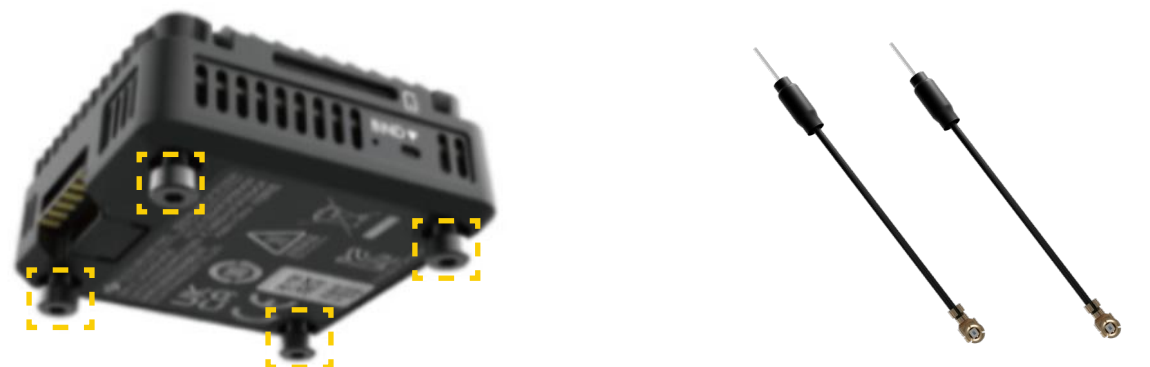


—、Mario Mini 25 Pro Installation Guide

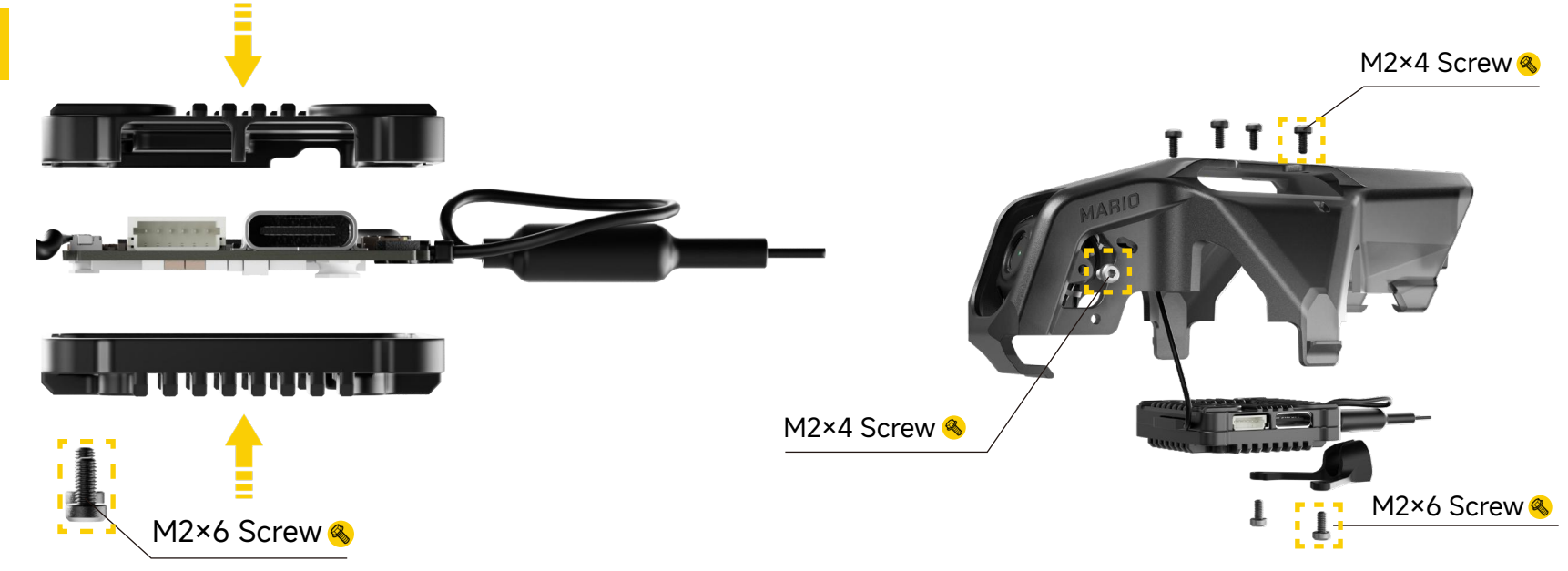
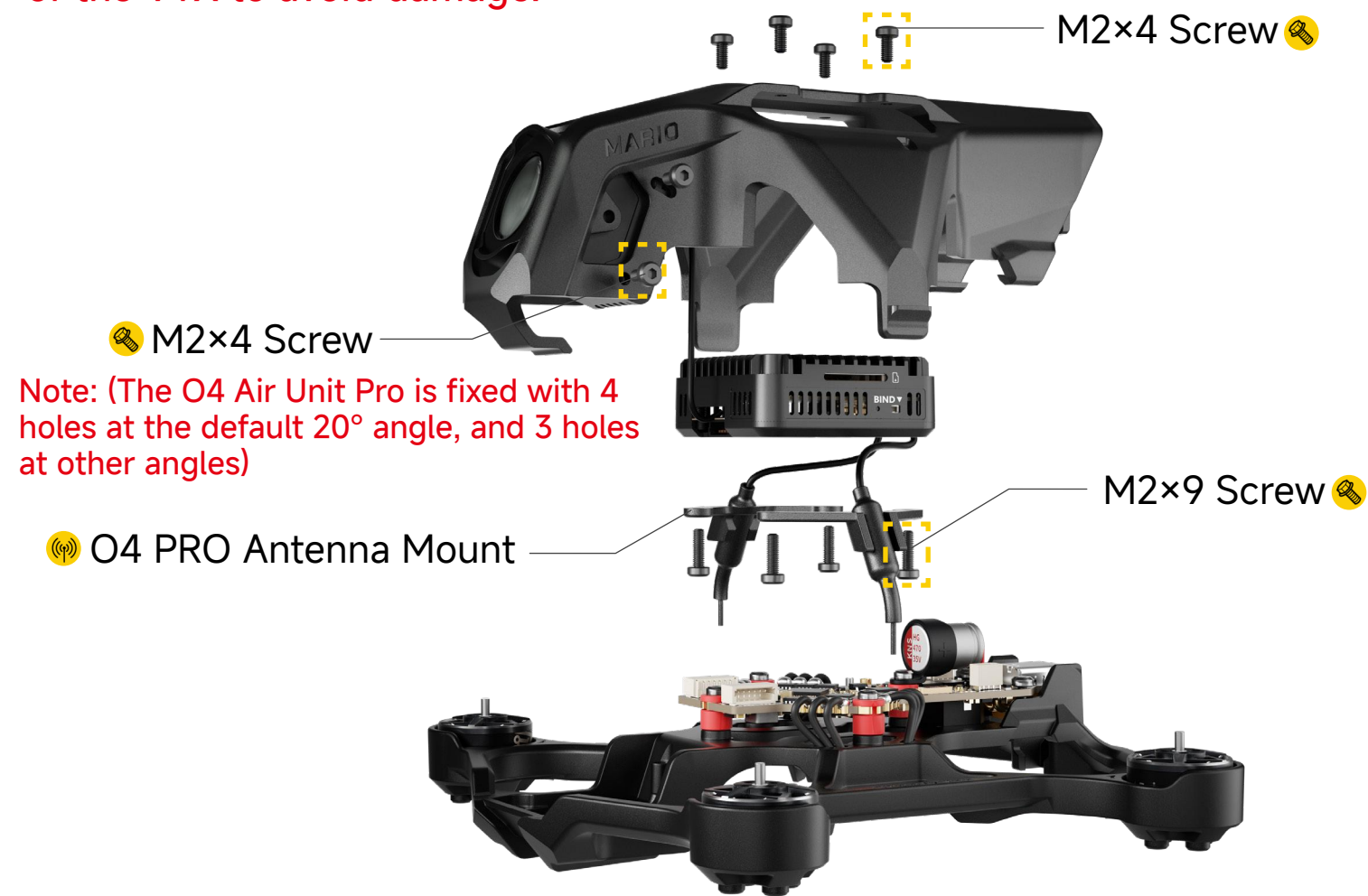
- 01 Mario Mini 25 Pro Installation Guide
- 02 Mode Overview
- 03 Binding Guide
- 04 Warnings



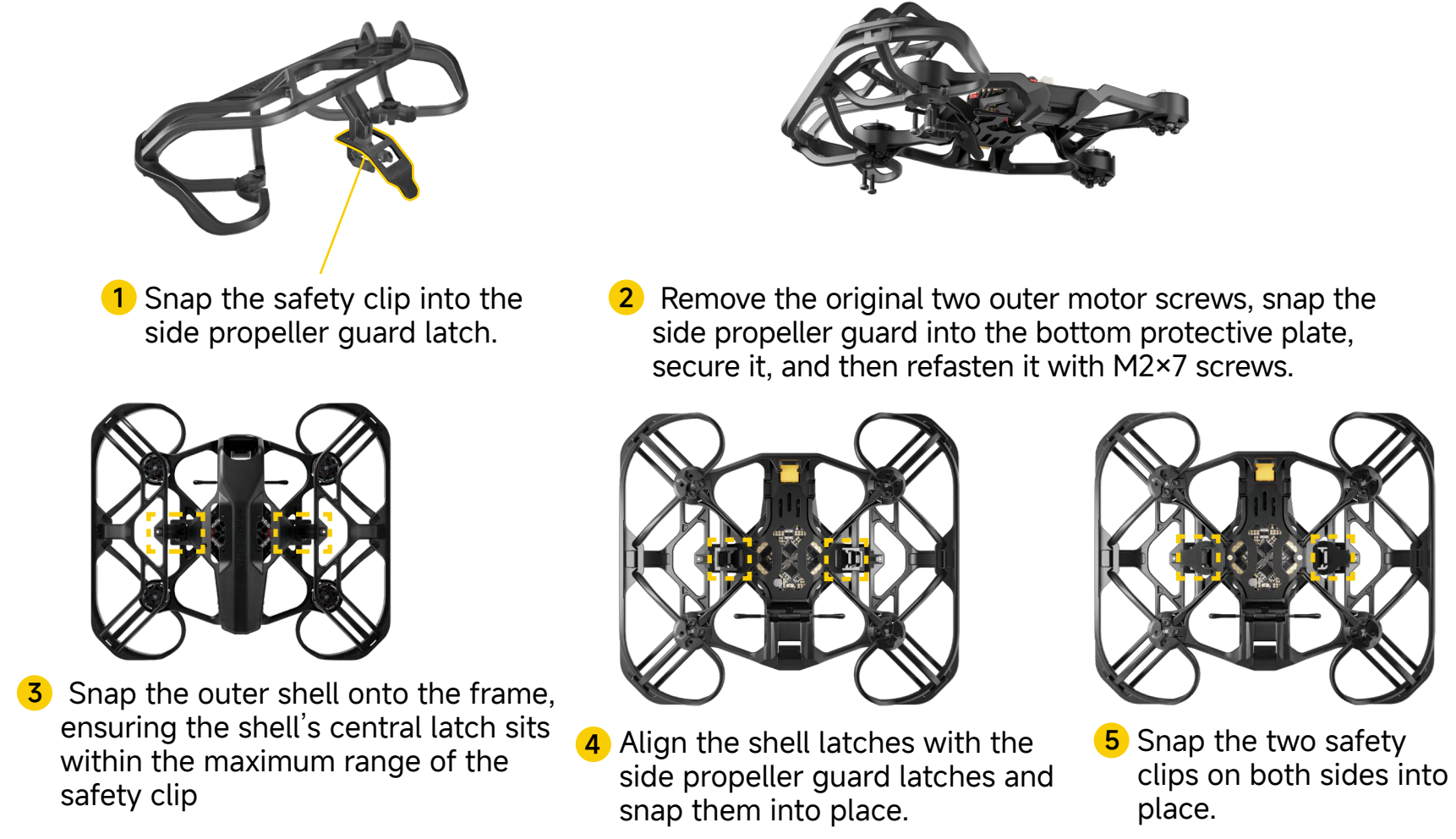
DJI O4 PRO VTX Installation



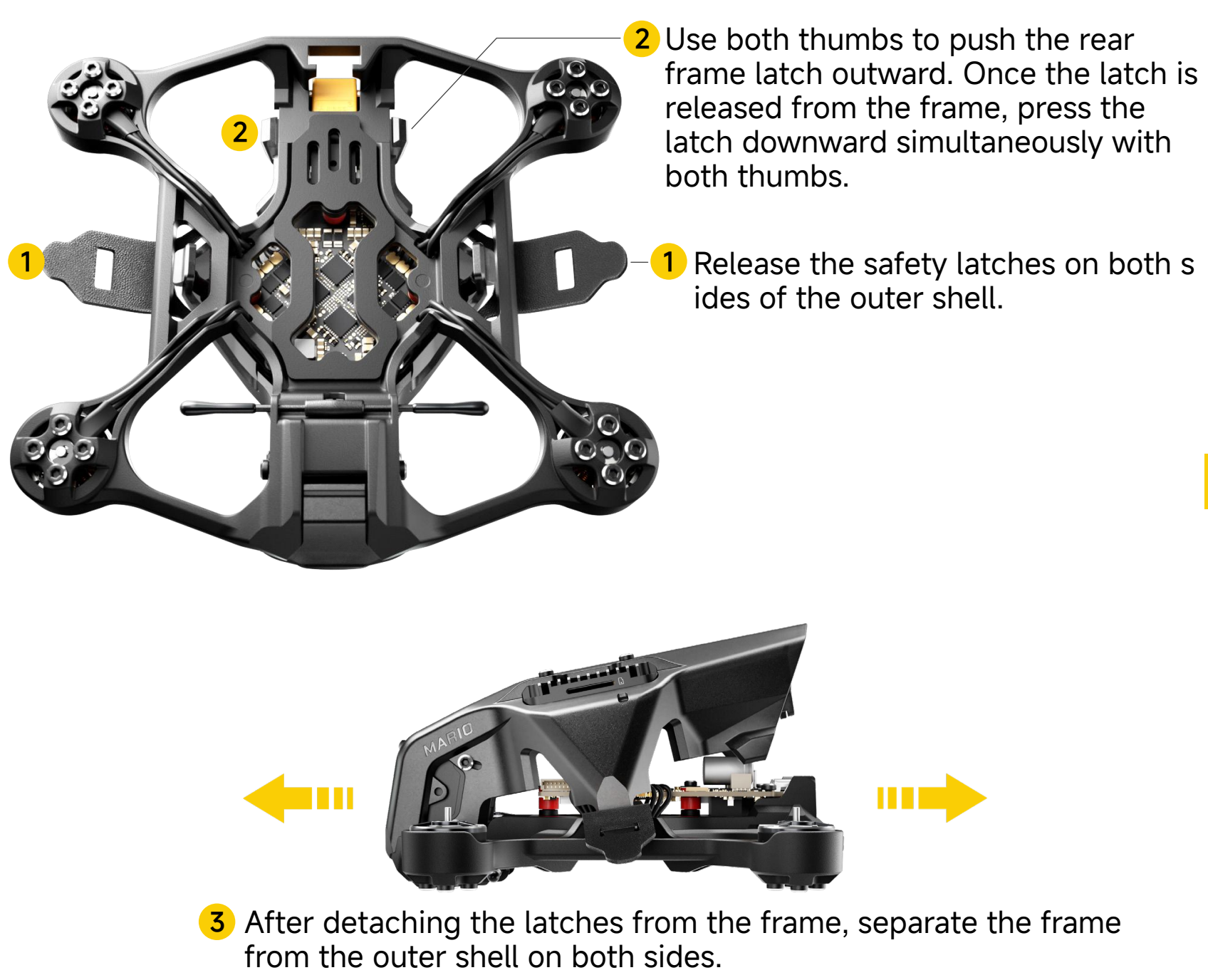
Unscrew the four screws at the bottom of the O4 PRO VTX and remove the two antennas. Replace them with the two pigtail antennas included in the package. After replacement, reassemble the O4 PRO.
Note: When opening the bottom case, pay attention to the internal ribbon cables of the VTX to avoid damage.



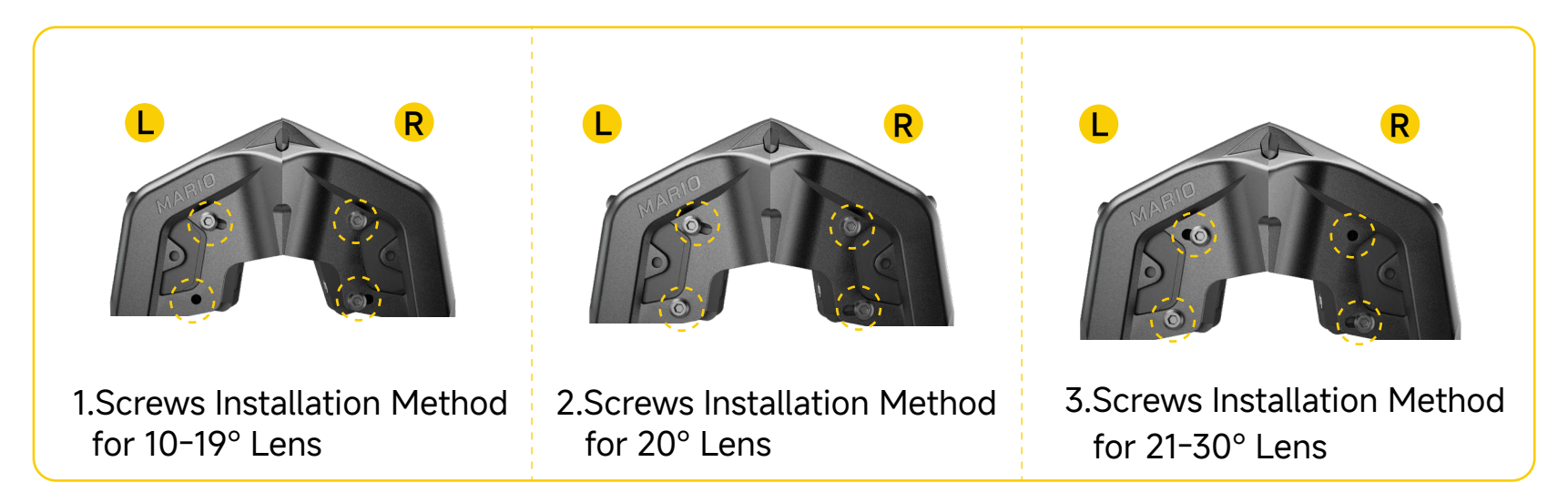
Propeller Guard Installation and Removal



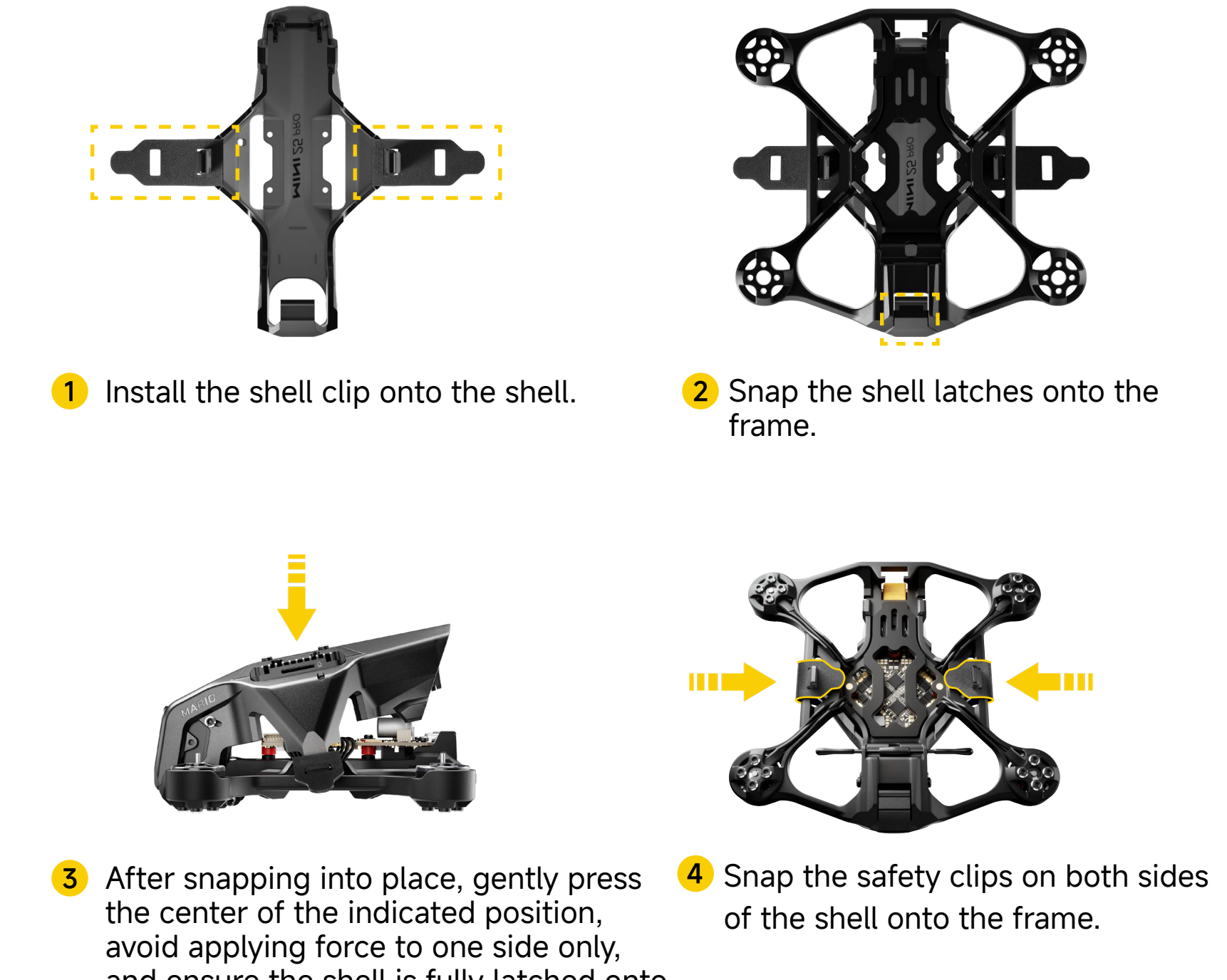
Disassembly of Mario Mini 25 Pro Shell



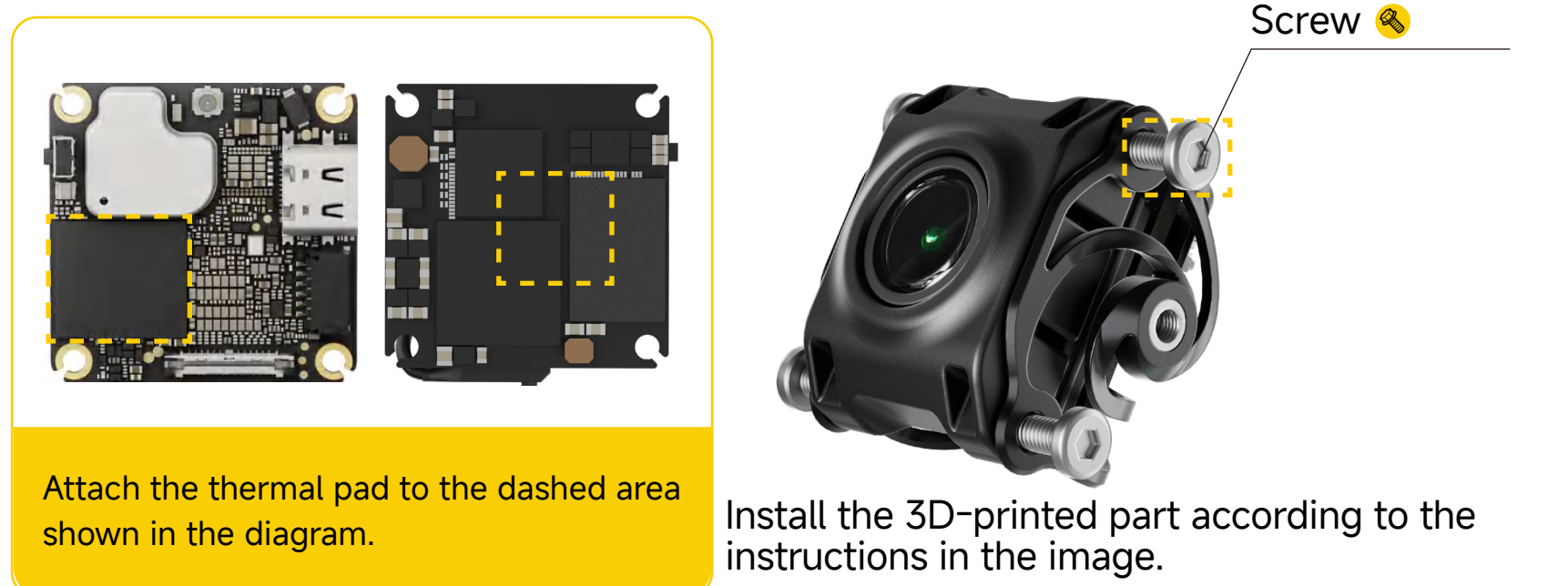
Lens Screws Installation Methods



Mario Mini 25 PRO Shell Installation



DJI O4 AIR UNIT VTX Installation



Attach the thermal pad to the dashed area shown in the diagram.
 Install the 3D-printed part according to the instructions in the image.
Note: Do not cut the 3D-printed part during installation, as this may cause video distortion.

Note: If the GPS or VTX is connected, slowly separate the lower protective plate from the upper shell to avoid pulling or damaging the wires.



- 1 As shown in the illustration, attach the included 3M adhesive to the dashed area indicated in the diagram.
- 2 Remove the top layer of the 3M adhesive, then attach it to the dashed area below.

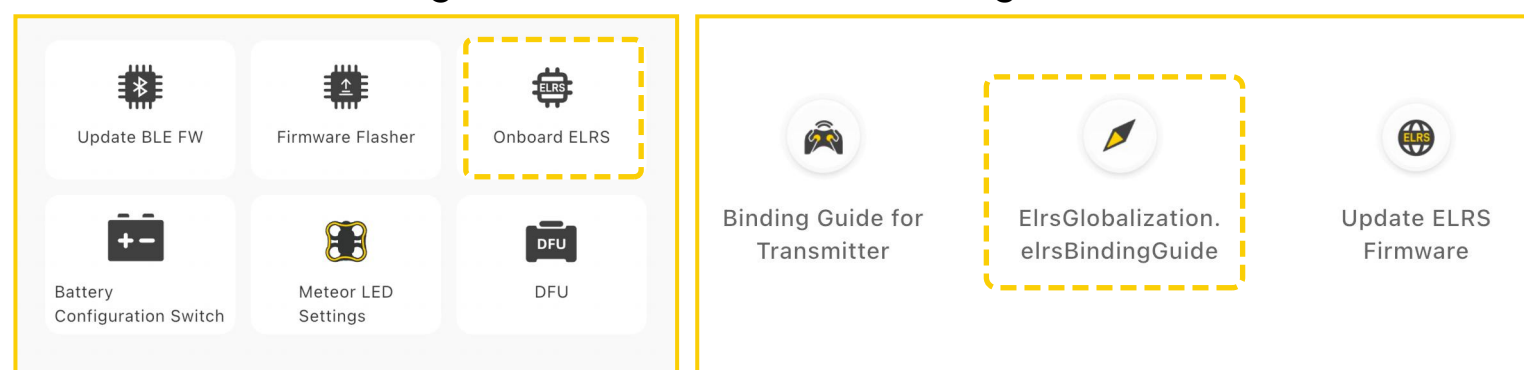
Note: Please refer to the flight controller manual for wiring instructions. The maximum GPS installation dimensions are 12mm × 16mm × 4.6mm.

三、 Binding Guide

After connecting the Mario 25 drone via the SpeedyBee APP, you can easily watch the binding guide video. Make sure your drone is properly bound to avoid interfering with others or encountering unnecessary flight issues.

Steps:

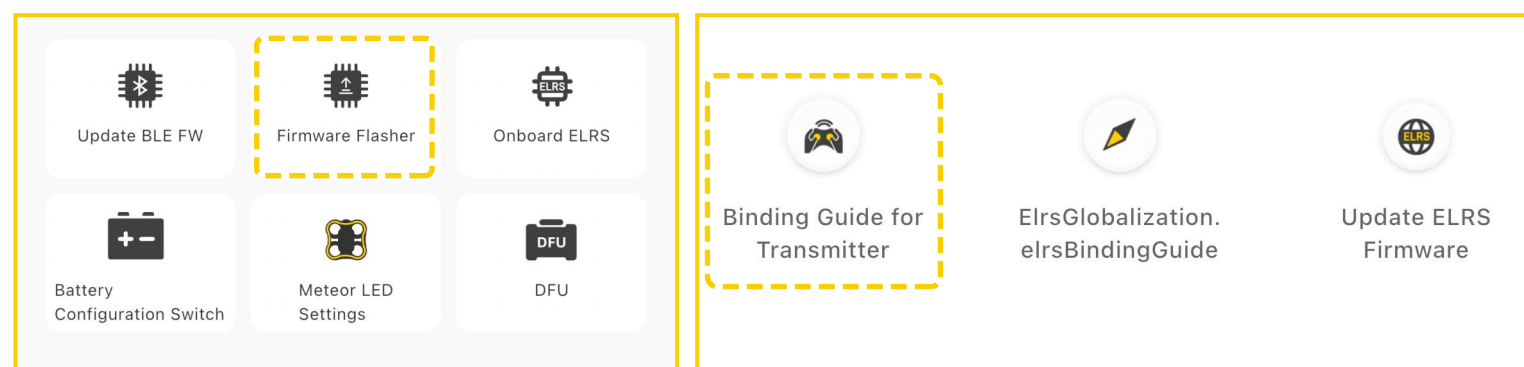
- 1 Connect to the Mario Mini 25 PRO drone using the SpeedyBee APP.
- 2 In the APP toolbox, select the onboard ELRS feature and choose the "Remote Controller Binding Guide" to watch the binding tutorial video.



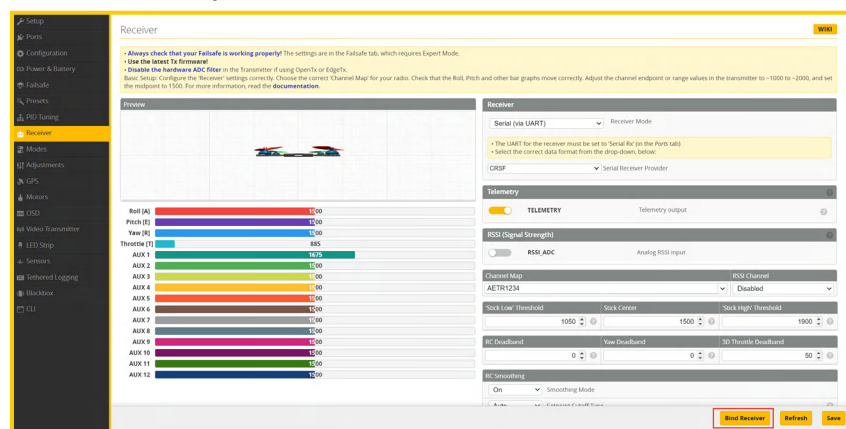
Note: Before binding, it is recommended to check whether the major firmware versions of the RF module and the receiver match. If they do not match, please use the SpeedyBee APP to update the firmware.

Receiver Pairing Mode Activation Methods

Method 1: Connect the Mario Mini 25 drone using the SpeedyBee APP on your \ mobile device. In the toolbox, select the onboard ELRS feature and click "Starting Binding" to put the receiver into the double-flash binding mode.



Method 2: Connect the Mario Mini 25 drone to the PC via the Betaflight Configurator. Go to the Receiver page and click the "Receiver Binding" button in the lower right corner to put the receiver into the double-flash binding mode.



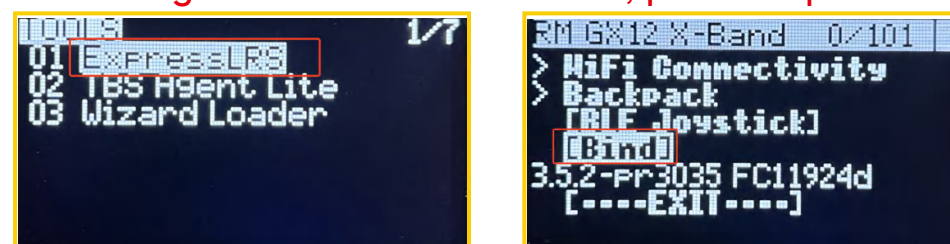
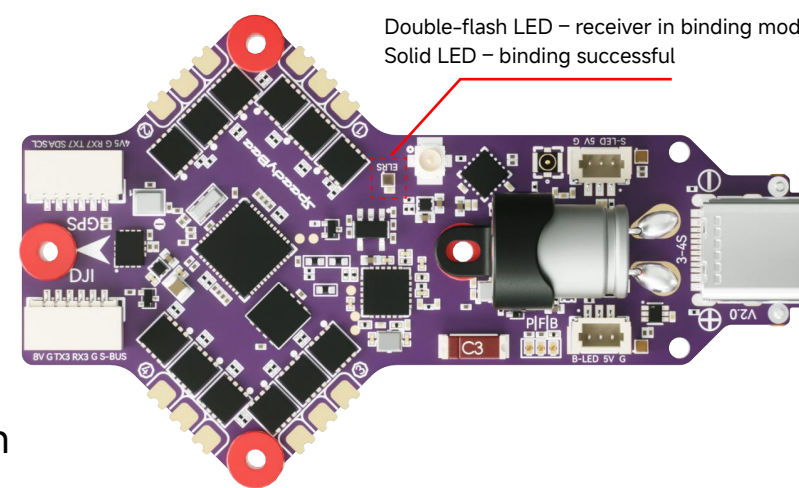
Method 3: Power the flight controller with a 3S battery three consecutive times to put the receiver into the double-flash binding mode.

Note: Each time you power on, wait for the receiver LED to light up before powering off and restarting. This ensures the flight controller's built-in ELRS receiver enters the correct binding state.

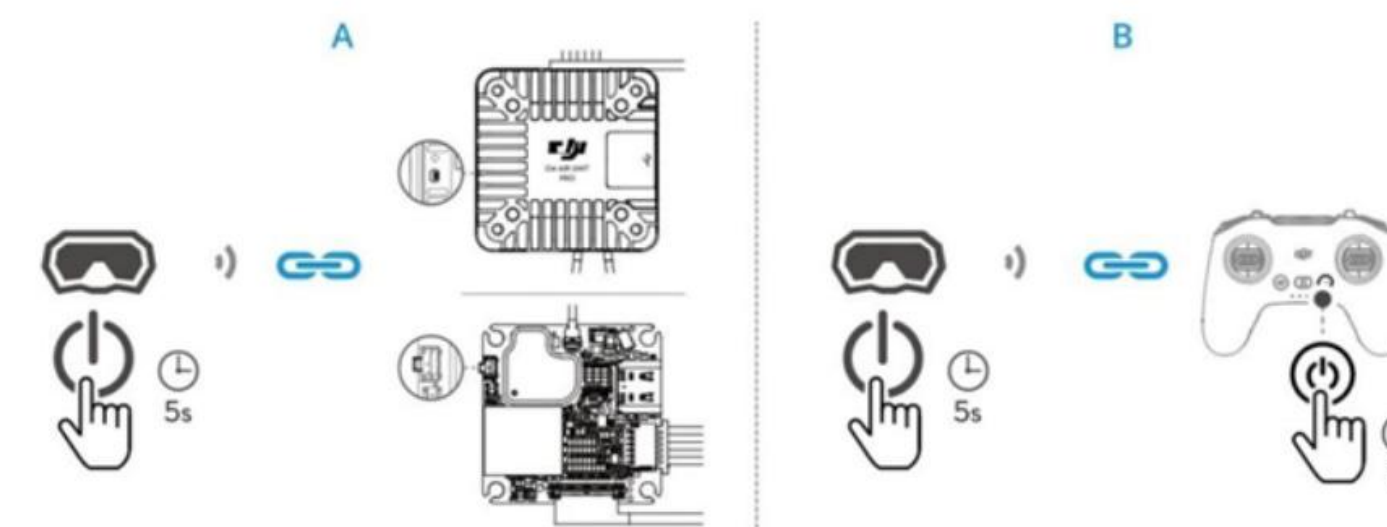
Remote Controller Binding Mode Activation Methods

1. Turn on the remote controller.
2. Tap or long-press the SYS button to enter the TOOLS menu.
3. Select ExpressLRS and enter.
4. Scroll down, find, and tap BIND.
5. The remote controller enters binding mode. The receiver LED will change from double-flash to solid, indicating successful binding.

Note: If the receiver LED changes from double-flash to single-flash, wait patiently for about 15 seconds until it turns solid. If the LED is still single-flash after 15 seconds, please repeat the steps above.



The following example uses the DJI Goggles 3 and DJI FPV Remote Controller 3 to illustrate the binding procedure.



Binding Between Goggles and Air Unit (Figure A)

1. Power on the Air Unit, then turn on the goggles and remote controller. Open the goggles menu, go to Status, and tap the top-right corner to switch to the Air Unit that needs binding.
2. Ensure the Air Unit's binding status LED is solid red. Press the binding button — the LED will start flashing red, indicating it has entered binding mode. Activate the binding mode on the goggles; the goggles will emit a "beep-beep" sound.
3. Once binding is successful, the Air Unit's binding status LED will turn solid green. The goggles will stop beeping and display the video feed.

Binding Between Goggles and Remote Controller (Figure B)

1. Activate the binding mode on both the goggles and the remote controller. The goggles will emit a "beep-beep" sound. The remote controller will also beep and its battery LED will flash in a loop.
2. Once binding is successful, the goggles will stop beeping and display the video feed, and the remote controller will stop beeping.

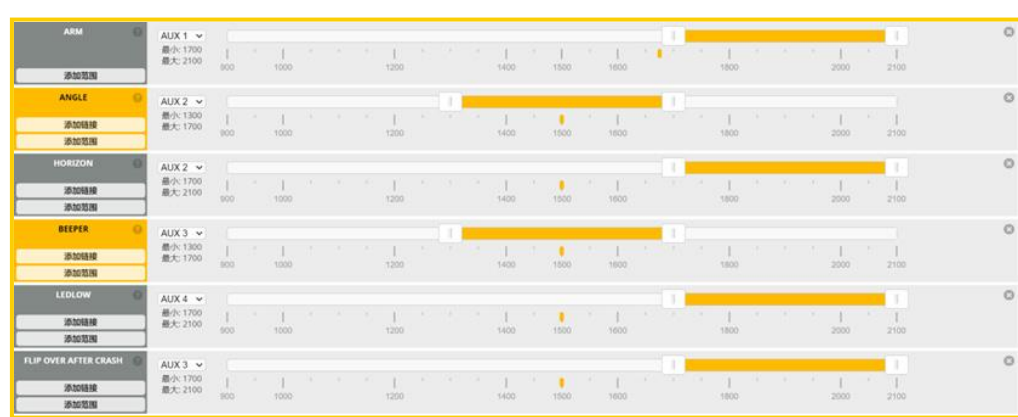
When binding the Air Unit with different models of goggles or remote controllers, the binding order may vary. Follow the binding steps specific to the goggles and remote controller being used.

四、 Warnings

Pre-Flight Safety Guidelines:

1. Always remove the propellers when powering the drone with the propulsion battery for tuning to avoid risks from accidental operation.
2. Inspect the FPV drone for any visible damage. If any damage is found, check or repair it before flight.
3. Ensure the propellers are installed in the correct orientation and the screws are properly tightened.
4. Make sure all screws on the drone are securely installed.
5. Check that the battery is firmly secured with straps and that the battery balance leads are properly organized or fixed to prevent them from being hit by the propellers.
6. Verify the battery voltage is sufficient. The Mario Mini 25 uses a 3S battery, with a full charge voltage of 12.6V.
7. Turn on the FPV goggles and ensure a good signal.
8. After powering the drone, maintain a safe distance of at least 3 meters during unlocking tests and check that the propellers spin normally.
9. Fly only in a safe, open area where no one is nearby.

二、 Mode Overview



1. Arm Mode (ARM)

When activated, the drone enters the armed state. The motors start and idle, preparing the drone for takeoff or other operations.

2. Stabilized Mode (ANGLE)

When activated, the drone limits its flight angles and automatically levels itself when the sticks are released. This mode is suitable for beginners or scenarios requiring stable flight.

3. Semi-Stabilized Mode (HORIZON)

When activated, the drone maintains self-leveling while dynamically adjusting control sensitivity based on stick input. Larger stick deflections make the flight behavior closer to manual mode. This mode is suitable for advanced flight training.

4. Manual Mode (ACRO)

When both Stabilized (ANGLE) and Semi-Stabilized (HORIZON) modes are not enabled, the drone automatically switches to Manual mode. In this mode, flight angles are unrestricted, and the drone does not auto-level when sticks are released. It is intended for acrobatic flying and advanced control.

5. Buzzer Mode (BEEPER)

When activated, the drone emits a beeping sound to help quickly locate it in complex environments.

6. LED Off Mode (LEDLOW)

When activated, the drone's LEDs are turned off, suitable for low-light shooting or energy-saving flights.

7. Flip-Over Mode (FLIP OVER AFTER CRASH)

If the drone flips over or lands upside down due to a collision or accident, follow the steps below in this mode to right the drone.

Step 1: Activate Flip-Over Mode (FLIP OVER AFTER CRASH).

Step 2: Then activate Arm Mode (ARM).

Step 3: Use the aileron or pitch sticks to reverse thrust the motors and flip the drone back to normal orientation.

Note: Improper use of this mode may damage the drone. Use with caution.

Mario Mini 25 Flight Controller User Manual

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- Package Contents1.2
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- Flight Controller Status LED..... 1.3.2
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Part-2- Flight Controller Connections and Setup Overview

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- GPS Parameter Setup Procedure.....2.1.1
- DJI O4 AIR UNIT Parameter Setup Procedure2.1.2
- TBS Receiver Parameter Setup and Wiring Procedure2.1.3
- Bluetooth Feature Activation Tutorial2.1.4

Part-3-Wireless Connection Tutorial

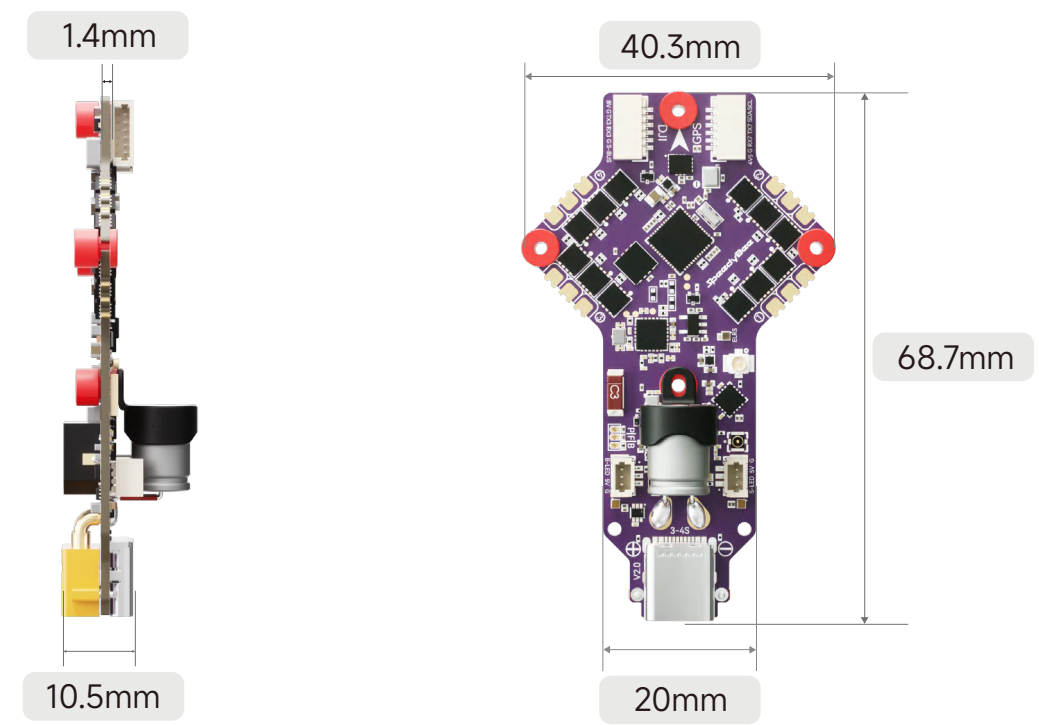
- Onboard ELRS Feature3.1
- Battery Configuration Switching 3.1.2
- Meteor LED Strip Setup 3.1.3

Part-4- Flight Controller Parameter Table

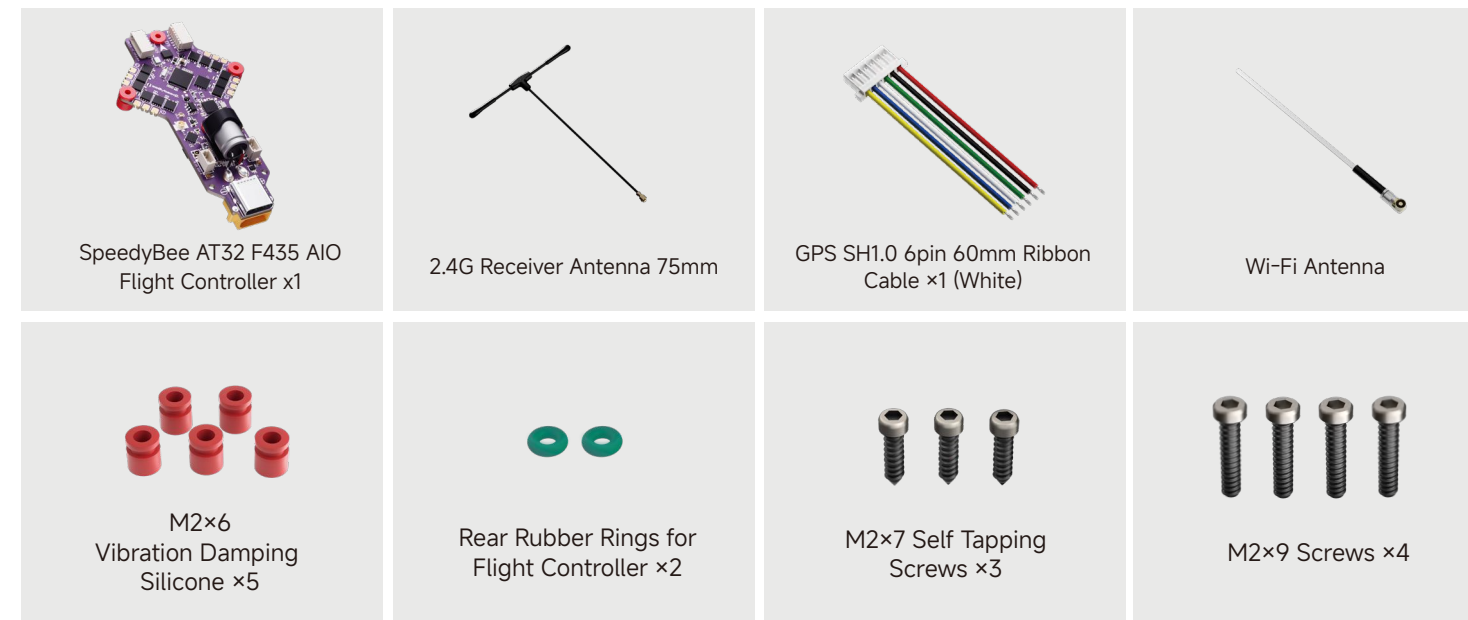
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01Overview

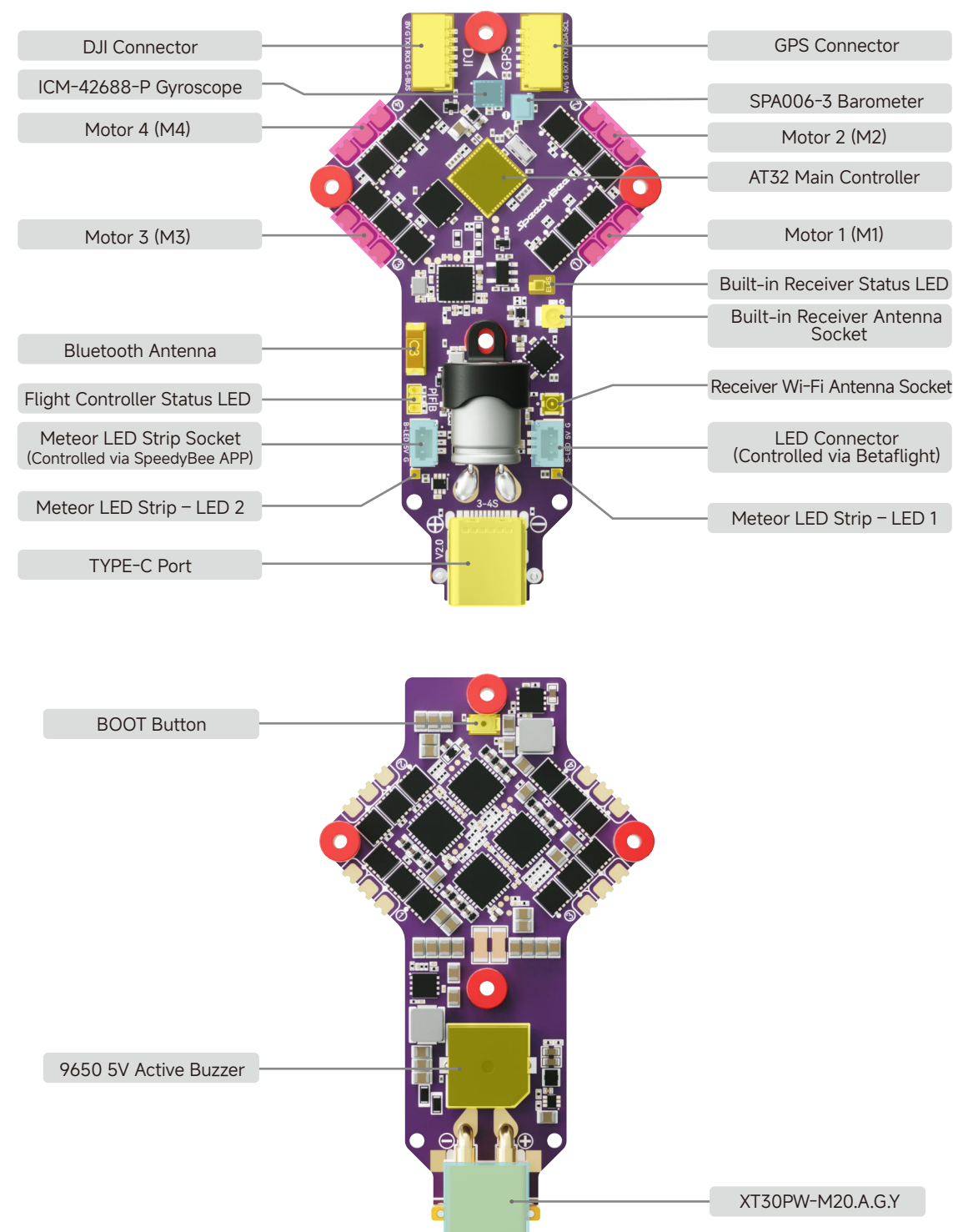
1.1 Dimension Diagram



1.2 Package Contents



1.3 Flight Controller Exterior Labels



1.3.1 Receiver Status LED

- 1 Steady On: Binding successful.
- 2 Double Flashing: Entering binding mode (can be activated by power cycling three times).

Note: Please wait until the receiver LED lights up before powering off; otherwise, the receiver will not enter binding mode.

1.3.2 Flight Controller Status LEDs

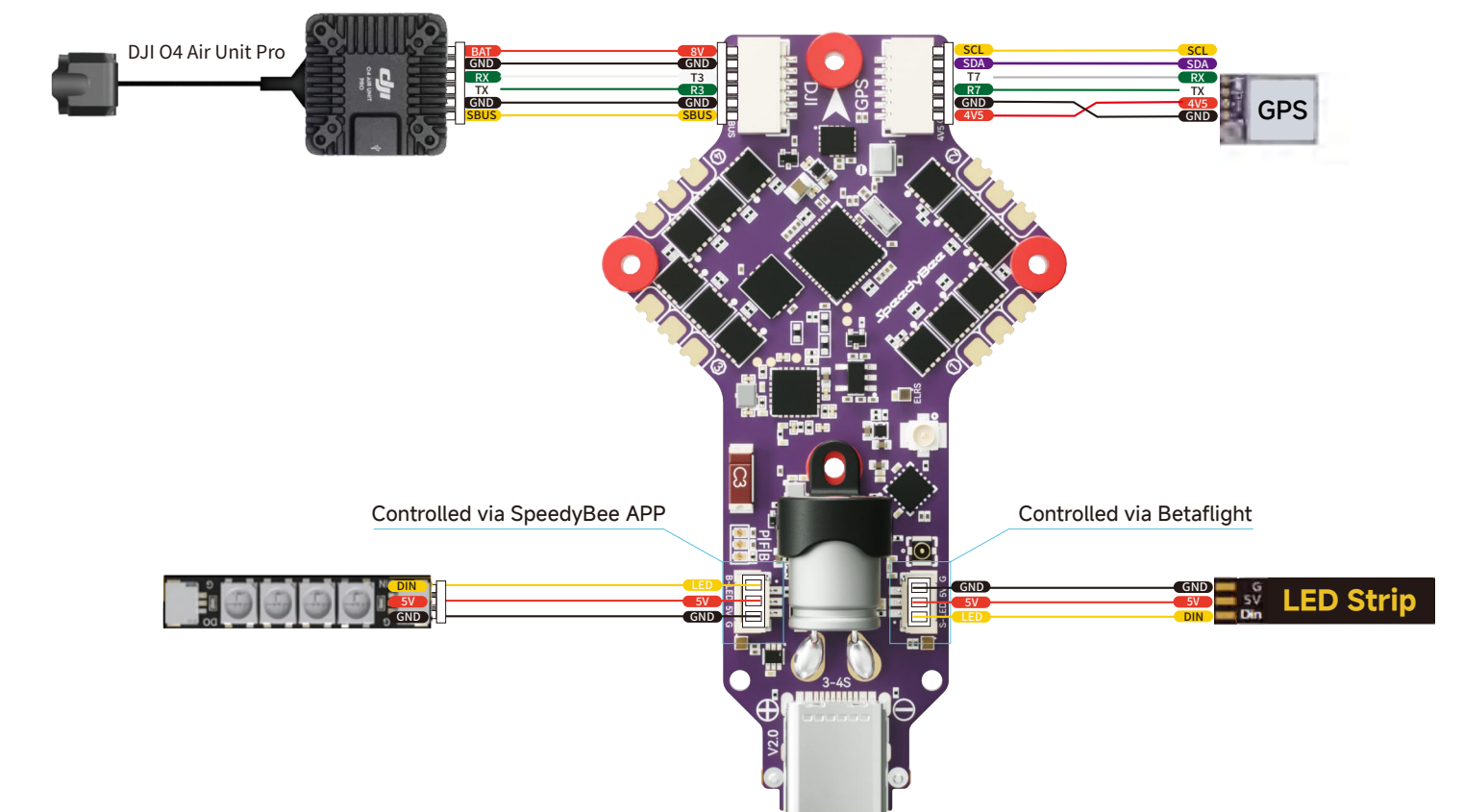
- 1 **P (Red LED) -Power Indicator.**
Normal: The red power LED is steady on after powering up, indicating the 3.3V power system is operating normally.
- 2 **F (Blue LED) - Flight Controller Status LED (controlled by flight controller firmware).**
Unlockable: Blue LED off.
Not Unlockable: Blue LED slow flashing.
- 3 **B (Green LED) -Bluetooth Indicator.**
Steady Green: Bluetooth connected.
Flashing Green: Bluetooth not connected.

1.3.3 BOOT Button

The BOOT button is a shared function button for the Flight Controller and Receiver. Pressing it while powering the device will put the corresponding device into DFU mode.

02 Flight Controller Connections and Setup Overview

2.1 Flight Controller Connections and Setup Overview

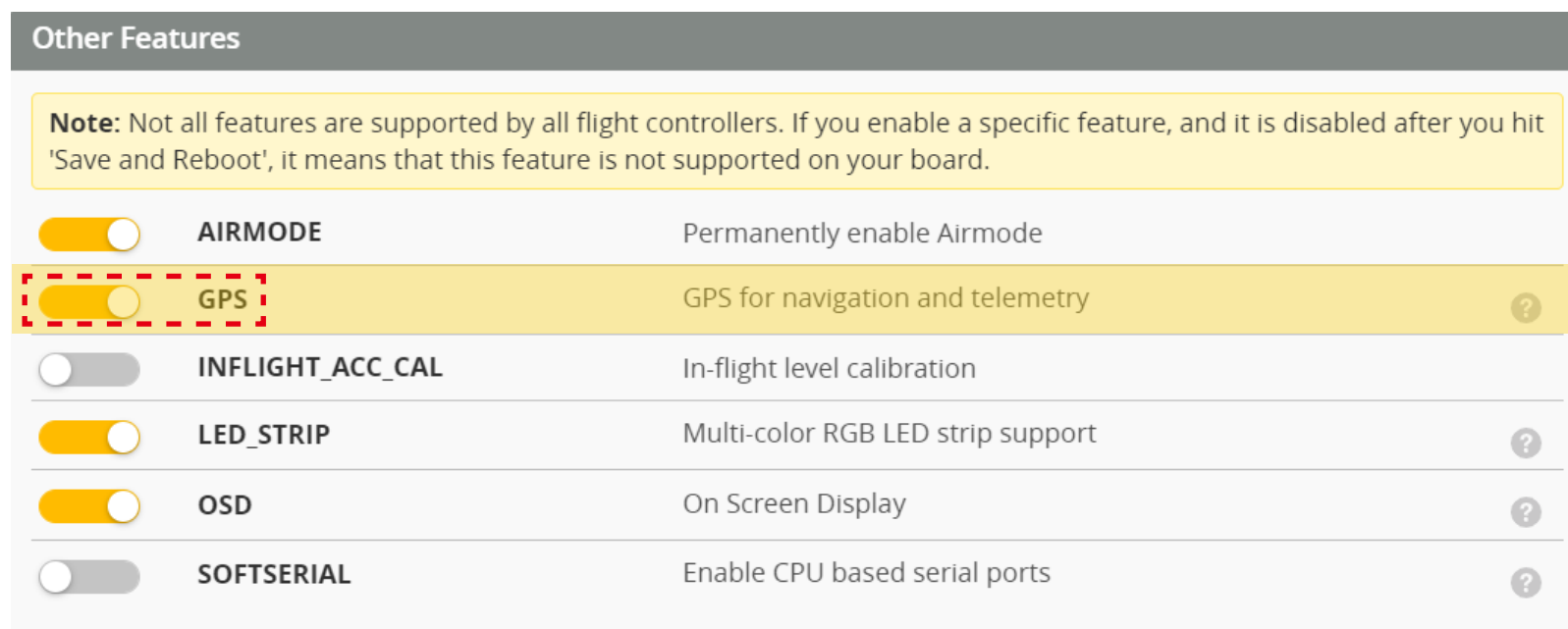


2.1.1 GPS Parameter Setup Procedure

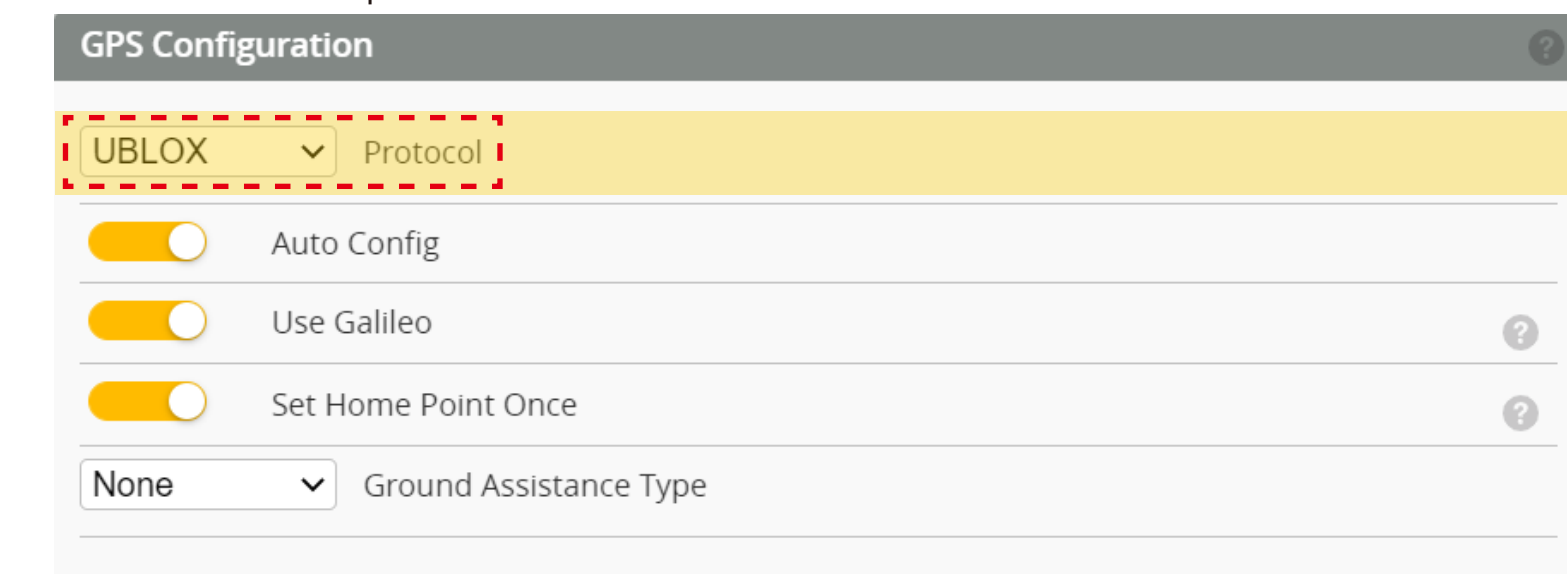
1. On the Ports page, set the sensor input of UART7 to GPS and set the baud rate to Auto.

| Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
|------------|--|-------------------------------------|------------------|---|---------------|
| USB VCP | <input checked="" type="checkbox"/> 115200 | <input type="checkbox"/> | Disabled | Disabled | Disabled |
| UART1 | <input checked="" type="checkbox"/> 115200 | <input type="checkbox"/> | Disabled | Disabled | Disabled |
| UART2 | <input type="checkbox"/> 115200 | <input type="checkbox"/> | Disabled | Disabled | Disabled |
| UART3 | <input checked="" type="checkbox"/> 115200 | <input type="checkbox"/> | Disabled | Disabled | VTX (MSP + D) |
| UART5 | <input type="checkbox"/> 115200 | <input checked="" type="checkbox"/> | Disabled | Disabled | Disabled |
| UART7 | <input type="checkbox"/> 115200 | <input type="checkbox"/> | Disabled | <input checked="" type="checkbox"/> GPS | Disabled |

2. On the Configuration page, enable the GPS feature.



3. On the GPS page, select the corresponding GPS protocol (common GPS protocol: UBLOX).



2.1.2 DJI O4 AIR UNIT Parameter Setup Procedure

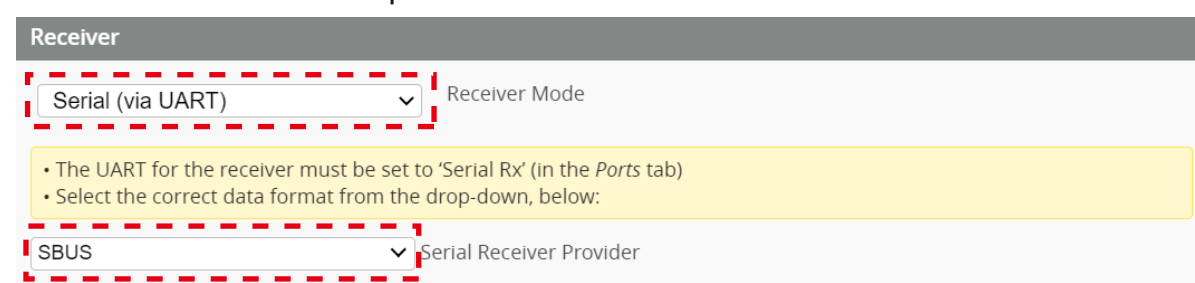
1. On the Ports page, enable MSP on UART3 and change the peripheral to VTX (MSP + DisplayPort).

| Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
|------------|-------------------|-----------|------------------|-----------------|----------------------|
| USB VCP | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART1 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART2 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART3 | 115200 | On | Disabled / AUTO | Disabled / AUTO | VTX (MSP + D) / AUTO |
| UART5 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART7 | 115200 | Off | Disabled / AUTO | GPS / 57600 | Disabled / AUTO |

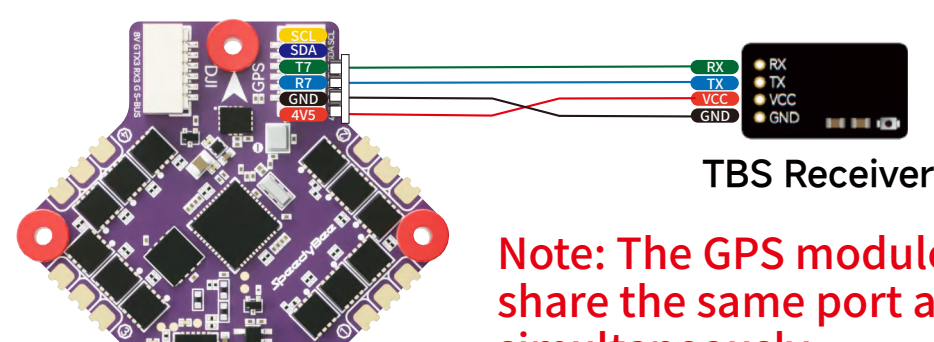
2. If you are using a DJI FPV Remote Controller, disable the serial receiver on UART5, then enable the serial receiver on UART2.

| Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
|------------|-------------------|-----------|------------------|-----------------|----------------------|
| USB VCP | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART1 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART2 | 115200 | On | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART3 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | VTX (MSP + D) / AUTO |
| UART5 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART7 | 115200 | Off | Disabled / AUTO | GPS / 57600 | Disabled / AUTO |

Open the Receiver page, change the receiver mode to Serial Receiver (via UART), and set the receiver protocol to SBUS.



2.1.2 TBS Receiver Parameter Setup and Wiring Procedure



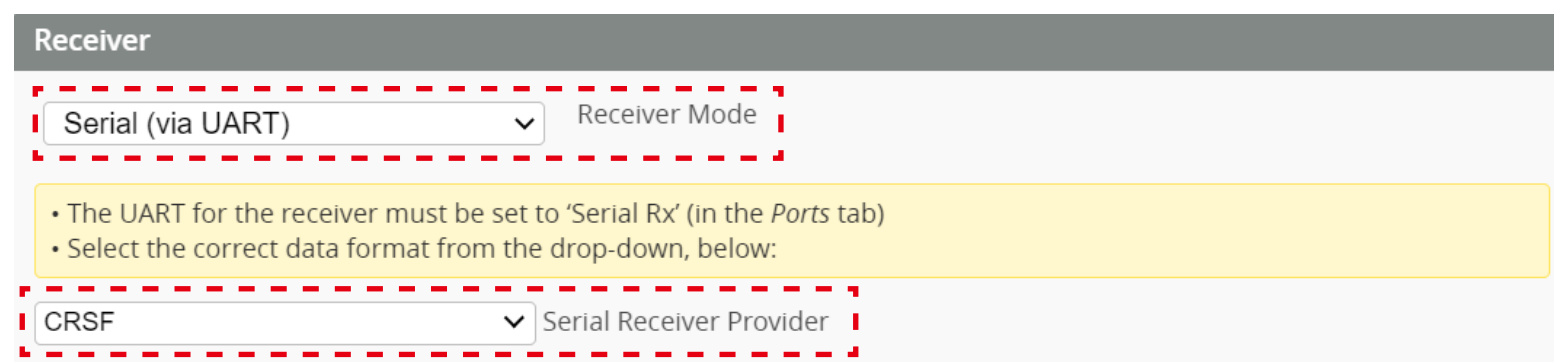
Note: The GPS module and the TBS Receiver share the same port and cannot be used simultaneously.

1. On the Ports page, disable the serial receiver on UART5 and the GPS on UART7, then enable the serial receiver on UART7.

| Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
|------------|-------------------|-----------|------------------|-----------------|----------------------|
| USB VCP | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART1 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART2 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART3 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | VTX (MSP + D) / AUTO |
| UART5 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART7 | 115200 | On | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |

Note: The GPS module and the TBS Receiver share the same port and cannot be used simultaneously.

2. On the Receiver page, change the receiver mode to Serial Receiver (via UART) and set the receiver protocol to CRSF.



2.1.4 Bluetooth Feature Activation Tutorial

1. On the Ports page, enable MSP on UART1.

| Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
|------------|-------------------|-----------|------------------|-----------------|----------------------|
| USB VCP | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART1 | 115200 | On | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART2 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART3 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | VTX (MSP + D) / AUTO |
| UART5 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |
| UART7 | 115200 | Off | Disabled / AUTO | Disabled / AUTO | Disabled / AUTO |

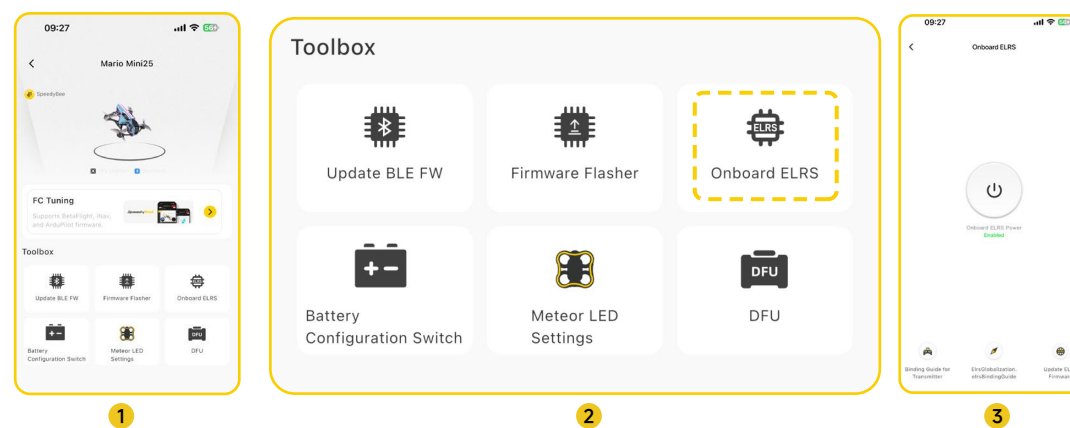
03 Wireless Connection Tutorial

3.1 Onboard ELRS Feature

SpeedyBee has integrated the ELRS 2.4 Receiver into the Flight Controller for the first time. It supports entering binding mode via the SpeedyBee APP and allows remote control of the receiver's power switch. This effectively avoids signal interference and extra power consumption when using the DJI FPV Remote Controller.

Steps:

1. Connect to the Mario Mini AIO Flight Controller using the SpeedyBee APP.



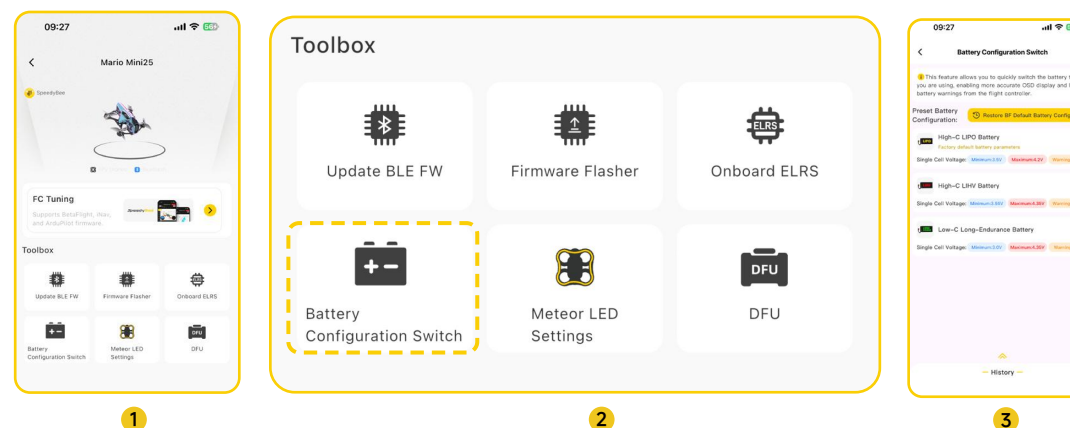
2. In the Toolbox, select the Onboard ELRS feature.

3.1.2 Battery Configuration Switching

The Mario Mini AIO Flight Controller features a one-click battery parameter switching function. It supports three configurations: high-rate LiPo, high-rate high-voltage LiPo, and low-rate long endurance batteries. No matter the scenario, you can quickly switch battery parameters in the field to meet different flight requirements.

Steps:

1. Connect to the Mario Mini AIO Flight Controller using the SpeedyBee APP.



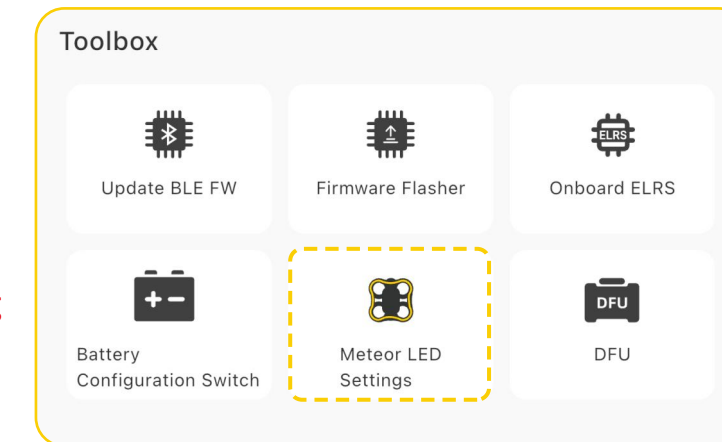
2. In the Toolbox, select the Onboard ELRS feature.

3.1.3 Meteor LED Strip Setup

The Mario Mini AIO Flight Controller features multiple meteor LED strip effects and includes different status indicators. Users can customize personalized lighting effects via the SpeedyBee APP. After powering the LED strip through the LED strip port, the strip will display the current battery level within 3 seconds using the following color indicators:

- Red: 1%-19%
- Orange: 20%-54%
- Yellow: 55%-84%
- Green: 85%-100%

Note: To display the battery level correctly, make sure the battery parameters in Section 3.1.2 are configured according to the battery you are using. This prevents incorrect status LED indications.



Steps:

1. Connect to the Mario Mini AIO Flight Controller using the SpeedyBee APP.

2. In the Toolbox, select the Meteor LED Strip Setup feature. Additionally, the Mario Mini AIO supports switching the meteor LED strip color status via the Remote Controller.

Operation:

- Power Control: Set the channel corresponding to the LEDLOW mode to high to turn off the LED strip, or low to turn it on.
- Effect Switching: Quickly toggle the channel corresponding to LEDLOW mode once to switch the meteor LED strip effect.

04 Flight Controller Parameter Table

4.1 Flight Controller Specifications Overview

| | | | |
|---|--|--------------------------------------|---|
| Product Name | SpeedyBee Mario Mini AIO | I2C | Supported |
| Main Controller | AT32 F435 | UART Ports | UART1 (Bluetooth) UART2 (SBUS) UART3 (DJI O4) UART5 (Onboard ELRS 2.4 Receiver) UART7 (GPS) |
| Gyroscope | ICM-42688-P | Meteor LED Strip Feature | Supported |
| USB Interface | TYPE-C | Buzzer | Built-in (9650 5V Active Buzzer) |
| Barometer | SPA06-003 | Supported Flight Controller Firmware | Betaflight (Default) |
| OSD Chip | None | Flight Controller Firmware Name | SPEEDYBEEAT32F435AIORX (AT32F435G) |
| Full-feature Bluetooth Tuning | Supported | Mounting Holes | 25.5 × 25.5 mm |
| Wireless Flight Controller Firmware Upgrade | Supported | Weight | 15g |
| Blackbox | Built-in 8M storage chip | | |
| 5V Outputs | Two 5V outputs, each for powering a set of LEDs. Total current load: 2A. | | |
| 8V Output | One 8V output, dedicated for VTX. Total current load: 2A. | | |
| 4.5V Output | One 4.5V output, dedicated for the Receiver and GPS module. This applies even when the FC is powered via the USB port. Maximum current load: 2A. | | |

4.2 ESC Specifications Overview

| | |
|-----------------------|--------------------------|
| Product Name | SpeedyBee Mario Mini AIO |
| Input Voltage | 3-4S Lipo (11.1V-16.8V) |
| Continuous Current | 25A × 4 |
| Maximum Burst Current | 4S 35A (10S) |
| ESC Protocol | DSHOT300/600 |
| Current Sensor | Scale 215; Offset-12390 |
| ESC Firmware | OX32; V1.14 |