BETAFPV Air 5IN1 Brushless Flight Controller

BETAFPV Air 5IN1 Brushless Flight Controller 1S AIO FC Instruction Manual

Model: Air 5IN1 Brushless Flight Controller | Brand: BETAFPV

1. Introduction

The BETAFPV Air 5IN1 Brushless Flight Controller is a lightweight, high-performance 1S All-In-One (AIO) flight controller designed for FPV Whoop Quadcopters. It integrates a G473 CPU, 16MB BlackBox, BB51 Bluejay 96K ESC, OSD Chip, and a built-in Serial ELRS 2.4G receiver. This manual provides essential information for the proper setup, operation, and maintenance of your flight controller.

2. Package Contents

Please verify all items are present upon unboxing. The package includes:

- 1 * Air Brushless Flight Controller
- 1 * 2.4g Antenna (Only 5IN1 Version)
- 1 * Type-C to SH1.0 Adapter
- 1 * SH1.0 4Pin Adapter Cable
- 1 * 5.8g VTX Antenna
- 1 * BT2.0 U Whoop Cable Pigtail | 40mm
- 4 * M1.4*4 Self-tapping Screws
- 4 * Shock Absorbing Ball

Image: Contents of the BETAFPV Air 5IN1 Brushless Flight Controller package.

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3. Specifications

Flight Controller (FC) Specifications:

- **Weight:** 3.6g (5IN1 Version)
- **Mounting Hole Size:** 26mm x 26mm
- **CPU:** STM32G473CEU6 (168MHz)
- **Six-Axis:** ICM42688P (SPI connection)
- **Blackbox Memory:** 16MB
- **5V BEC:** 5V 3A
- **USB Port:** SH1.0 4-Pin
- **RX:** Serial ELRS 2.4G (V3.4.3) (Only 5IN1 Version)
- **5IN1 Version:** FC+ESC+OSD+VTX+RX

Video Transmitter (VTX) Specifications:

- **Output Power:** 25/100/200/400/PIT
- **Frequency:** 5.8GHz 48 channels, with Raceband: 5658~5917MHz
- **Frequency Control:** PLL

- **All Harmonic:** Max -50dBm
- **Frequency Stability:** ±100KHz (Typ.)
- **Frequency Precision:** ±200KHz (Typ.)
- **Channel Carrier Error:** ±1.5dB
- **Antenna Port:** 50 Ω
- **Operating Temperature:** -10°C~+80°C

Image: The BETAFPV Air 5IN1 Flight Controller on a digital scale, displaying its lightweight design at 3.59 grams.

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4. Setup & Installation

The Air 5IN1 FC is designed for advanced pilots due to its compact and integrated nature. Careful handling and precise connections are crucial.

4.1 Component Overview

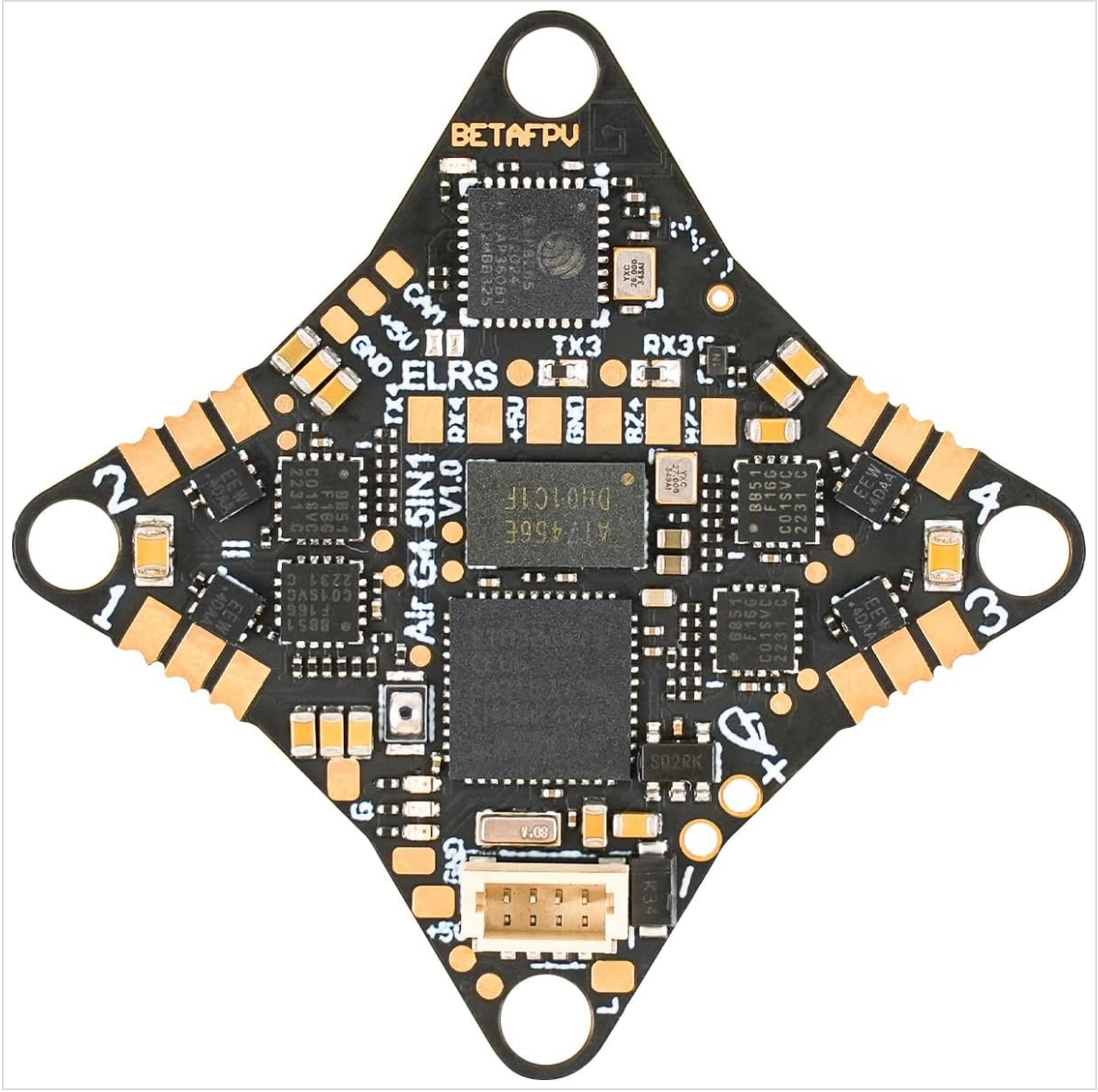

Image: Top view of the BETAFPV Air 5IN1 Flight Controller, showing the main components and layout.

Image: Bottom view of the BETAFPV Air 5IN1 Flight Controller, highlighting solder pads and connectors.

4.2 Port Configuration

The UART2 port is connected with the VTX by default. This flight controller also provides 3 complete full-featured serial ports for external CRSF/SBUS receivers, GPS, HD VTX, or other serial devices. Refer to the diagram below for port details.

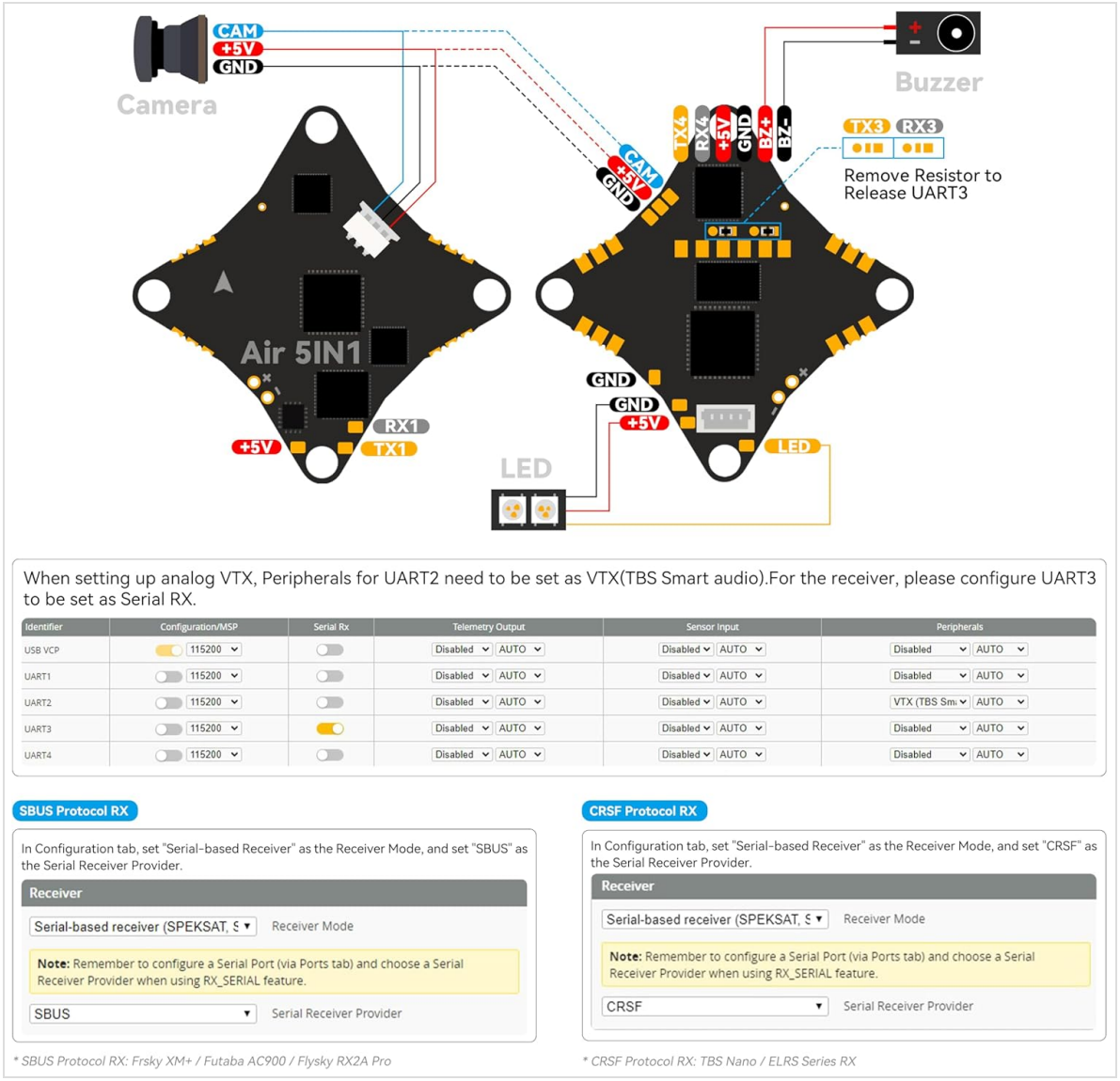

Image: Diagram illustrating the UART port connections and configuration options for the flight controller.

4.3 Detailed Component Labels

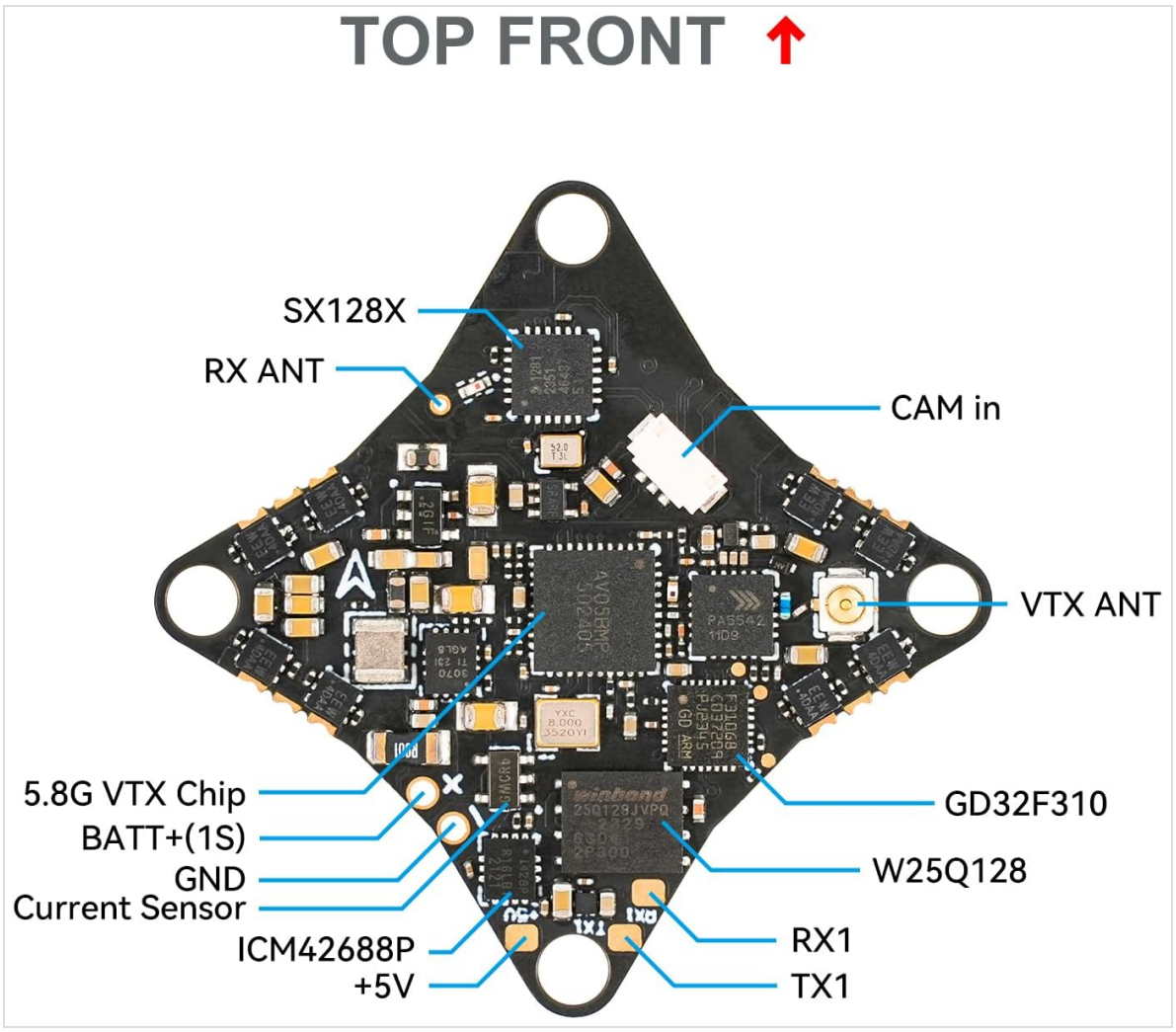

Image: Detailed labeled top view of the BETAFPV Air 5IN1 Flight Controller, identifying key chips and connection points.

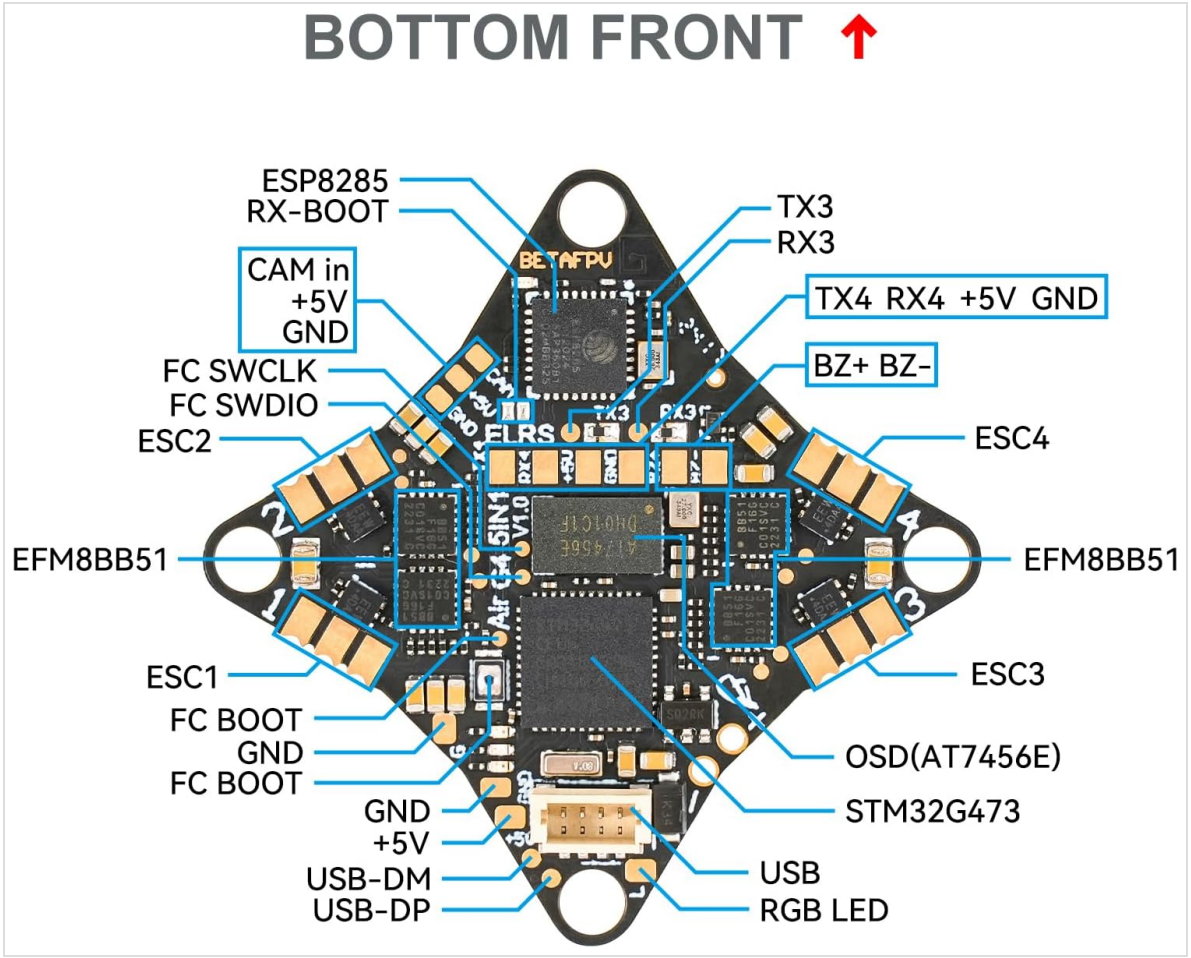

Image: Detailed labeled bottom view of the BETAFPV Air 5IN1 Flight Controller, showing ESCs, OSD, and USB connections.

4.4 Installation Video Guide

For a visual guide on installing a flight controller into a drone, please refer to the following official BETAFPV video. While this video demonstrates installation for a Meteor series drone, the general principles for connecting the flight controller and VTX module are applicable.

Video: Official BETAFPV installation guide for Meteor65 Pro/Meteor75 Pro Brushless Drones. This video demonstrates the physical assembly process, including connecting components like the flight controller and VTX, which can be helpful for understanding the installation of the Air 5IN1 FC.

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5. Operating Guidelines

5.1 VTX Power Settings

The integrated onboard VTX allows power adjustment from 25mW to 400mW. Higher VTX power consumes more energy and generates more heat, which can reduce flight time. For optimal flight time in indoor environments, it is recommended to use 25mW to 100mW power settings.

5.2 Receiver Binding

The Air 5IN1 Brushless Flight Controller integrates a Serial ELRS 2.4G RX with default protocol ELRS and firmware version V3.4.3. Ensure that your binding device (e.g., radio transmitter) uses the same protocol and firmware version for successful binding.

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6. Maintenance

Regular maintenance ensures the longevity and performance of your flight controller.

- **Physical Inspection:** Periodically check all solder joints and connections for any signs of damage or loose contacts.
- **Cable Management:** Ensure all cables, especially coaxial cables and antenna wires, are properly secured and not under tension to prevent damage.
- **Cleanliness:** Keep the flight controller free from dust, dirt, and moisture. Use a soft brush or compressed air for cleaning.

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7. Troubleshooting

If you encounter issues, consider the following common troubleshooting steps:

- **No Power:** Check battery connection and ensure the correct polarity. Verify the flight controller receives power.
- **Binding Issues:** Confirm that your transmitter and the FC's ELRS receiver are on the same protocol and firmware version. Re-attempt the binding process as per ELRS documentation.
- **VTX Signal Problems:** Ensure the VTX antenna is securely connected. Check VTX power settings and frequency for interference.
- **Flight Instability:** Verify all motors are spinning in the correct direction and propellers are installed correctly. Check for any loose components or damaged wires.

For more complex issues, please refer to the official BETAFPV support resources.

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8. Warranty & Support

It is recommended to check the package contents immediately upon arrival to ensure everything is in order. For product support, technical assistance, or warranty inquiries, please visit the official BETAFPV store or contact their customer service.

Visit the BETAFPV Store for Support
