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› SpeedyBee F405 WING APP Flight Controller User Manual

SpeedyBee SG4084

SpeedyBee F405 WING APP Flight Controller User Manual

Model: SG4084

1. INTRODUCTION AND OVERVIEW

The SpeedyBee F405 WING APP Flight Controller is a highly integrated and versatile flight control system designed specifically for fixed-wing aircraft, including conventional layouts and V-tail planes. It supports both ArduPilot and INAV firmware, offering robust performance and extensive customization options. This flight controller stack simplifies the setup process with wireless configuration capabilities via the SpeedyBee and QGroundcontrol mobile applications, eliminating the need for constant physical connections.

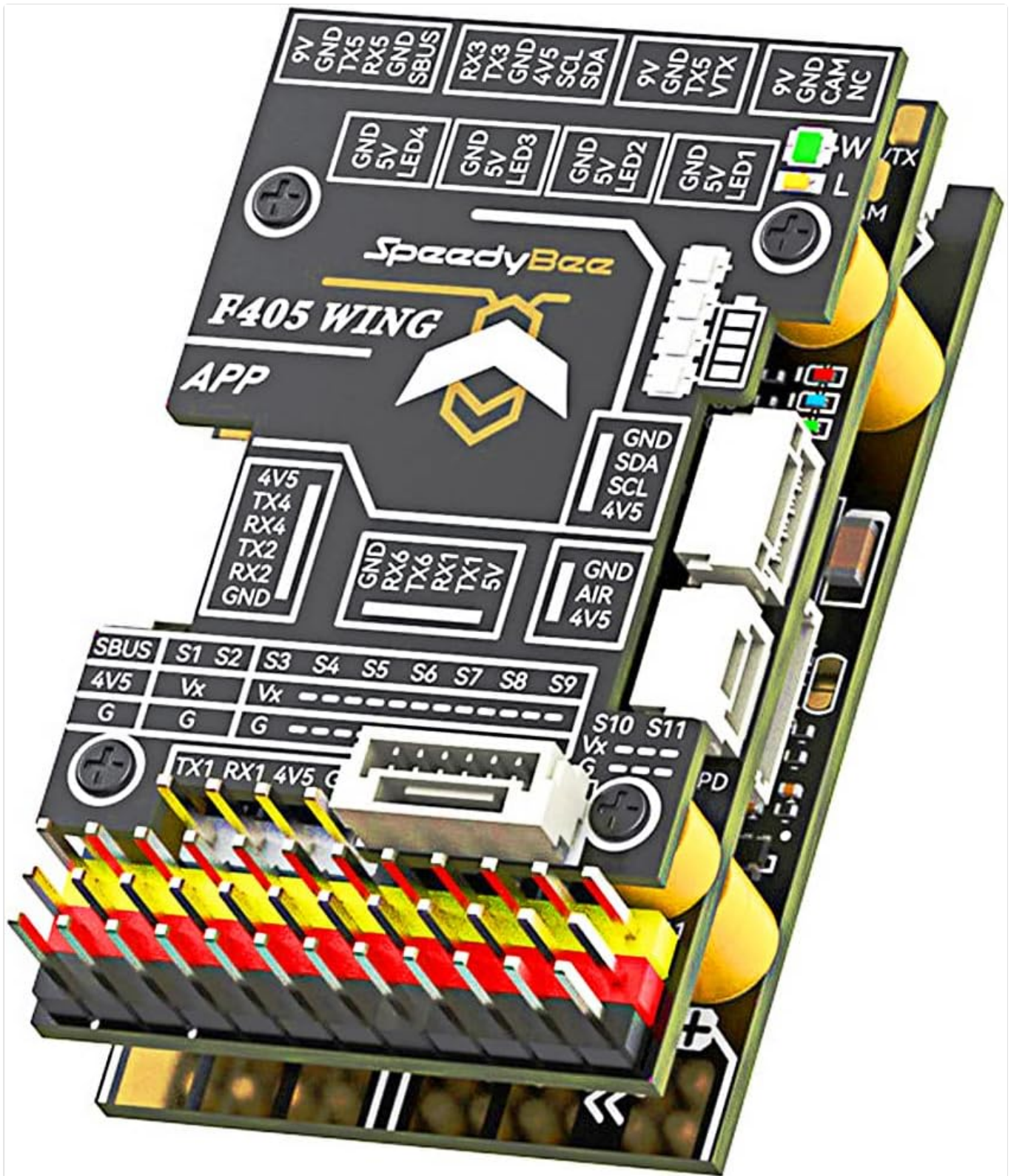


Image: The SpeedyBee F405 WING APP Flight Controller, showcasing its compact, stacked design with multiple connection ports.

Key Features:

- **Wireless Configuration:** Supports wireless setup via SpeedyBee and QGroundcontrol apps for convenient parameter adjustments.
- **Robust Power Supply:** Features up to 3 high-power BECs with large heat dissipation areas for stable and reliable operation.
- **Reduced Sensor Interference:** Multi-layer PCB design with separate layers for power supply, FC, and function modules to minimize interference.
- **Integrated LED Control:** Includes 4 LED strip outputs with connectors, allowing for customizable lighting effects

without soldering.

- **Wide Application:** Compatible with various fixed-wing aircraft types, including conventional and V-tail configurations.
- **Full MCU Pin Breakout:** Provides up to 6 UART ports for easy expansion and connection of external modules like GPS, Digital VTX, and airspeed sensors.

2. PACKAGE CONTENTS

Before beginning installation, please verify that all components listed below are present in your package. If any items are missing or damaged, contact your retailer immediately.

Package



SpeedyBee
F405 WING FC board x1



SpeedyBee
F405 WING PDB board x1



SpeedyBee
F405 WING Wireless board x1



SpeedyBee
F405 WING USB extender x1



90 Degree pin
Header(3x12) x1



straight pin header(1x12) x3



White straight pin
header(1x4) x1



M2 x 12 copper
Standoff Spacer x5



M2x4 small head cross screw x10



M3x4 mm Silicone Grommets x5

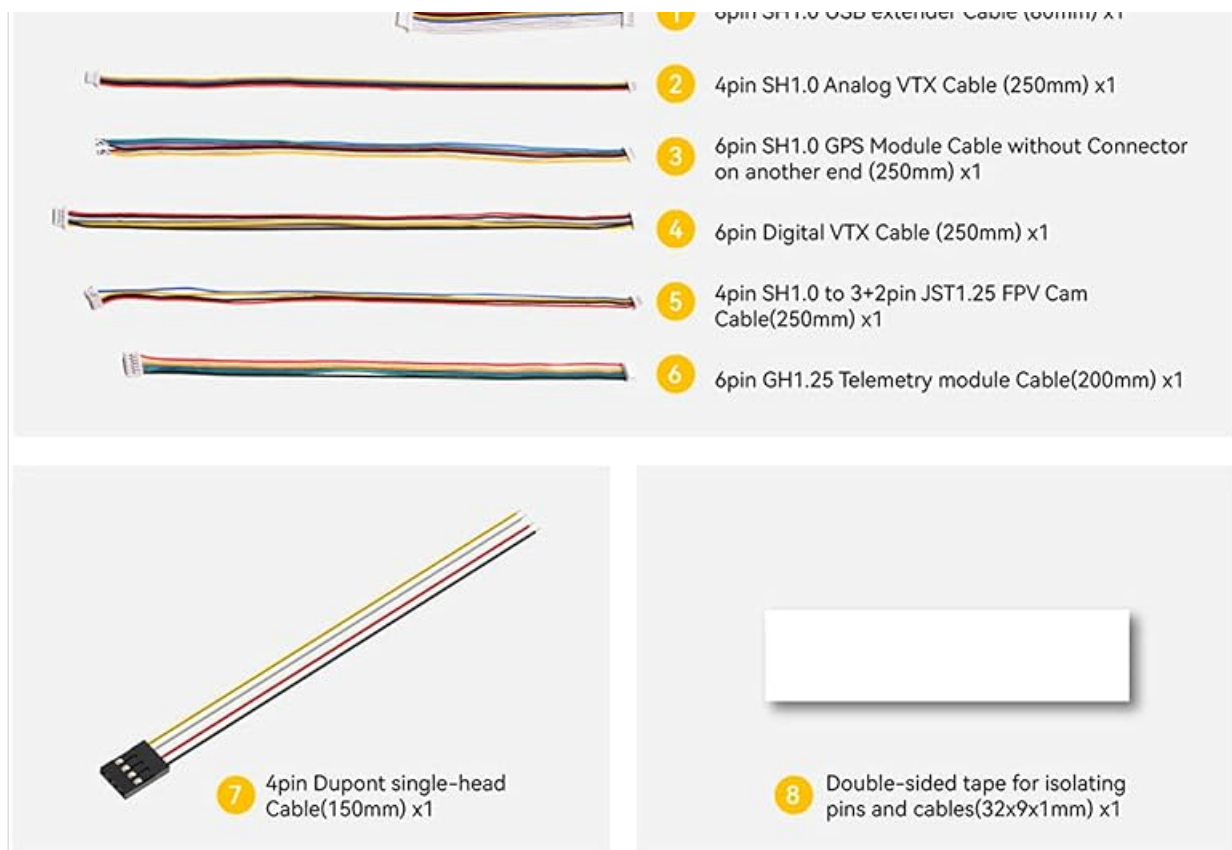


Image: Detailed view of all components included in the SpeedyBee F405 WING APP Flight Controller package, showing the FC board, PDB board, wireless board, USB extender, various pin headers, screws, spacers, grommets, and connection cables.

- SpeedyBee F405 WING FC board x1
- SpeedyBee F405 WING PDB board x1
- SpeedyBee F405 WING Wireless board x1
- SpeedyBee F405 WING USB extender x1
- 90 Degree pin header (2x12) x1
- Straight pin header (1x12) x3
- White straight pin header (1x4) x1
- M2 x 12 Copper Standoff Spacer x5
- M2x4 small head cross screw x10
- M3x4 mm Silicone Grommets x5
- 8pin SH1.0 USB extender Cable (80mm) x1
- 2pin SH1.0 Analog VTX Cable (250mm) x1
- 6pin SH1.0 GPS Module Cable without Connector on another end (250mm) x1
- 4pin Digital VTX Cable (250mm) x1
- 4pin SH1.0 to 3+2pin JST1.25 FPV Cam Cable (250mm) x1
- 6pin GH1.25 Telemetry module Cable (200mm) x1
- 4pin Dupont single-head Cable (150mm) x1
- Double-sided tape for isolating pins and cables (32x9x1mm) x1

3. PRODUCT DIMENSIONS

Understanding the physical dimensions of the SpeedyBee F405 WING APP Flight Controller is crucial for proper integration into your aircraft. The compact design allows for flexible mounting options.

Dimensions

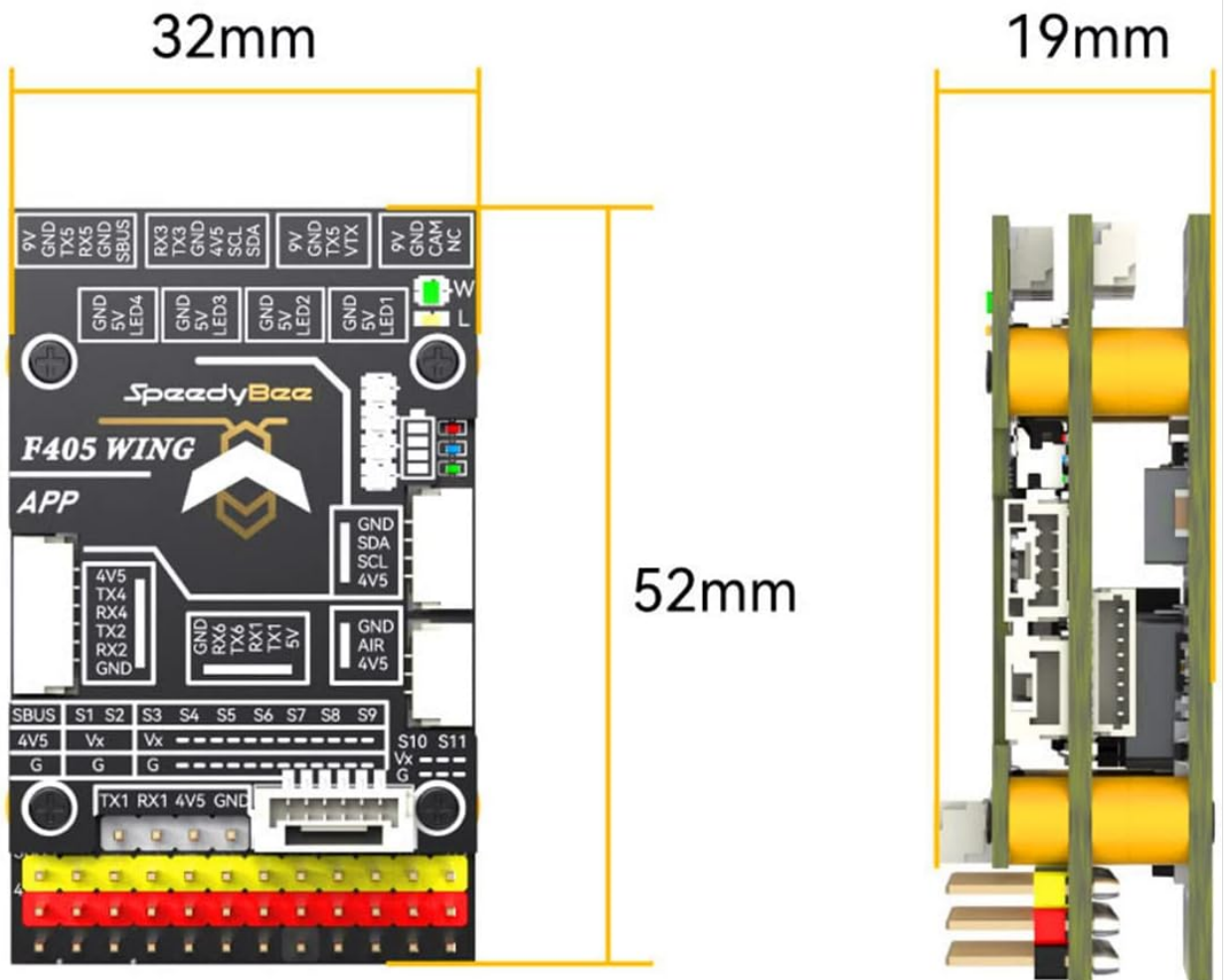


Image: Technical drawing illustrating the dimensions of the SpeedyBee F405 WING APP Flight Controller: 52mm (Length) x 32mm (Width) x 19mm (Height).

Length (L): 52 mm

Width (W): 32 mm

Height (H): 19 mm

4. SETUP AND WIRING

Proper wiring is essential for the safe and correct operation of your flight controller. The SpeedyBee F405 WING APP offers both plug-and-play and direct soldering options for various peripherals.

4.1 Wiring Method 1: Plug and Play

This method utilizes the included connectors and cables for a solder-free installation, ideal for quick assembly and

Wiring Diagram

Method 1: Plug and play

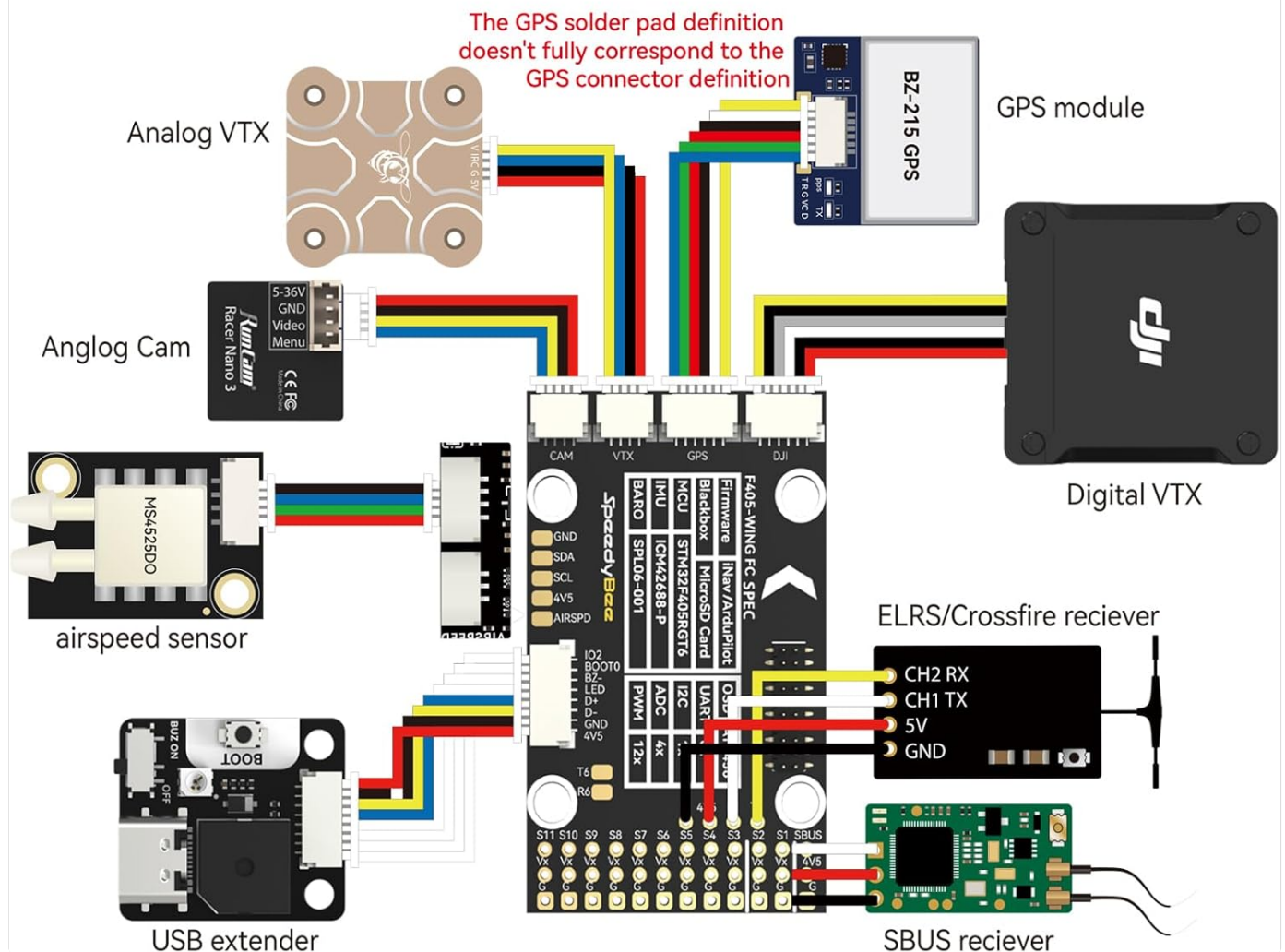


Image: Wiring diagram for Method 1 (Plug and Play), showing connections for GPS module, Analog VTX, Digital VTX, Analog Camera, Airspeed Sensor, USB Extender, ELRS/Crossfire Receiver, and SBUS Receiver using pre-terminated cables.

4.2 Wiring Method 2: Direct Soldering

For a more permanent and compact installation, direct soldering provides a secure connection. This method is recommended for experienced users.

Method 2, Direct soldering.

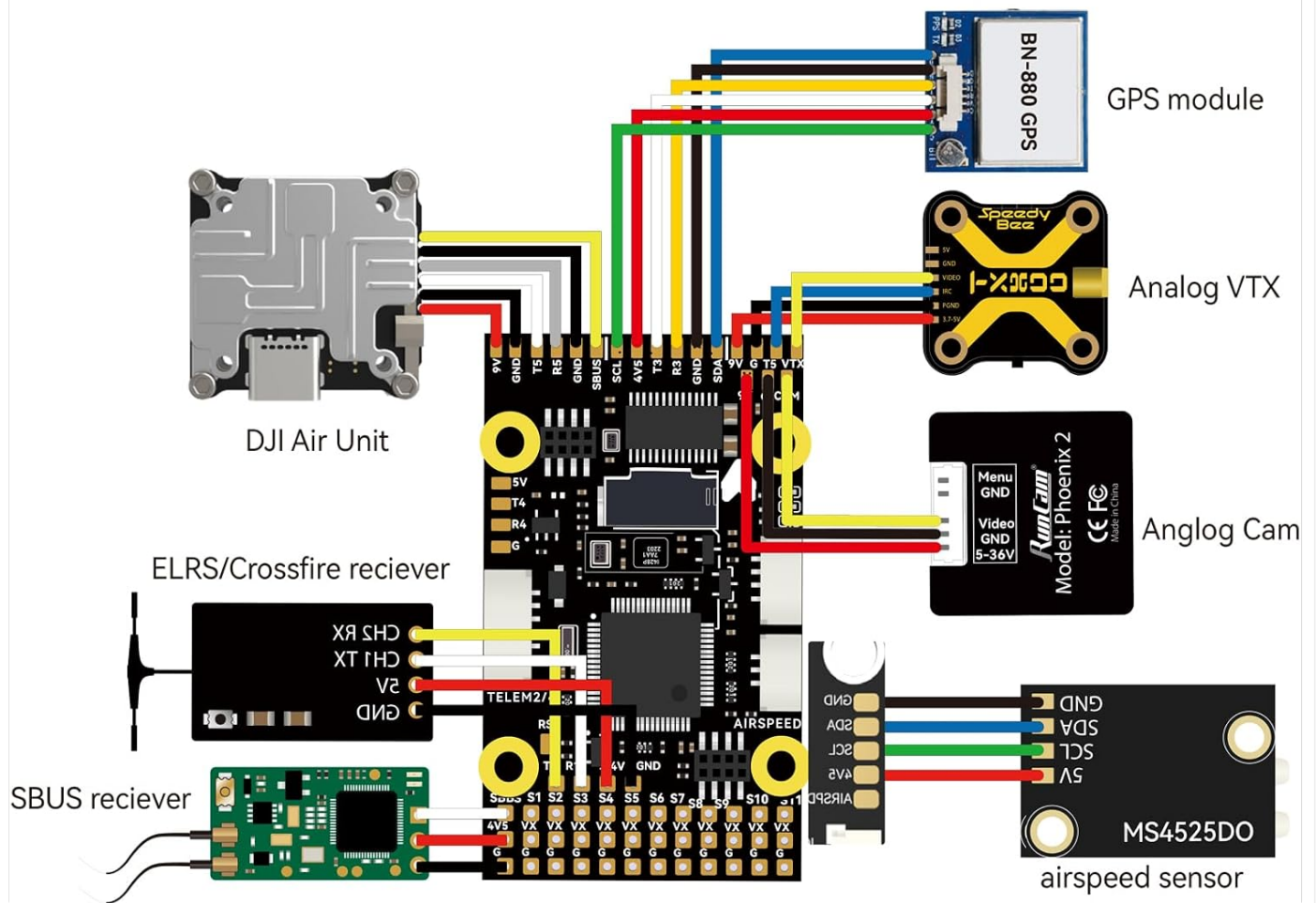


Image: Wiring diagram for Method 2 (Direct Soldering), illustrating solder pad connections for DJI Air Unit, GPS module, Analog VTX, Analog Camera, Airspeed Sensor, ELRS/Crossfire Receiver, and SBUS Receiver.

4.3 UART Port Breakout

The flight controller features a full MCU pin breakout with multiple UART ports, allowing for extensive connectivity with various external modules without interface selection issues.

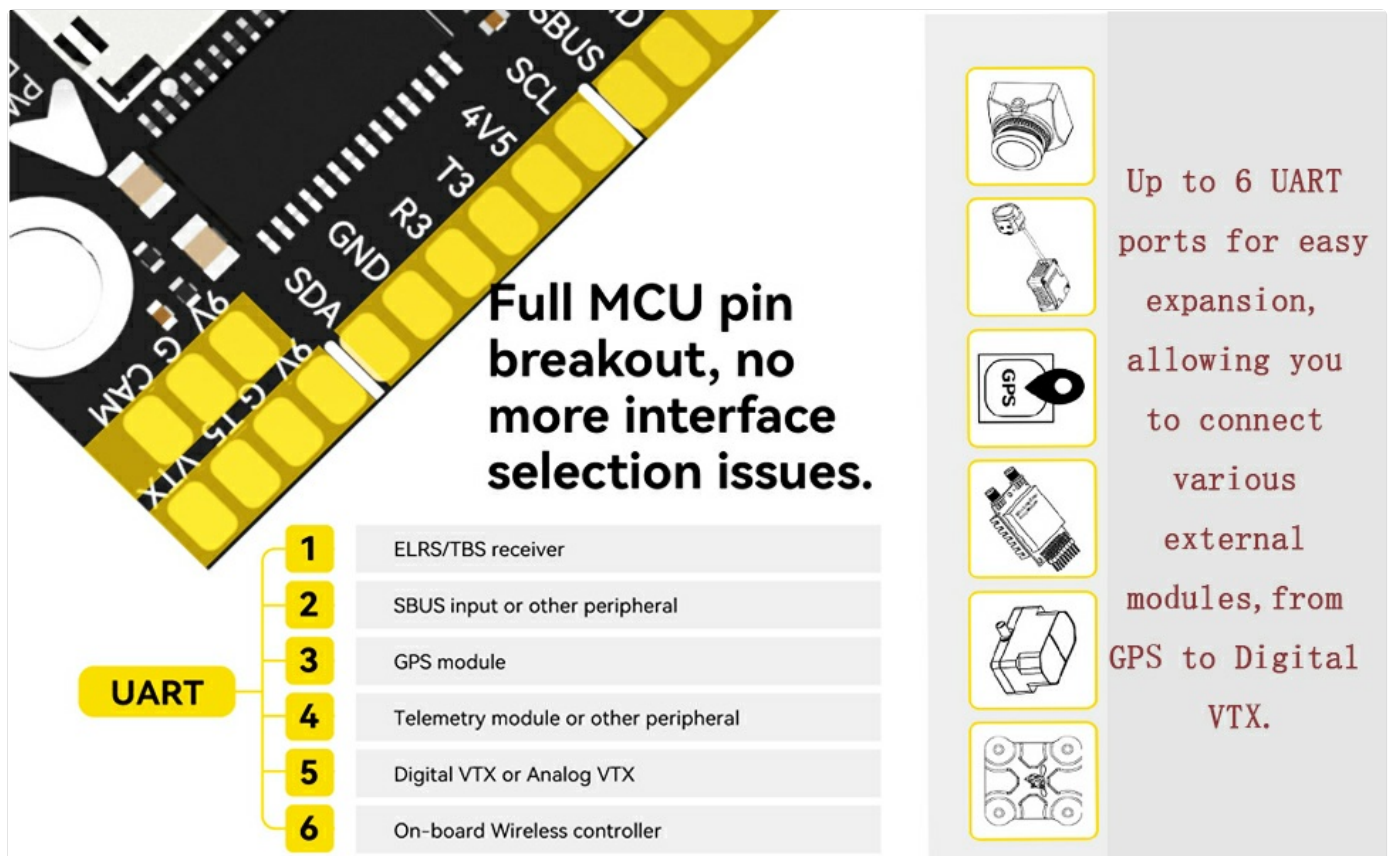


Image: Diagram showing the six UART ports and their typical uses: UART1 for ELRS/TBS receiver, UART2 for SBUS input or other peripherals, UART3 for GPS module, UART4 for Telemetry module or other peripherals, UART5 for Digital VTX or Analog VTX, and UART6 for the On-board Wireless controller.

4.4 Wireless Configuration

The SpeedyBee F405 WING APP supports wireless configuration via Bluetooth and Wi-Fi, allowing you to adjust settings and calibrate sensors using the SpeedyBee or QGroundcontrol mobile applications.

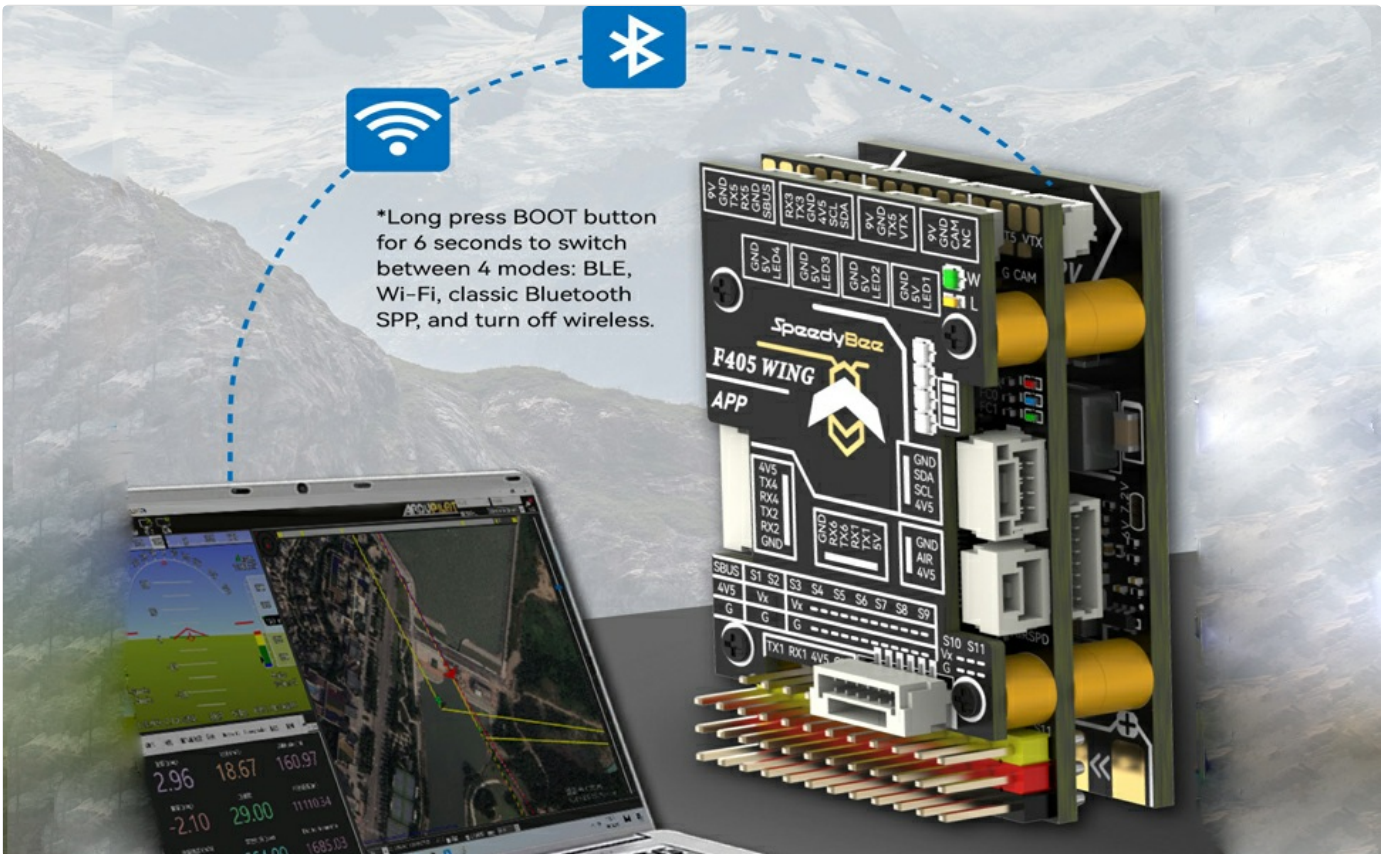


Image: Illustration of the SpeedyBee F405 WING APP Flight Controller wirelessly connected to a laptop, demonstrating Wi-Fi and Bluetooth connectivity for configuration.

To switch between wireless modes (BLE, Wi-Fi, classic Bluetooth SPP, or turn off wireless), long press the BOOT button for 6 seconds.



Image: A hand holding a smartphone displaying the SpeedyBee app interface, showing accelerometer calibration steps for a fixed-wing aircraft, highlighting the ease of wireless setup.

5. OPERATING INSTRUCTIONS

Once installed and configured, the SpeedyBee F405 WING APP Flight Controller is ready for flight. It operates with either ArduPilot or INAV firmware, providing advanced flight stabilization and navigation capabilities.

5.1 LED Light Functions

The flight controller includes outputs for 4 LED strips, enhancing visibility and aesthetics of your aircraft. Short press the BOOT button to cycle through different lighting effects.

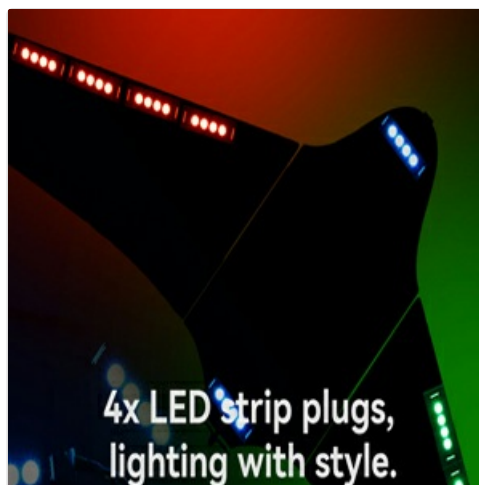


Image: Close-up view of the flight controller showing integrated LED strip plugs, indicating support for external LED lighting for visual flair.

5.2 Power Supply Management

The flight controller is equipped with multiple high-power BECs (Battery Eliminator Circuits) to provide stable voltage to all connected components, ensuring reliable operation even under demanding conditions.

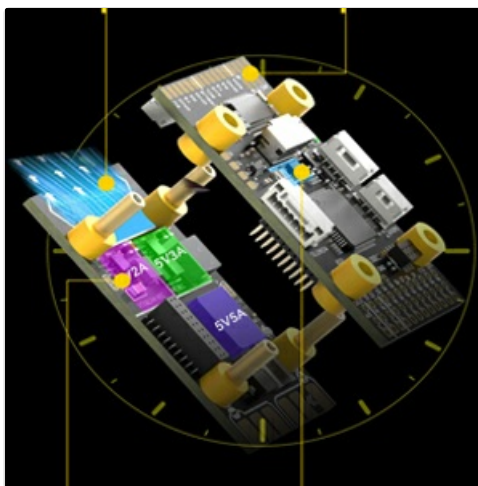


Image: Diagram illustrating the internal power supply components, highlighting the 9V 2A, 5V 3A, and 5V 5A BECs designed for efficient power distribution and heat dissipation.

6. MAINTENANCE

To ensure the longevity and optimal performance of your SpeedyBee F405 WING APP Flight Controller, regular maintenance is recommended:

- **Keep Clean:** Regularly inspect the board for dust, dirt, or debris. Use compressed air or a soft brush to gently clean the components.
- **Inspect Connections:** Periodically check all soldered joints and connector pins for looseness or corrosion. Re-solder or secure as necessary.
- **Firmware Updates:** Keep the flight controller firmware (ArduPilot or INAV) updated to the latest stable version to benefit from bug fixes and new features. Refer to the respective firmware documentation for update procedures.
- **Environmental Protection:** Protect the flight controller from moisture, extreme temperatures, and direct sunlight. Consider using a protective enclosure if flying in harsh conditions.

7. TROUBLESHOOTING

If you encounter issues with your SpeedyBee F405 WING APP Flight Controller, consider the following troubleshooting steps:

- **No Power/No Lights:** Verify power input (2-6S LiPo) and check all power connections. Ensure the battery is charged and correctly connected to the PDB.
- **Connection Issues (USB/Wireless):** Ensure correct drivers are installed for USB connection. For wireless, check that the flight controller is in the correct mode (BLE/Wi-Fi) by long-pressing the BOOT button. Restart the SpeedyBee/QGroundcontrol app and your mobile device.
- **Sensor Errors (e.g., Barometer):** Check for any physical damage to the sensor area. Ensure the flight controller is mounted securely and free from vibrations. If using INAV/ArduPilot, check sensor calibration and configuration settings within the configurator.
- **Unsoldered Pins:** Some units may require soldering of pin headers. If experiencing intermittent connections, inspect all pin header connections for proper soldering.

- **Flight Instability:** Re-check all wiring according to the diagrams. Ensure proper sensor calibration (accelerometer, gyroscope, compass). Verify PID tuning and flight mode settings in your chosen firmware (ArduPilot/INAV).
- **Firmware Flashing Issues:** Ensure the correct firmware target is selected. Use a reliable USB cable and port. Try a different computer if issues persist.

For persistent issues, consult the official SpeedyBee support resources or community forums for detailed troubleshooting guides and assistance.

8. SPECIFICATIONS

Detailed technical specifications for the SpeedyBee F405 WING APP Flight Controller:

	Product Name	SpeedyBee F405 WING APP
	TOP Board	SpeedyBee F405 WING Wireless Board
	FC Board	SpeedyBee F405 WING FC Board
	PDB Board	SpeedyBee F405 WING PDB Board
	USB extender	SpeedyBee F405 WING USB extender
	Wireless configuration	Supported
	LED strip controller	Supported
	Battery level indicator	Supported
	FC Firmware	INAV / Ardupilot
	Power Input	2-6S LiPo
	Dimension	52 (L) x 32 (W) x 19 (H) mm
	Weight	35g (with USB extender)

Image: A table summarizing the key specifications of the SpeedyBee F405 WING APP Flight Controller, including board names, supported features, firmware, power input, dimensions, and weight.

Product Name	SpeedyBee F405 WING APP
TOP Board	SpeedyBee F405 WING Wireless Board
FC Board	SpeedyBee F405 WING FC Board
PDB Board	SpeedyBee F405 WING PDB Board
USB extender	SpeedyBee F405 WING USB extender
Wireless configuration	Supported
LED strip controller	Supported
Battery level indicator	Supported

FC Firmware	INAV / ArduPilot
Power Input	2-6S LiPo
Dimension (L x W x H)	52 x 32 x 19 mm
Weight	35g (with USB extender)

9. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official SpeedyBee website or contact your point of purchase. Keep your proof of purchase for any warranty claims.

You can also visit the [SoloGood Store on Amazon](#) for additional product information and resources.

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