

# Mario Mini 25 Flight Controller User Manual

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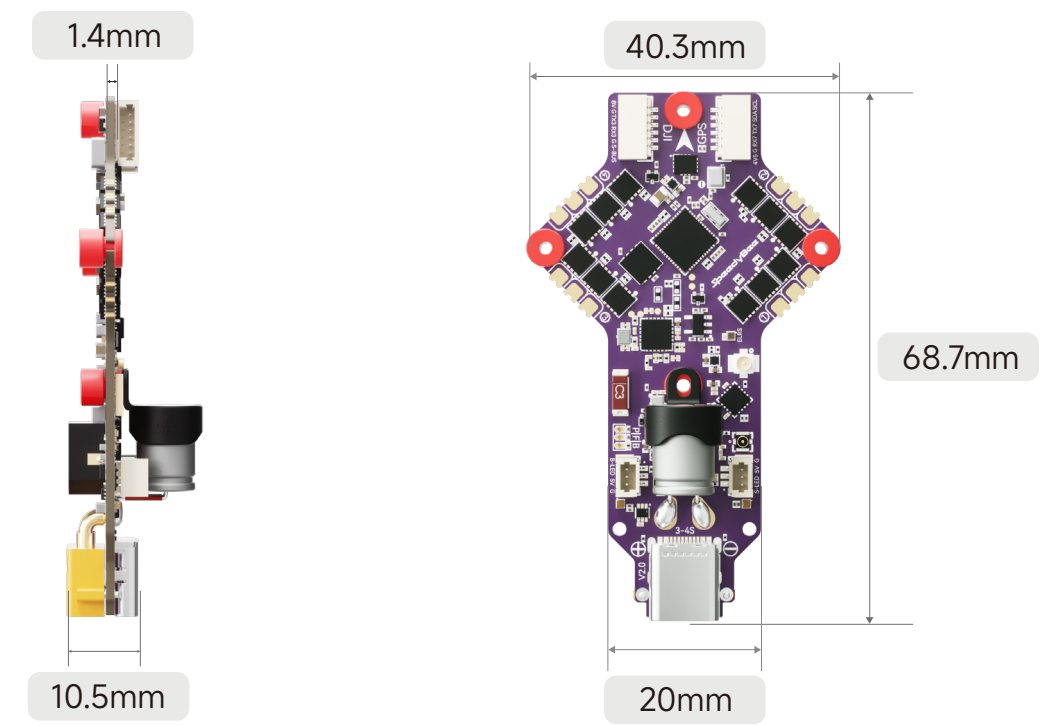
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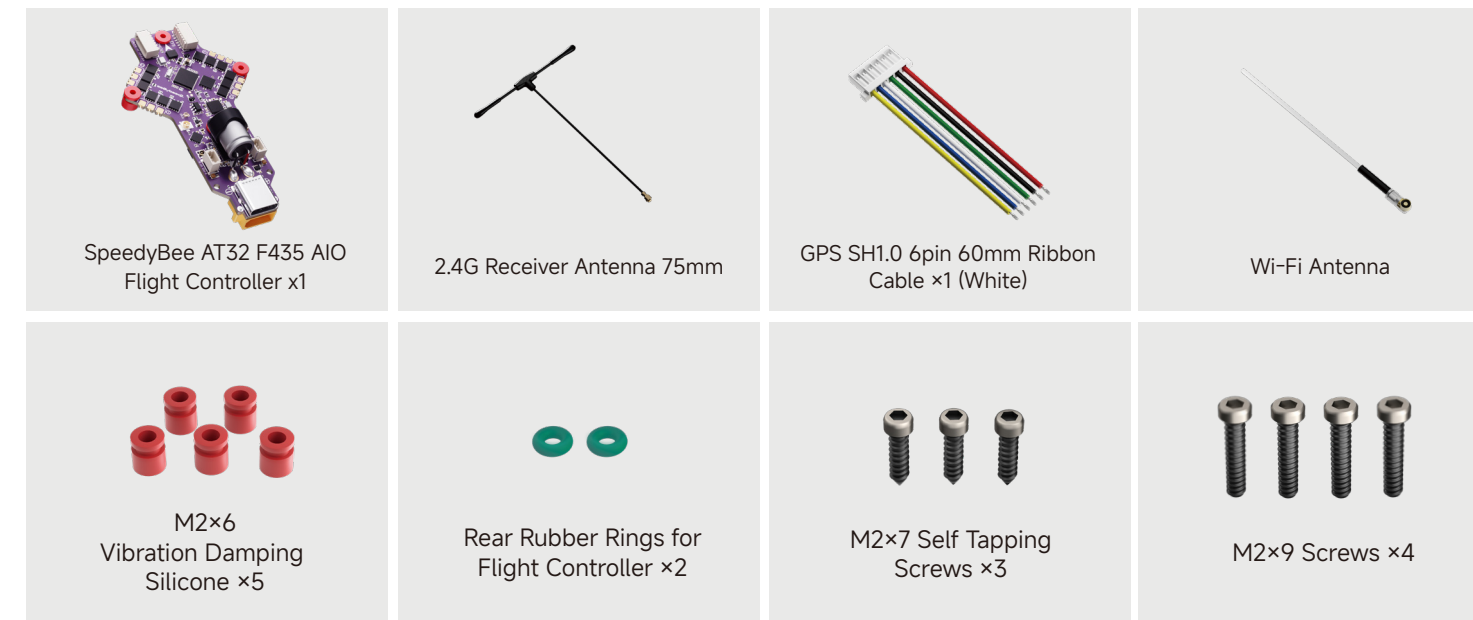
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# 01 Overview

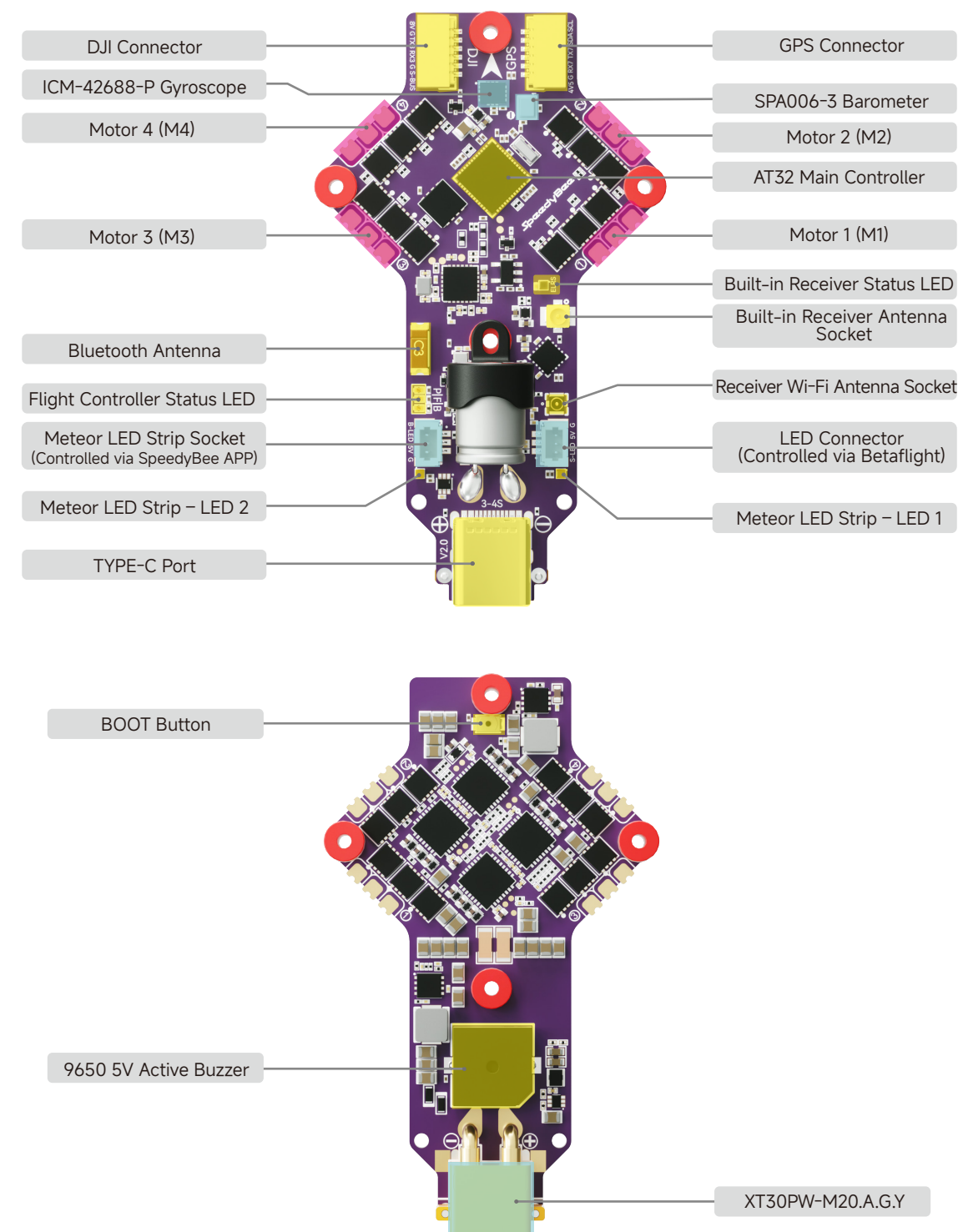
## 1.1 Dimension Diagram



## 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

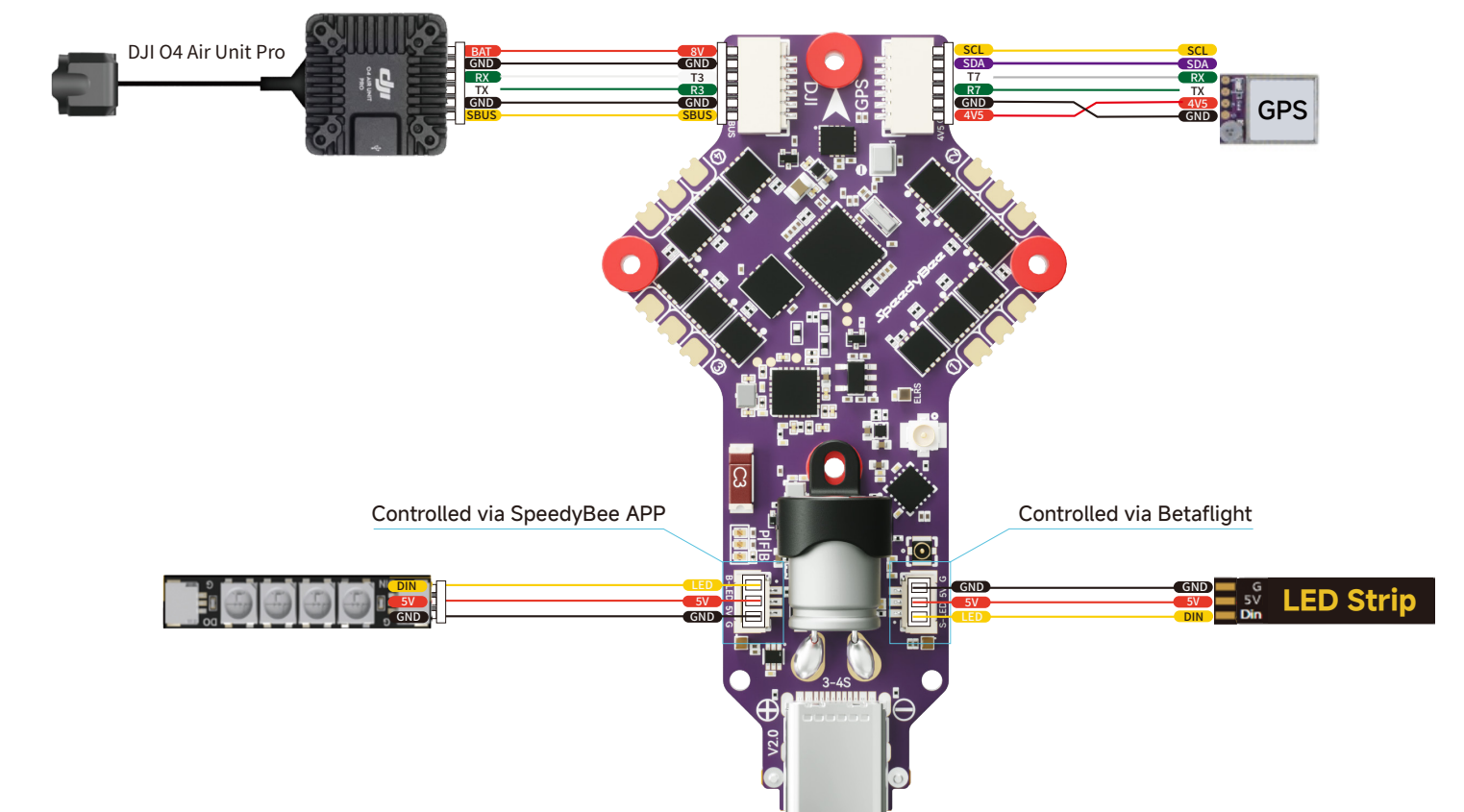
- 1 **P (Red LED) -Power Indicator.**  
Normal: The red power LED is steady on after powering up, indicating the 3.3V power system is operating normally.
- 2 **F (Blue LED) - Flight Controller Status LED (controlled by flight controller firmware).**  
Unlockable: Blue LED off.  
Not Unlockable: Blue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

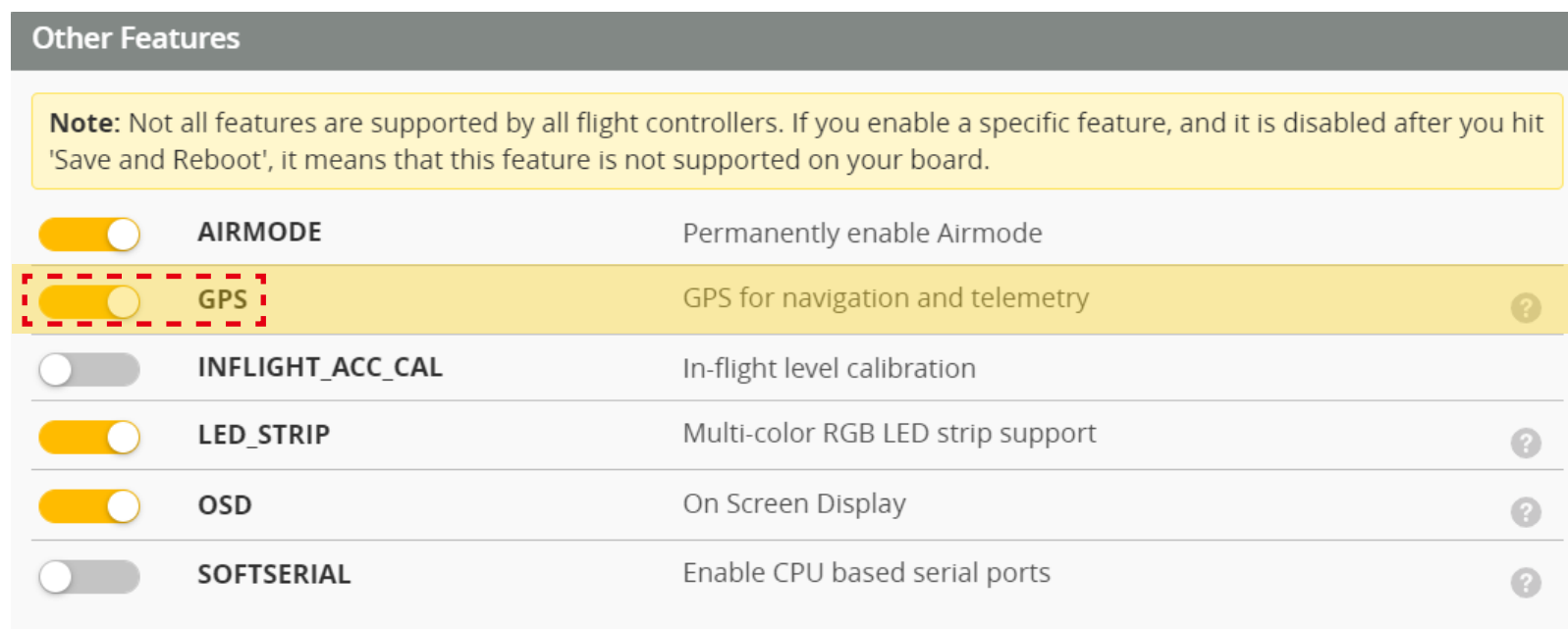


## 2.1.1 GPS Parameter Setup Procedure

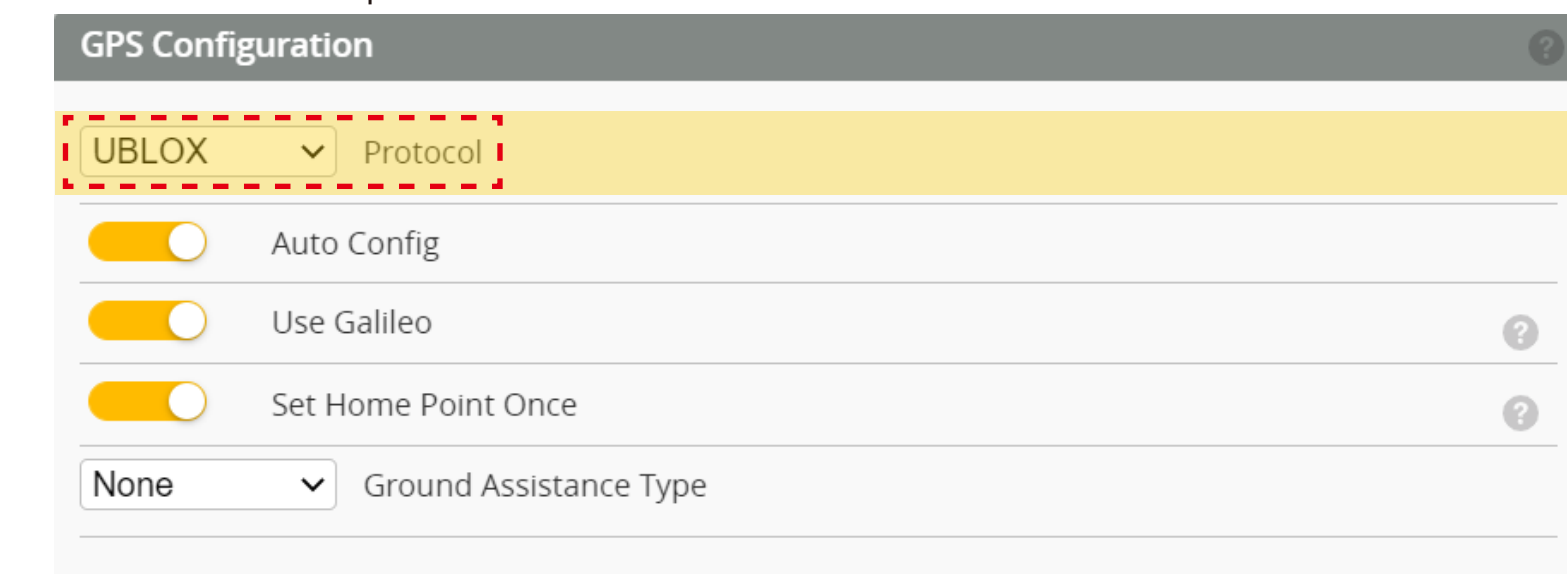
1. On the Ports page, set the sensor input of UART7 to GPS and set the baud rate to Auto.

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART1	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART2	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART3	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	VTX (MSP + D)   AUTO
UART5	<input type="checkbox"/> 115200	<input checked="" type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART7	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	<input checked="" type="checkbox"/> GPS   57600	Disabled   AUTO

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

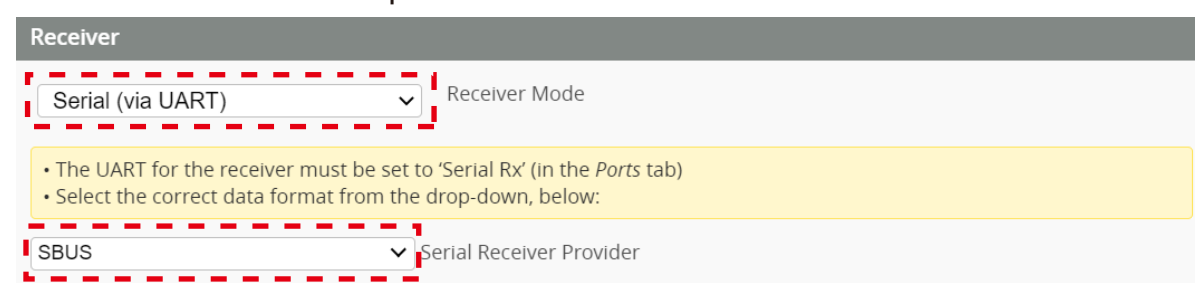
1. On the Ports page, enable MSP on UART3 and change the peripheral to VTX (MSP + DisplayPort).

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

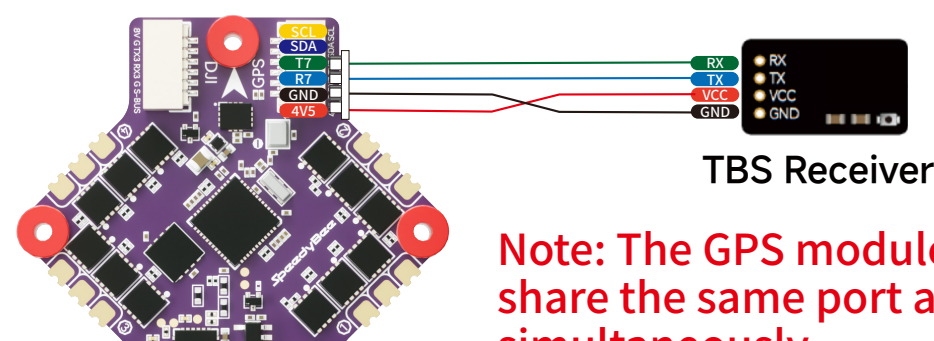
2. If you are using a DJI FPV Remote Controller, disable the serial receiver on UART5, then enable the serial receiver on UART2.

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



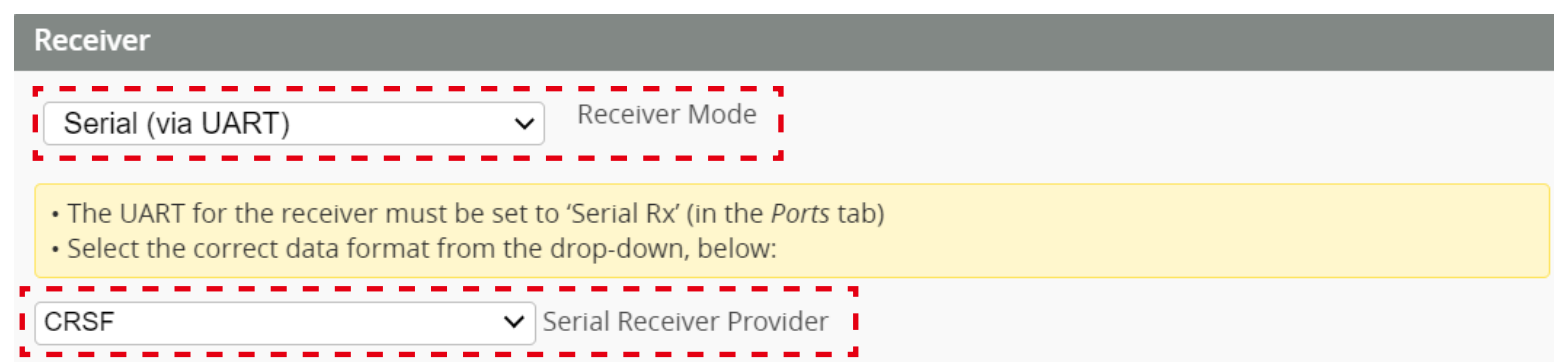
**Note: The GPS module and the TBS Receiver share the same port and cannot be used simultaneously.**

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

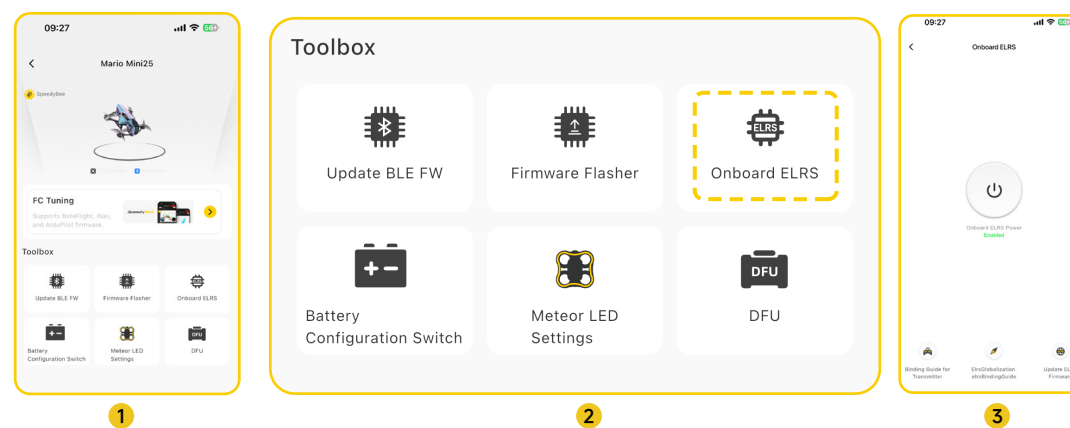
## 03 Wireless Connection Tutorial

### 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.



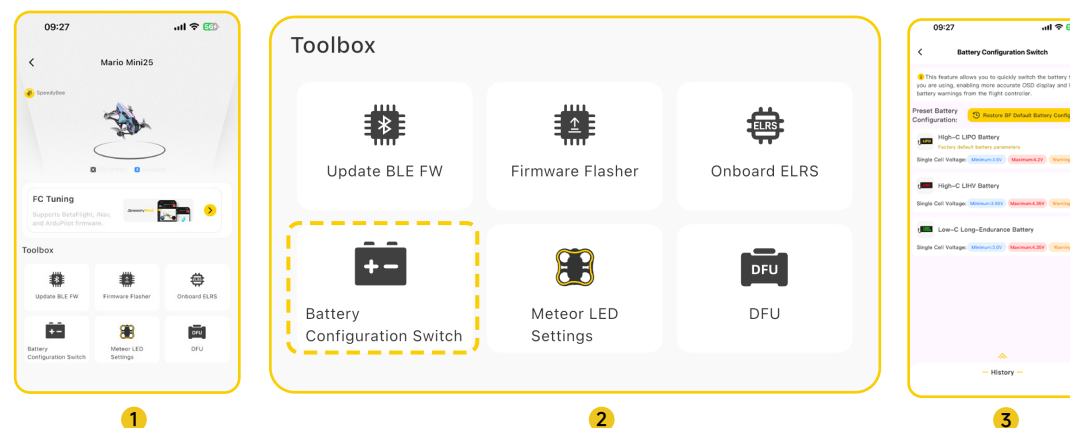
2. In the Toolbox, select the Onboard ELRS feature.

### 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.



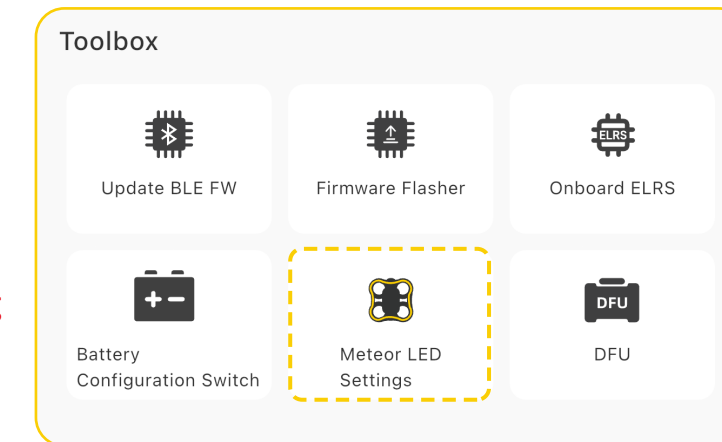
2. In the Toolbox, select the Onboard ELRS feature.

### 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:

1. Power Control: Set the channel corresponding to the LEDLOW mode to high to turn off the LED strip, or low to turn it on.
2. 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