

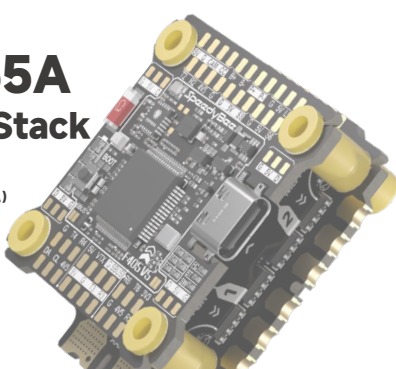
Hi, my friend, we meet again! Welcome to use SpeedyBee. May every takeoff be a journey in pursuit of the ultimate limit.

Next, we have prepared a Quick Start Guide to help you get started with ease and unlock infinite possibilities! Please refer to the following content. (This product is restricted to use in model aircraft/for entertainment purposes only)

F405 V5 OX32 55A

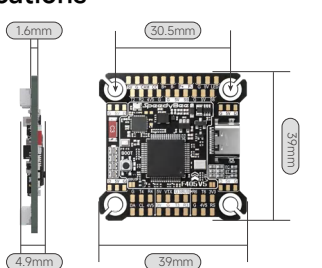
30x30 Model Aircraft Stack User Manual

(New products require activation before use. Please scan the manual QR code and follow instructions.)



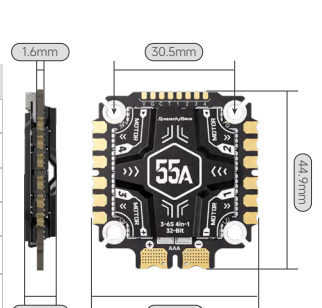
I. F405 V5 Model Aircraft FC Specifications

Product Name	SpeedyBee F405 V5 30.5x30.5 Model Aircraft FC
Bluetooth Tuning	Supported
Flight Controller Firmware	Supported
Power Input	3-6S
Mounting	30.5 x 30.5mm (4mm hole size)
Dimension	39mm(L) x 39mm(W) x 4.9mm(H)
Weight	8.1g
Main Control Chip	STM32F405
Gyroscope	ICM-42688P
Barometer	SPAD06-001
Blackbox	Supported built-in 16MB storage chip
Flight Controller Firmware	SPEEDYBEEF405V5



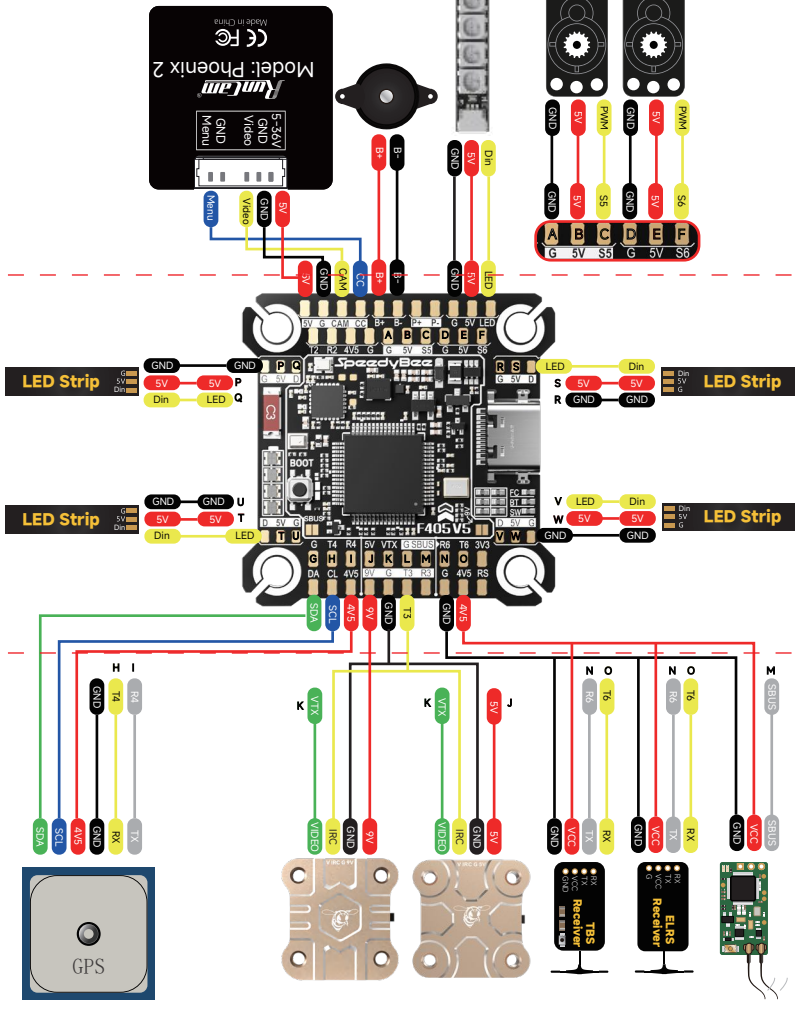
II. Model Aircraft ESC Specifications

Product Name	SpeedyBee OX32 55A 30x30 4-in-1 Model Aircraft ESC
Rated current	55A (single channel), 220A (four channels)
Maximum Current	70A (single channel), 280A (four channels)
Power Input	3-6S
Mounting	30.5 x 30.5mm (4mm hole size)
Dimension	40.9 mm (L) x 44.9 mm (W) x 8.0 mm (H) (including heatsink)
Weight	19.1g



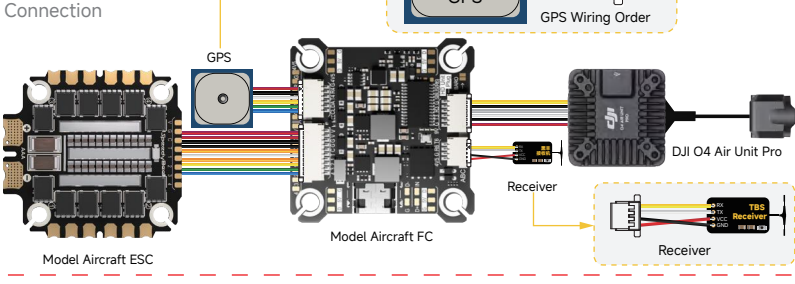
III. Connection of External Devices of Model Aircraft FC

Soldered Connection



IV. Connection of External Devices of Model Aircraft FC

Direct Plug-in Connection



V. Settings

(I) Settings of TBS Receiver/ELRS Receiver

Identifier	Configuration/MSP	Serial Rx
UART5	115200	Off
UART6	115200	On

Receiver

Serial (via UART) Receiver Mode

(II) Settings of SBUS Receiver

When using an SBUS receiver, the SBUS pad needs to be short-circuited.

Identifier	Configuration/MSP	Serial Rx
UART5	115200	Off
UART6	115200	On

Receiver

Serial (via UART) Receiver Mode

SBUS Serial Receiver Provider

(III) Settings of Analog VTX

Identifier	Configuration/MSP	Peripherals
UART2	115200	Disabled - AUTO
UART3	115200	Disabled - AUTO

Setting Procedures

- In the Ports tab, set the Peripherals for UART3 to VTX (IRC Tramp) and save it.
- In the CLI tab, enter the following command: set osd_displayport_device = MAX7456
- In the OSD interface, set the Video Format to Auto.

VI. Air Unit Connection and Settings

HD VTX Connection and Settings:

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200	On	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	Disabled - AUTO
UART4	115200	Off	Disabled - AUTO	Disabled - AUTO	Disabled - AUTO
UART5	115200	Off	Disabled - AUTO	Disabled - AUTO	Disabled - AUTO
UART6	115200	Off	Disabled - AUTO	Disabled - AUTO	Disabled - AUTO

Setting Procedures

- In the Ports tab, set the Sensor Input for UART4 to GPS.
- In the Configuration tab, enable GPS.
- Select the corresponding protocol according to the GPS used.

VII. LED Indicator Light

Battery 90%-100%-4 LED lights are always on.

Battery 75%-90%-3 LED lights are always on. + The top LED light flickers.

Battery 25%-75%-2-3 LED lights are always on.

Battery approx. 10%-25%-1 LED light is always on.

Battery below 10%-1 LED light flickers. (low battery warning)

You can adjust the minimum and maximum cell voltages in the "Power & Battery" settings of Betaflight according to the used battery type so as to accurately control the display status of the battery level indicator light.

Model Aircraft FC Status Light

Model Aircraft FC Status Indicator Light (Blue)
Controlled by the Model Aircraft FC firmware. When the firmware runs normally, the blue light will flicker.

Bluetooth Status Indicator Light (Green)
Controlled by the Bluetooth module. When Bluetooth is not connected: Green light flickers. When Bluetooth is connected: Green light is always on.

LED Control Mode Indicator Light
It is used to indicate that 4 groups of LED strips (LED1-LED4) soldered at the four corners of the Model Aircraft FC. On: LED strips are controlled by the Bluetooth chip. In this state, when the Model Aircraft FC is powered on, the LED strips display the motor mode. Short press the BOOT button to cyclically switch the colors or display modes of 4 groups of LED strips. Off: LED strips are controlled by the Model Aircraft FC firmware. Long press the BOOT button for 3s to switch the LED control mode (switch between Bluetooth chip and Model Aircraft FC firmware).

Power Indicator Lights

- 5V BEC Indicator Light: It is always on when 5V BEC output is normal.
- 9V BEC Indicator Light: It is always on when 9V BEC output is normal.
- 4.5V Indicator Light: It is always on when 4.5V voltage output is normal.
- VBAT Power Indicator Light: It is always on when main power (VBAT) input is normal.
- 3.3V Indicator Light: It is always on when 3.3V voltage output is normal.
- Internal 5V BEC Indicator Light: It is always on when internal 5V BEC output is normal.

Motor and Power Cable Connection

Tip: To protect the Model Aircraft FC and Model Aircraft ESC from burning caused by transient voltage spiking during power-on, it is strongly recommended to use the 1000uF solid capacitor.

VIII. Settings of Motor Order and Direction

Motor Settings:

Setting Procedures

Before adjusting motor settings, remove all propellers to prevent injury!

- Enter the motor page and click "Reorder motors".
- Enable the "I Understand the Risks" switch, and then click the "Start" button.
- Point the nose forward, match each motor to its corresponding image according to the motor rotation order, and then click the "Save" button.

Reorder motors

Safety notice
Remove all propellers to prevent injury! The motors will spin up!

Information notice
Motors will spin up one by one and you will be able to select which motor is spinning. The battery should be plugged in and the correct ESC protocol must be set up in the Motors tab. Note that not all Dshot ESCs will work with this dialog. Check your ESC firmware.

Ready! Check the motors spinning order by clicking on the image.

Settings of Motor Direction

Setting Procedures

Before adjusting motor settings, remove all propellers to prevent injury!

- Enter the motor page and click "Motordirection".
- Enable the "I Understand the Risks" switch, and then click the "Wizard" button.
- Point the nose forward, tap the motor to observe whether the rotation direction matches the diagram. If not, click the corresponding motor number to adjust its rotation direction individually.

Motor Direction--Warning: Ensure props are removed!

Safety notice
Remove all propellers to prevent injury! The motors will spin up immediately when selected!

Information notice:
To change the motor directions, the battery must be plugged in and the correct ESC protocol must be set up in the Motors tab. Note that not all Dshot ESCs will work with this dialog. Check your ESC firmware.

Wizard Resets all motor spin directions, then allows the user to choose which to reverse.

Individually Set motor spin direction by selecting and spinning each motor individually.

IX. Use of Function Accessories

Short-circuit Protection
Support power-on contact protection and output enabling protection to effectively prevent accidental short circuit.

Current Limiting Protection
Support two current limit levels (1A/2A), and freely switch them according to actual needs.

High Current Timeout Protection
After output is enabled at the 2A level and if current continuously exceeds 1.5A for 60s, output will be automatically cut off to prevent circuit overload.

Real-time Display of Voltage and Current
The 7-segment display alternately displays current battery voltage and output current, helping users monitor the operation status in real time and avoid misoperation.

Secondary Hardware Short-circuit Protection
An onboard 2A fuse provides additional protection, effectively preventing damage if software protection fails.

Instructions for Use:

- After powering on with a 4-6S battery, the 7-segment display will display the current battery voltage.
- After pressing the [1A/2A] button to switch the current protection level, the 7-segment display will display the selected level.
- The power output switch can be enabled or disabled through the [ON/OFF] button.
- The short-circuit protection module does not support the voltages above 6S. Using batteries exceeding 6S may cause damage to the module.

Usage Tips:

- When the output is enabled, the indicator light [ON] will light up. If there is voltage input at the back end, this light will also light up.
- After output is enabled, the nixie tube will alternately display current voltage and current values.
- You cannot switch the current protection level while the output is enabled. To switch it, please disable the output, and then set the protection level again.
- If the output current continuously exceeds 1.5A for 60s, the protector will automatically disable the output.
- If the red indicator light flickers, it means the software protection has failed, and short circuit or overcurrent has occurred at the back end. It triggers secondary hardware protection. Please disconnect the battery immediately.

2. Type-C Extension Module

By connecting the Type-C extension module, the Type-C port can be extended outside the device, which prevents the failure of USB cable to connect with the onboard Type-C port after assembly.

4. Active Buzzer

When the drone loses connection, lands in grass, or goes missing, the buzzer can be triggered via the remote control, helping you quickly locate the drone, and improving seeking efficiency.

3. Soldering Practice Board

The attached soldering practice board has various pad sizes. It is recommended to practice on the board before soldering.

Function Accessory Connection and Settings

1. Type-C Extension Module Connection

2. Buzzer Connection and Settings

Setting Procedures

- Enter the configuration page, and enable RX_LOST and RX_SET switches.
- Enter the mode page, scroll down to find BEEPER, click the "Add Range" button, select the AUX auxiliary channel, drag the buzzer enabling range to a suitable position, and then click the "Save" button.

X. APP Connection

5. If pressing the BOOT button is inconvenient during assembly, you can use the APP's DFU function to wirelessly trigger the Model Aircraft FC and enter a recovery mode.

XI. Precautions

- Please flash the firmware and configuration files that match the model of Model Aircraft FC. Otherwise, some functions may not work normally.
- Bluetooth port is set to UART1 by default. Disabling UART1 will affect the Bluetooth function.
- Don't place wires, magnetic materials, and RF components near the gyroscope so as to prevent any interference.
- After assembly, check whether the wiring is correct. Keep the Model Aircraft FC clean, and avoid excess soldering tin residue.
- Don't use the device in a humid, high-temperature, or harsh environment so as to avoid any damage.
- To absorb reverse electromagnetic force from the motor, the Model Aircraft ESC must be used with the original capacitor board and connected with 20awg or thicker silicone wires no longer than 12cm. Failure to do so may cause the Model Aircraft ESC to stop working during operation.
- Wear anti-static aids during operation. All soldering equipment must be grounded so as to avoid electrostatic short circuit.
- Parental and professional guidance are required for users under 18.

<https://www.speedybee.com/>