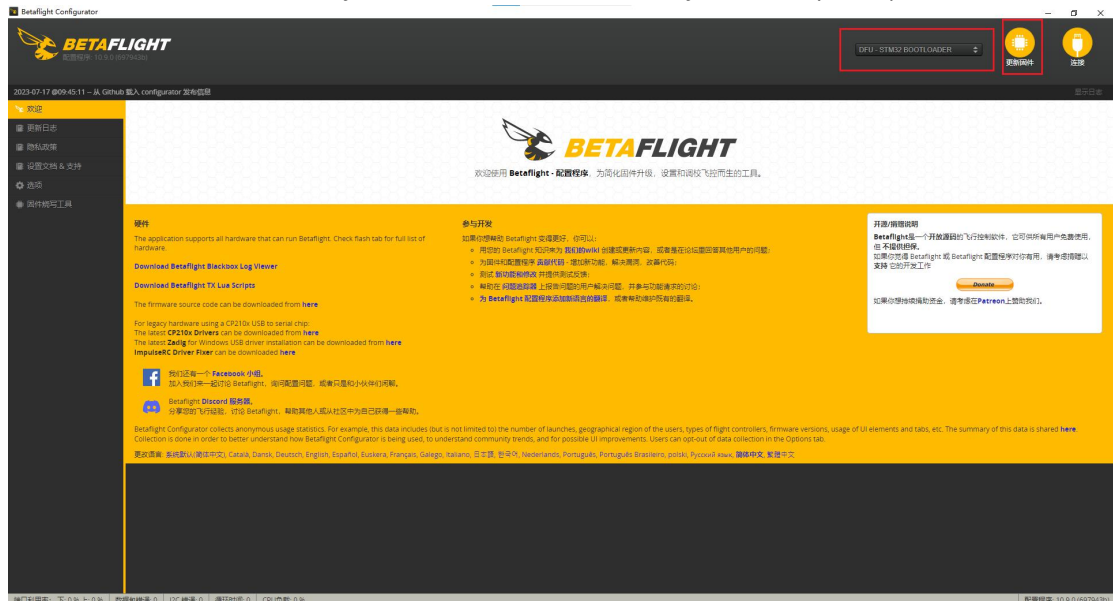


AUX 3 is a 2-stage switch configured for FLIP Over After CARSH mode;
 AUX 4 is a two-stage switch configured as a buzzer (BEEPER);
 Configure your E8 Transmitter (ELRS-2.4G) using the above method, or change these settings in the Betaflight Configurator.



5.7 Flashing Flight Controller Firmware

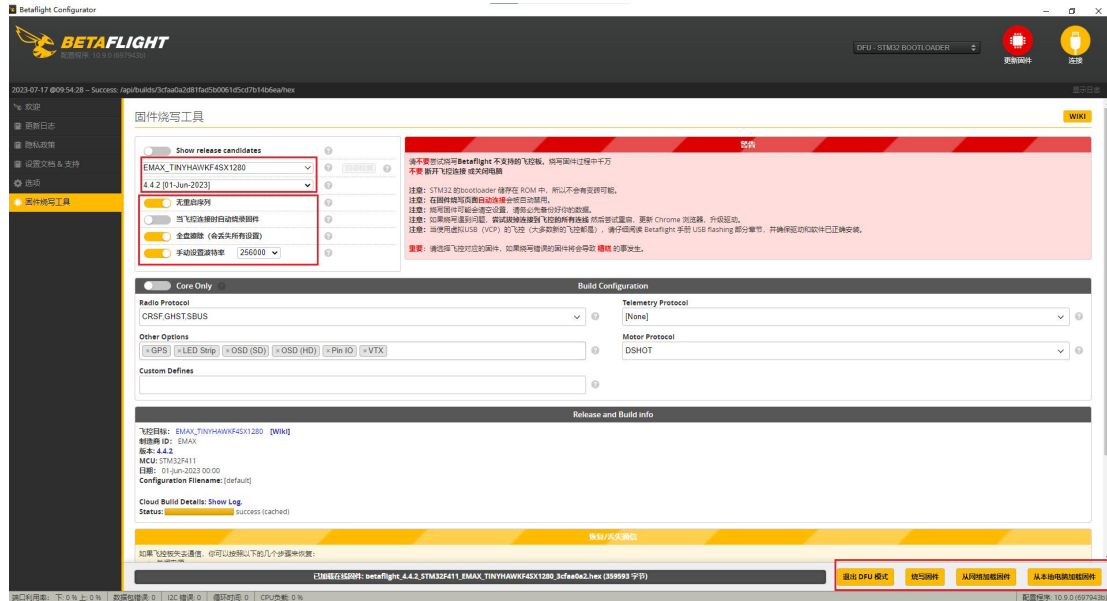
(1) Locate the Boot button on the flight controller board. While holding down the Boot button, connect the flight controller to your computer using a Type-C data cable to enter DFU mode. Then click on "Update Firmware" (if you encounter issues entering DFU mode, check the data cable and ensure that the necessary drivers are installed on your computer).



(1) Choose "EMAX_TINYHAWKF4SX1280, 4.4.2" as the firmware and select a manual baud rate of 256000 from the dropdown menu.

(2) Select either "Load Firmware from Online" or "Load Firmware from Local Computer" and wait for the download to complete.

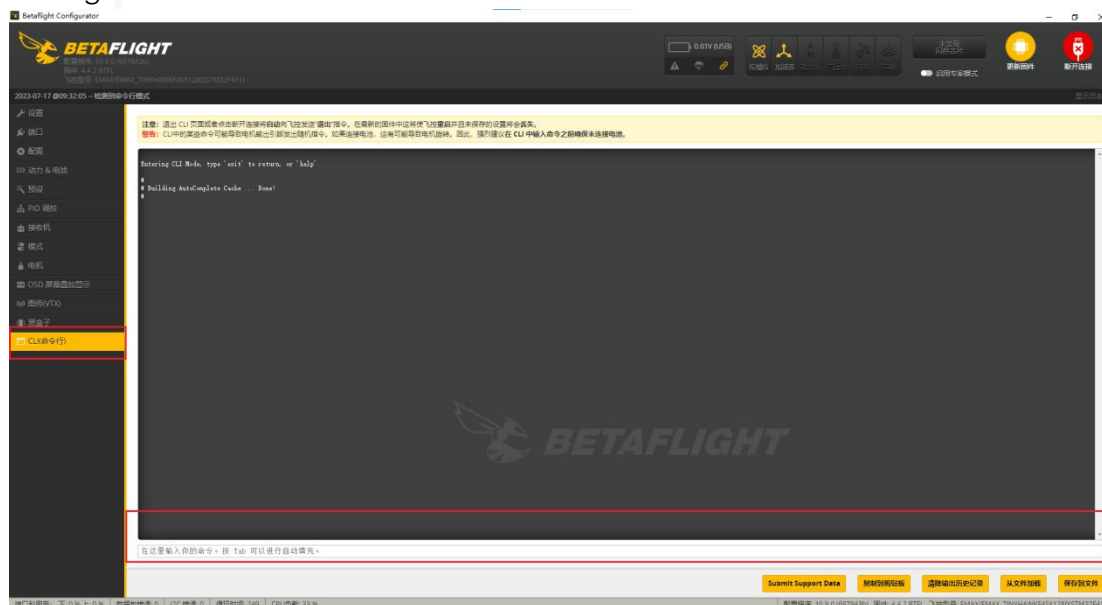
(3) Finally, click on "Flash Firmware" and wait for a few seconds for the flashing process to complete.



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

5.8 Flashing Flight Controller Parameters

Download the latest CLI Dump file from <https://emax-usa.com/>. Open the CLI Dump file in a text editor, copy all the text, paste the settings into the command bar, and press Enter. Once completed, reconnect to the Betaflight Configurator, and the Tinyhawk III Plus will be restored to default settings.



Disclaimer:

The Tinyhawk III Plus has been optimized to its best state. Changing PID settings may affect flight time, overall speed, aircraft control, and motor overheating. We do not recommend altering any PID settings or upgrading firmware to new versions for the Tinyhawk III Plus.

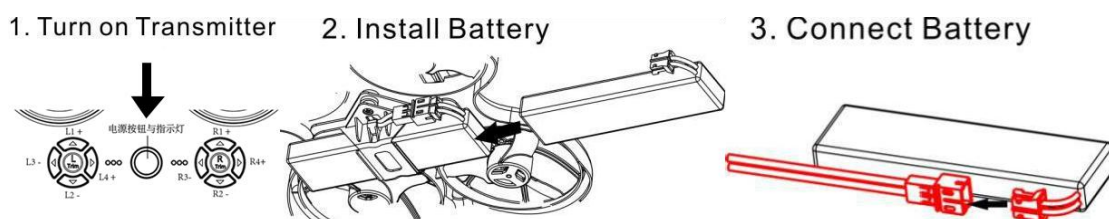
6. Tinyhawk III Plus

Plus Before starting your flight, make sure to learn flight control and then power on for flight. Always exercise caution while flying and operate in open and controlled areas.

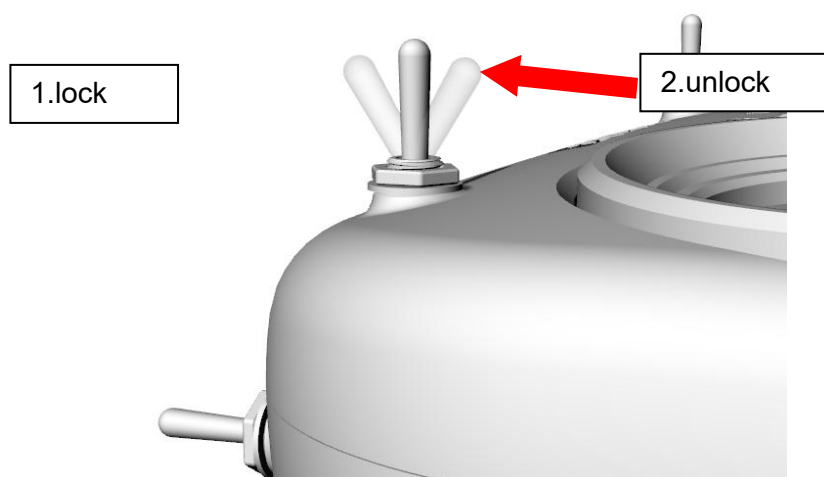
Begin by powering on the E8 Transmitter (ELRS-2.4G) and the Transporter II HD (or Transporter II). The Tinyhawk III Plus is already bound to the E8 Transmitter (ELRS-2.4G) and matched to the correct video channel on your Transporter II HD (or Transporter II). Power on the Tinyhawk III Plus by sliding the battery into the battery tray and connecting the power. Once the battery is inserted, place the Tinyhawk III Plus on a level and stable surface for calibration.

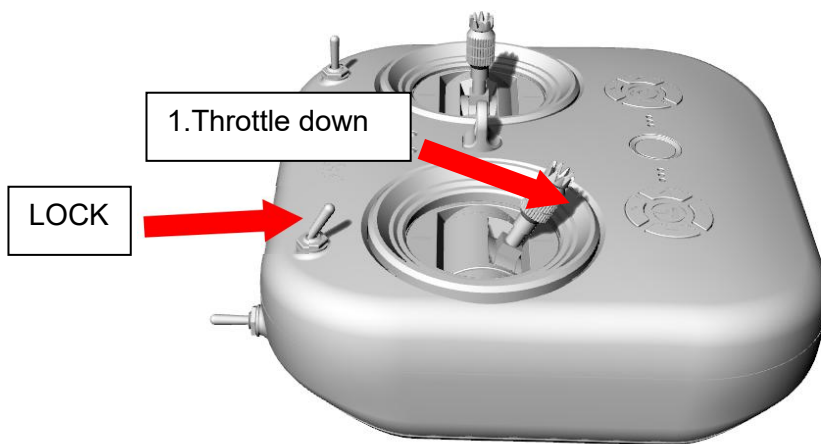
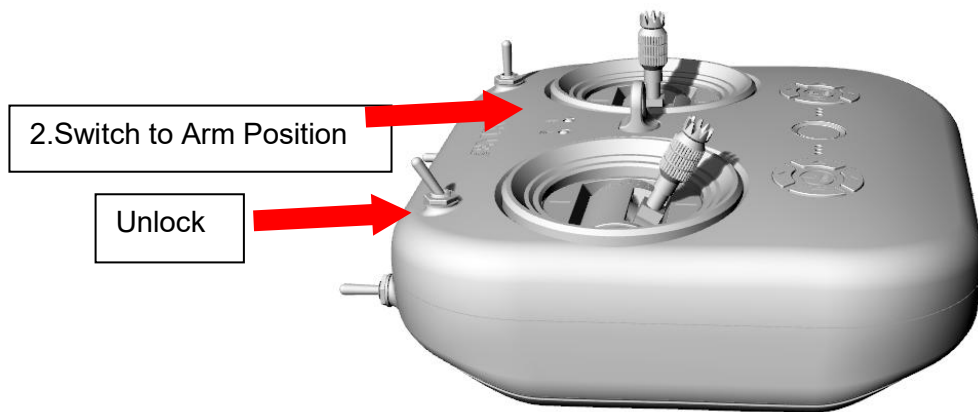
Calibration takes a few seconds, and then the Tinyhawk III Plus is ready to fly. With a fully charged battery, the Tinyhawk III Plus can fly for around 4 minutes. When the battery voltage reaches 3.2V, it's recommended to land the Tinyhawk III Plus promptly; flying further could seriously damage your battery, and EMAX does not advise such operation.

Regenerate



6.1 UNLOCK





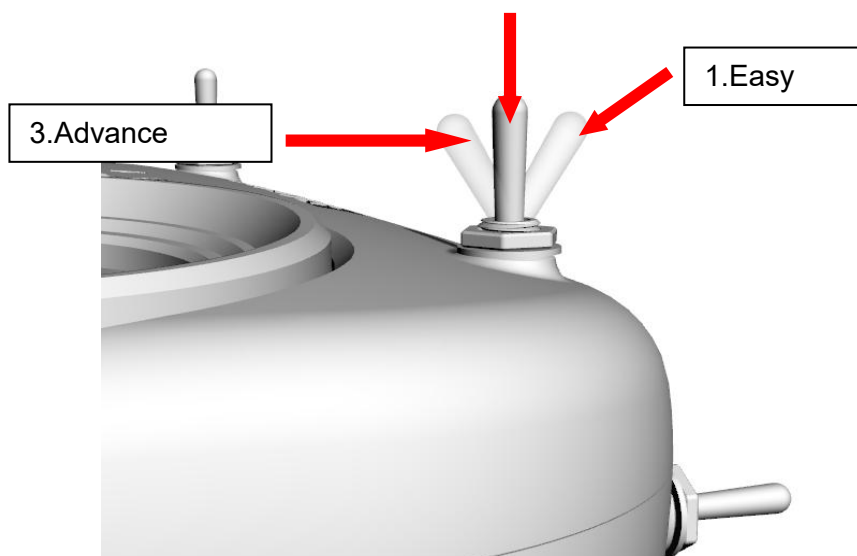
Unlocking means preparing the Tinyhawk III Plus for takeoff. When the Tinyhawk III Plus is powered on for the first time, the propellers won't spin until it's unlocked.

1. Pull the throttle down to the lowest position, wait for the red light on the flight controller to stop blinking and the blue light to stay solid, indicating the aircraft is calibrated and ready.

2. Move the left switch on the E8 Transmitter(ELRS-2.4G) upwards to the third position to unlock.

3. Once successfully unlocked, you'll see the propellers start spinning.

Note: In case of a collision, stop flying immediately to prevent damage. Before handling the Tinyhawk III Plus, make sure to switch the control sticks to the locked position.



6.2 Flight Modes

The Tinyhawk III Plus comes with its default setting in Simple Mode. The AUX 2 switch is configured to change between these modes using a 3-position switch. When AUX 2 is in the first position, the Tinyhawk III Plus will be in Simple Mode. When the switch is in the middle position, it will be in Intermediate Mode, and finally, the third position is Advanced Mode.

1. Simple Mode (Stabilized Mode ARM): This is a basic flight control mode where the maximum angle of the Tinyhawk III Plus is limited during flight to help restrict speed and make flying easier. In this mode, the aircraft's control is attitude-based. Pitch and roll inputs from the transmitter control the pitch and roll angles of the aircraft. For instance, a 20-degree roll input on the stick translates to a 20-degree roll angle for the Tinyhawk III Plus.
2. Intermediate Mode (Horizon Mode): This mode has a higher angle limit for faster flight. Attitude control remains the same. The only difference is that at the endpoints of pitch and roll stick inputs, the aircraft will flip in that direction.
3. Advanced Mode (Acro Mode): This mode gives you full control over the aircraft. There are no angle limits anymore, and control is rate-based. This means that control inputs from the sticks set a rotation rate around the respective axis.

Straight Flight

To learn how to pilot the Tinyhawk III Plus, start by flying it within line of sight (without wearing video goggles). Power on the Tinyhawk III Plus and place it in a safe and open area. Start the Tinyhawk III Plus and use the left stick to raise the throttle to hover. Begin by attempting to maintain a stable altitude. Control the throttle pitch with your thumbs to control the elevation of the aircraft, allowing the Tinyhawk III Plus to fly smoothly. It takes practice to become proficient, so repetition is necessary to achieve mastery.

Advanced Flying - First-Person View (FPV) Flight

Once you have a certain level of operational proficiency in flying, you can try flying using video goggles (FPV goggles). Make sure that the Tinyhawk III Plus and the video goggles are on the same VTX channel. Choose a spacious and safe location. Apply the experience gained from regular flight of the Tinyhawk III Plus to your operation. Use controlled throttle to maintain a slow and level flight, making it easier to learn FPV flying. As you gain more flying experience, you will be able to maneuver the Tinyhawk III Plus in the air like driving a car.

The video goggles display information (OSD) from the Tinyhawk III Plus camera's image feed. The OSD shows essential details such as flight time and battery voltage. Always keep an eye on these numbers during flight to gauge the remaining battery voltage. The Tinyhawk III Plus can fly for a maximum of 4 minutes. Land the Tinyhawk III Plus when the battery reaches 3.2V. It is not recommended to let the battery voltage drop below 3.2V, as this can damage the battery.

Warning: Maintain controlled altitude while flying, avoid making sudden stick movements, as it can make the aircraft difficult to control. Do not let the battery voltage drop below 3.2V. If you lose sight of the aircraft, activate the motors to produce a beeping sound to help locate the Tinyhawk III Plus Freestyle!



Warning:

Thank you for purchasing our product! Have a great time flying!

Warning: Please be aware of your surroundings. This product is not suitable for individuals under the age of 18. It contains small parts, so please keep it out of reach of children to avoid accidental swallowing.



MADE IN CHINA