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› Xiangtat F405 AIO 40A Flight Controller & 4-in-1 ESC Combo User Manual

Xiangtat F405 AIO 40A

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Model: F405 AIO 40A

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your Xiangtat F405 AIO 40A Flight Controller and 4-in-1 ESC Combo. This advanced flight controller is designed for FPV drones, quadcopters, and fixed-wing aircraft, offering robust performance and wireless tuning capabilities.

Please read this manual thoroughly before use to ensure proper setup and safe operation.

2. WHAT'S IN THE BOX

- F405 AIO 40A Flight Controller
- 16-Piece Pro Builder Kit (includes soldering practice board, adjustable 5V/9V BEC, Type-C extension + PDB board, DJI adapter cable + HF capacitors)

3. SPECIFICATIONS

Feature	Description
Brand	Xiangtat
Model	F405 AIO 40A
Gyro	ICM-42688P with dedicated LDO power
ESC	40A x 4 (160A continuous / 180A peak total output)
Input Voltage	3-6S LiPo
CPU	STM32F405 (168MHz, 1MB Flash)

Feature	Description
Wireless Connectivity	Bluetooth
UARTs	4x
BEC Output	Adjustable 5V/9V, 3x 5V, 2x 4.5V
Barometer	Built-in (0.5% accuracy)
Blackbox	SD Card Slot (4GB Max)
Dimensions	33mm x 33mm x 8mm (25.5x25.5mm mounting)
Weight	20 Grams (0.705 ounces)
Material	Aluminum and Other Metals (Heatsink)
Special Features	Onboard TVS diode, Rubycon HF capacitors, CNC aluminum heatsink, DJI Plug & Play, GPS-ready

4. SETUP AND INSTALLATION

This section guides you through the physical installation and initial configuration of the F405 AIO 40A Flight Controller.

4.1 Physical Installation

The F405 AIO 40A is designed for 25.5x25.5mm mounting. Ensure proper insulation and secure mounting within your drone frame.



Figure 1: Top and bottom view of the F405 AIO 40A Flight Controller, showing component layout and mounting holes.



Figure 2: Detailed bottom view of the F405 AIO 40A Flight Controller, highlighting the STM32F405, ICM-42688P, and Bluejay JH-40 components.



Figure 3: Angled view of the F405 AIO 40A Flight Controller, showcasing the purple heatsink and USB-C port.

4.2 Wiring Connections

Connect motors, receiver, FPV camera, VTX, and other peripherals according to your drone's configuration. The board features large soldering pads for M1-M8 motor outputs and dedicated pads for various peripherals.

- **Motor Connections:** M1-M4 are typically used for quadcopters. M5-M8 are available for hexacopters or other multi-rotor configurations.
- **Power Input:** Connect your 3-6S LiPo battery to the main battery pads. The board includes an onboard TVS diode and Rubycon HF capacitors for power stability.
- **Receiver:** Connect your receiver to the designated SBUS or other UART pads.
- **FPV System:** Utilize the dedicated cutouts for FPV camera and VTX connections. A DJI adapter cable is included for DJI systems.
- **GPS Module:** The 4.5V output is available for GPS modules.
- **LEDs/Buzzer:** Connect external LEDs and buzzers to their respective pads.

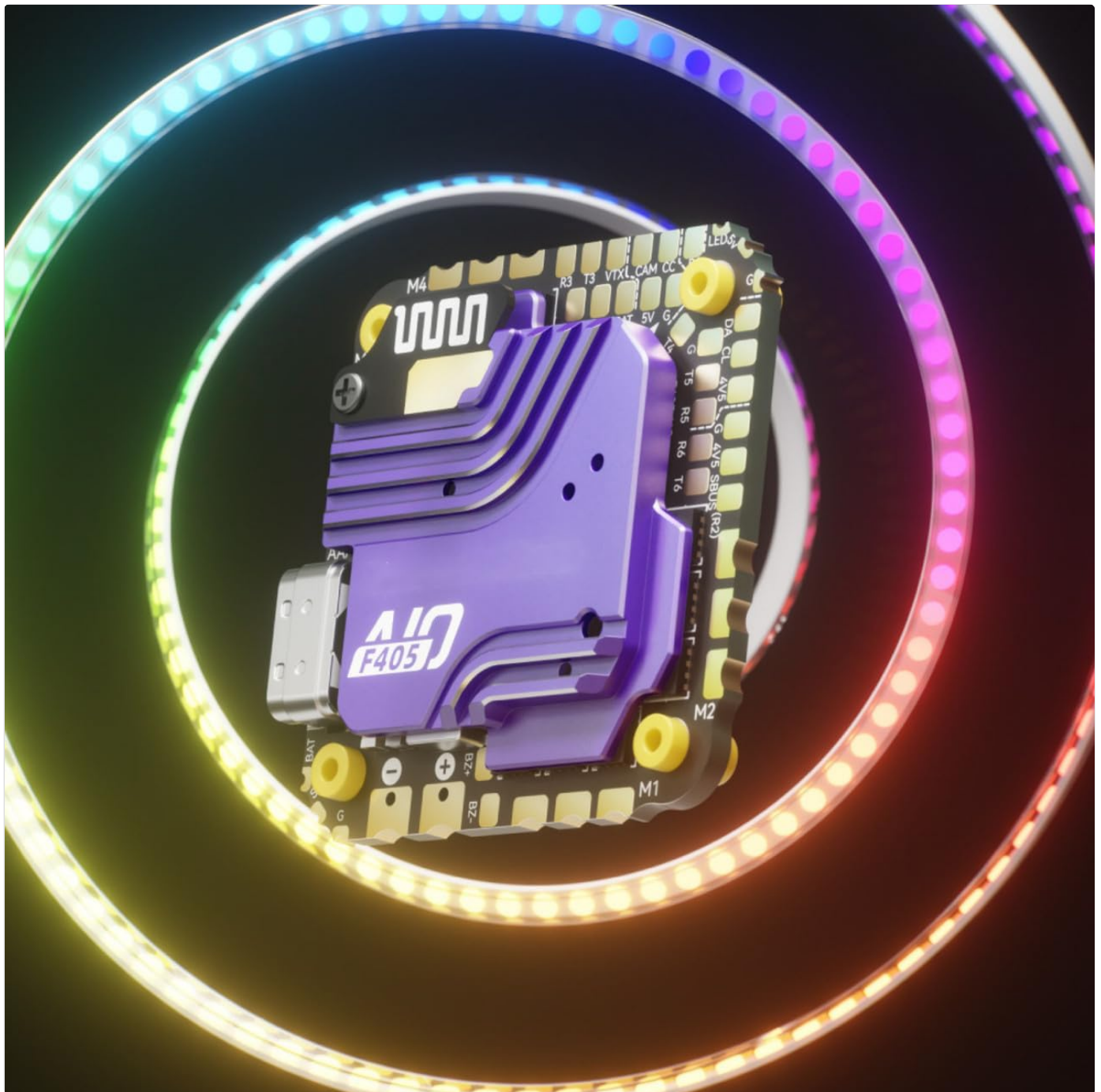


Figure 4: The F405 AIO 40A Flight Controller integrated into a drone setup, surrounded by LED rings, demonstrating its compact size and potential for customization.

4.3 Initial Configuration (Wireless)

The F405 AIO 40A supports wireless configuration via Bluetooth using the SpeedyBee app. This allows for convenient setup without a PC.

1. Download the SpeedyBee app on your smartphone.
2. Power on the flight controller.
3. Open the SpeedyBee app and connect to the flight controller via Bluetooth.
4. Follow the in-app instructions for initial setup, including firmware updates, motor direction changes, and PID tuning.

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Video 1: Overview of the Xiangtat F405 V4 V5 Flight Controller Stack, demonstrating its features and wireless configuration capabilities.

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5. OPERATING INSTRUCTIONS

Once installed and configured, the F405 AIO 40A Flight Controller manages your drone's flight characteristics. Ensure your radio transmitter is properly bound and calibrated.

5.1 Pre-Flight Checks

- Verify battery voltage using the 4-level battery life indicators on the FC.
- Confirm all motors spin in the correct direction (can be configured wirelessly via the app).
- Check control surface responses in your flight controller software.
- Ensure GPS lock if using a GPS module.

5.2 Flight Modes

Refer to your flight controller software (e.g., Betaflight, INAV) documentation for detailed information on configuring and utilizing various flight modes. The F405 AIO's ICM-42688P gyro and barometer provide stable flight performance, including precision altitude hold.

6. MAINTENANCE

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

- **Cleaning:** Keep the board free from dust, dirt, and moisture. Use compressed air or a soft brush for cleaning.
- **Inspections:** Periodically inspect solder joints and connections for any signs of damage or corrosion.
- **Firmware Updates:** Regularly check for and apply firmware updates using the SpeedyBee app or a PC to benefit from performance improvements and bug fixes.
- **Heat Management:** The CNC aluminum heatsink helps manage heat. Ensure adequate airflow around the flight controller, especially during aggressive flights.

7. TROUBLESHOOTING

This section addresses common issues you might encounter.

Issue: Flight controller not powering on.

Solution: Check battery connections and voltage. Ensure the main power leads are correctly soldered and the battery is charged. Verify the onboard TVS diode for any signs of damage.

Issue: Motors not spinning or spinning incorrectly.

- Check motor wiring to the ESC pads (M1-M8).
- Use the SpeedyBee app to verify and adjust motor directions wirelessly.
- Ensure ESC firmware is up-to-date and calibrated.

Issue: Unstable flight or unexpected behavior.

- Verify gyro calibration in your flight controller software.
- Check for vibrations affecting the flight controller.
- Review PID settings; adjust if necessary.
- Ensure proper mounting and insulation to prevent electrical interference.

Issue: Cannot connect via Bluetooth.

- Ensure the flight controller is powered on.
- Check your smartphone's Bluetooth settings.
- Restart the SpeedyBee app and the flight controller.
- If wireless DFU is not working, connect via USB-C to a PC for firmware updates.

8. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the manufacturer's official website or contact your retailer. Keep your proof of purchase for warranty claims.
Manufacturer: **Xiangtat**
For additional resources and community support, visit FPV drone forums and online communities.

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Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question