

SpeedyBee Stack

BLS 50A 30x30

F405 V3

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SpeedyBee®

F405 V3 BLS 50A 30x30 Stack

User Manual V1.0

Part 1 - OverView

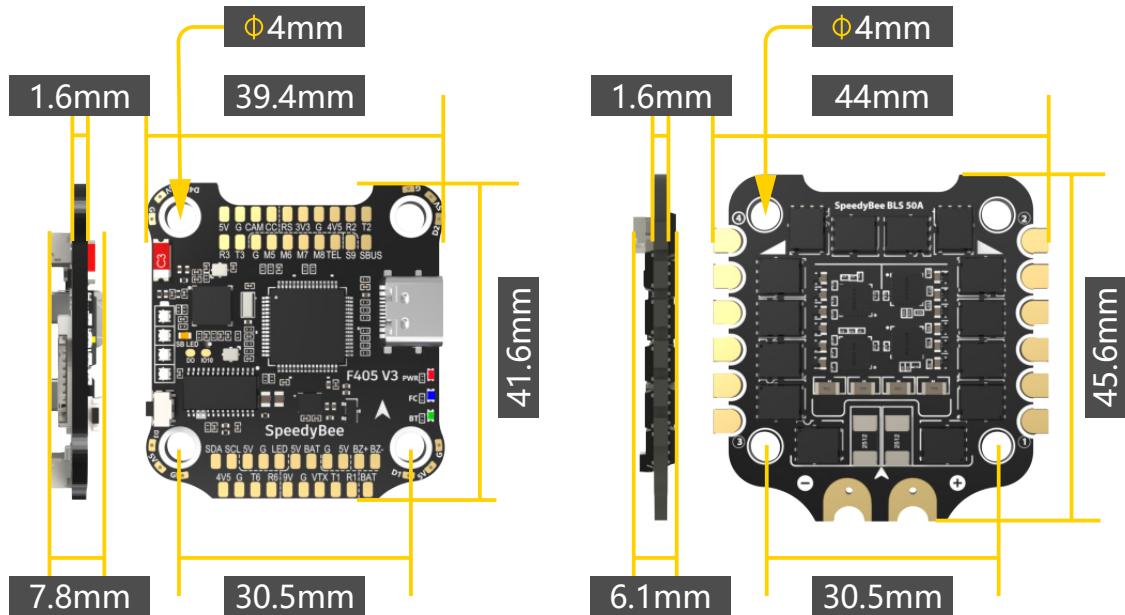
Specs Overview

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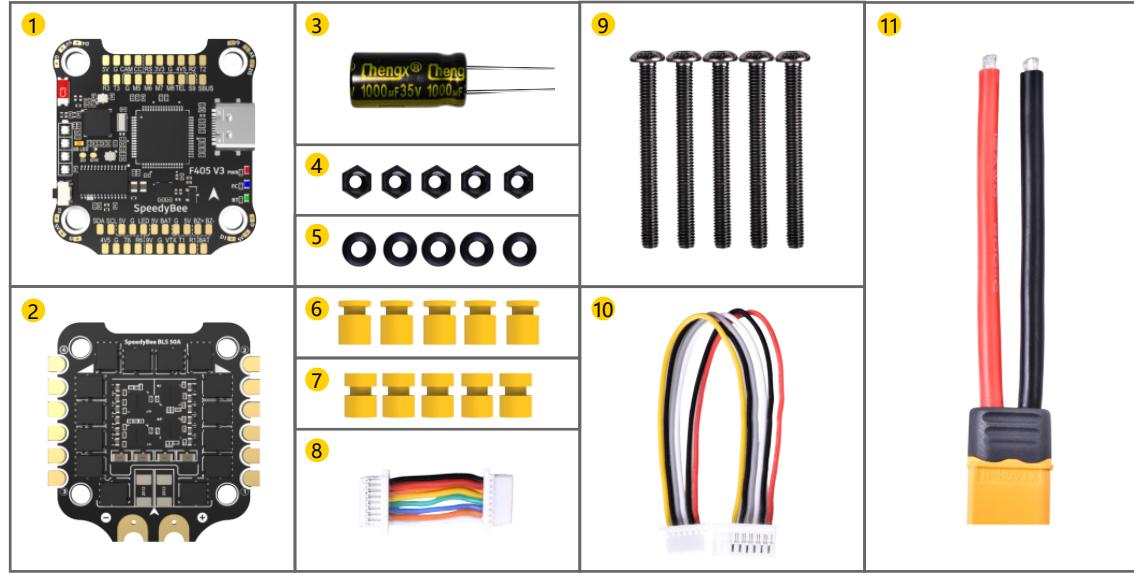
Product Name	SpeedyBee F405 V3 BLS 50A 30x30 Stack
Flight Controller	SpeedyBee F405 V3
ESC	SpeedyBee BLS 50A 4-in-1 ESC
Bluetooth	Supported. For FC & ESC parameter settings
Wireless FC Firmware Flashing	NOT Supported
Wireless Blackbox Dwonload & Analysis	NOT Supported
Power Input	3-6S LiPo
Mounting	30.5 x 30.5mm (4mm hole size)
Dimension	45.6mm(L) x 44mm(W) x 18.3mm(H)
Weight	23.4g

Dimensions

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Option 1 - SpeedyBee F405 V3 50A 30x30 Stack



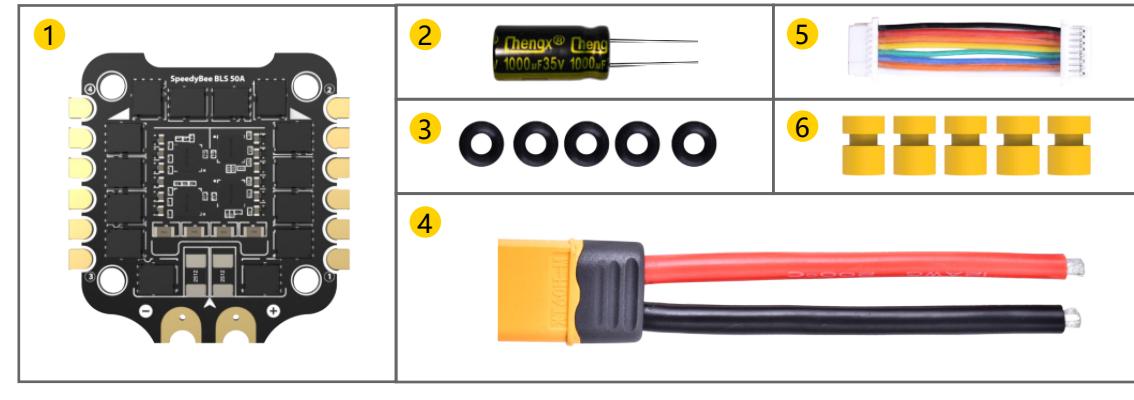
- 1 SpeedyBee F405 V3 Flight Controller x 1
- 2 SpeedyBee BLS 50A 4-in-1 ESC x 1
- 3 35V 1000uF Low ESR Capacitor x 1
- 4 M3 Nylon Nut x 5
- 5 M3 silicone O Ring x 5
- 6 M3*8mm Silicone Grommets(for FC) x 5
- 7 M3*8.1mm Silicone Grommets(for ESC) x 5
- 8 SH 1.0mm 15mm-length 8pin Cable(for FC-ESC connection) x 1
- 9 M3*30mm Iner-hexagon Screws x 5
- 10 DJI 6pin Cable(80mm) x 1
- 11 XT60 Power Cable(70mm) x 1

Option 2 - SpeedyBee F405 V3 Flight Controller



- 1 SpeedyBee F405 V3 Flight Controller x 1
- 2 M3*8mm Silicone Grommets(for FC) x 5
- 3 SH 1.0mm 30mm-length 8pin Cable(for FC-ESC connection) x 1
- 4 DJI 6pin Cable(80mm) x 1

Option 3 - SpeedyBee BLS 50A 4-in-1 ESC

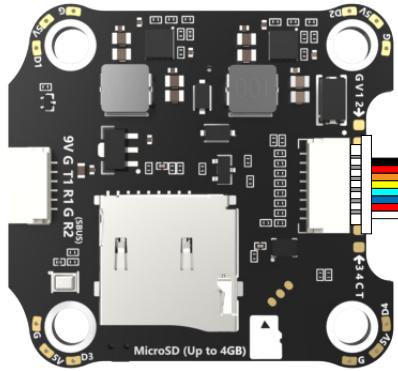


- 1 SpeedyBee BLS 50A 4-in-1 ESC x 1
- 2 35V 1000uF Low ESR Capacitor x 1
- 3 M3 silicone O Ring x 5
- 4 XT60 Power Cable(70mm) x 1
- 5 SH 1.0mm 30mm-length 8pin Cable(for FC-ESC connection) x 1
- 6 M3*8.1mm Silicone Grommets(for ESC) x 5

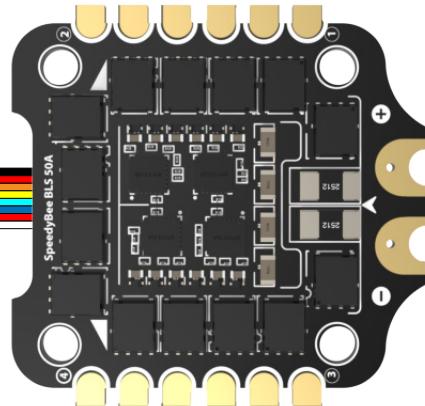
Use the 8-pin cable in the package to connect the FC and the ESC.
Or solder 8 wires directly to the 8 pads on each end.

Method 1 - Using 8-pin cable

Use any end of the 8-pin JST cable to connect the FC to the ESC.



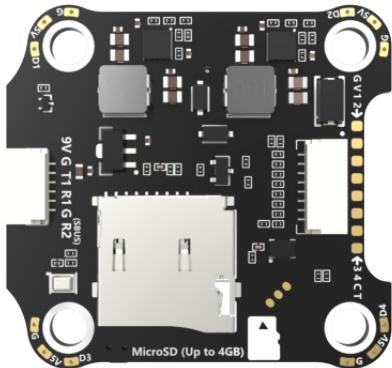
F7 V3 Flight Controller



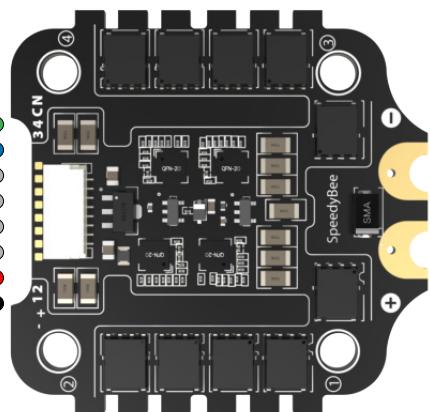
BLS 50A 4-in-1 ESC

Method 2 - Direct soldering

Solder 8 wires to the 8 pads on each end referring to the pad definition below.



F405 V3 Flight Controller

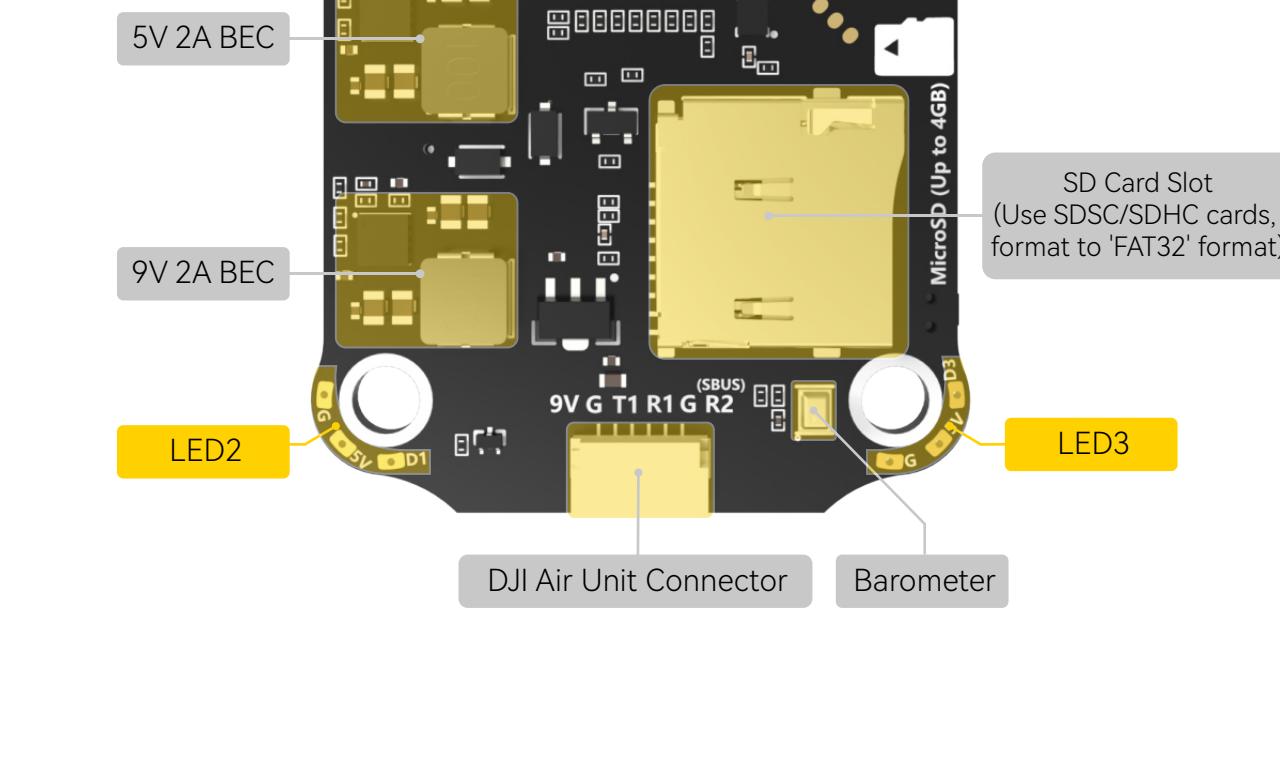
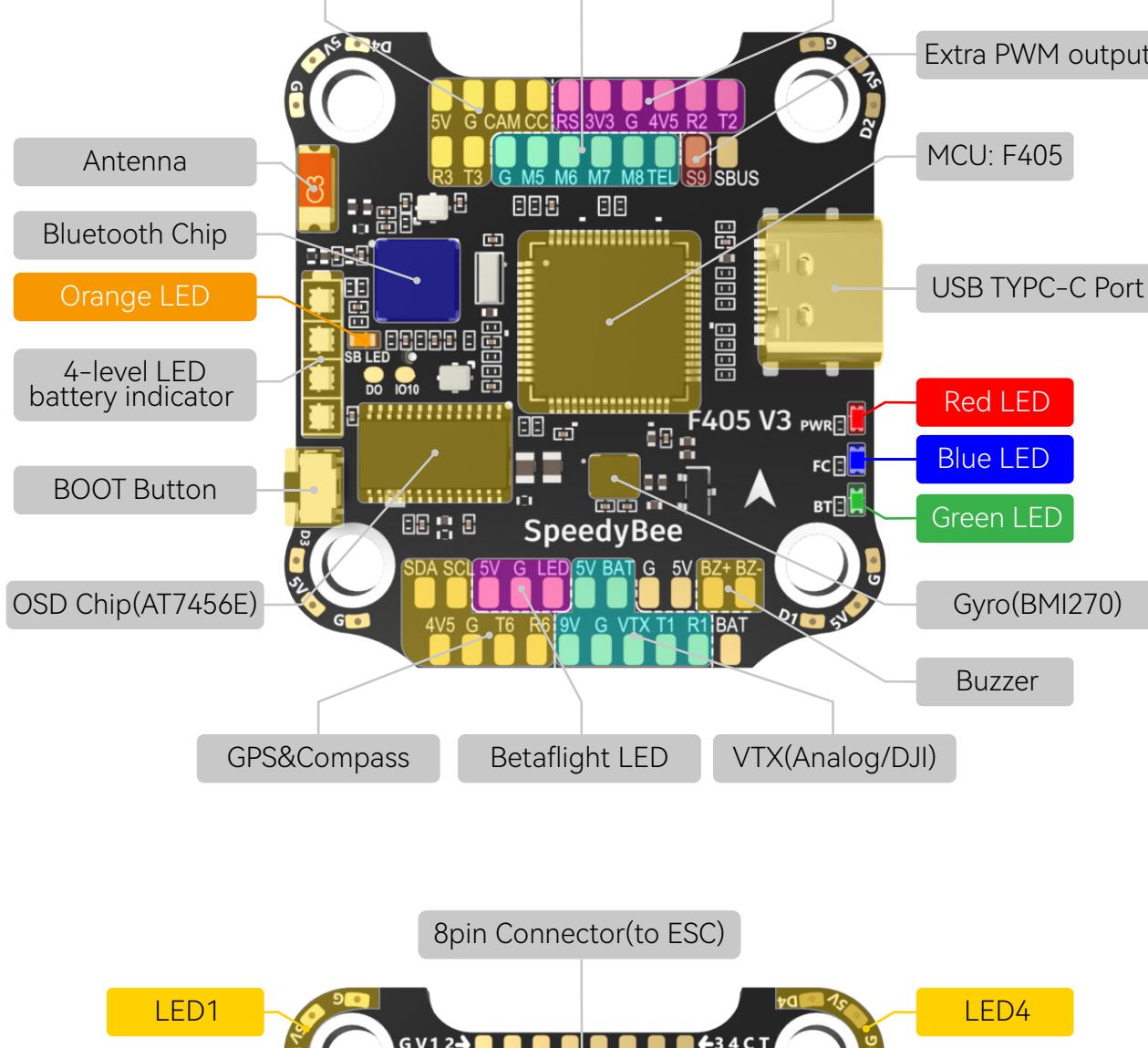


BLS 50A 4-in-1 ESC

Part 2 - F405 V3 Flight Controller

Layout

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■ LED Indicator Definition

■ **RED LED** - Power Indicator. **Solid Red** after powering up.

■ **GREEN LED** - Bluetooth status light. **Solid Green** indicates Bluetooth is connected.

■ **BLUE LED** - Flight controller status light which is controlled by the flight controller firmware.

■ **Orange LED** - LED Control Mode Indicator. It indicates the 4 sets of LED strips connected to LED1-LED4 pads on the corners of the flight controller are controlled by Betaflight firmware(BF_LED mode) or the Bluetooth chip(SB_LED mode).

Solid Orange : indicates the 4 x LEDs are in SB_LED mode. In this mode, when the FC is powered on and in standby mode, press the BOOT button to cycle the display modes of the LEDs. You could also change modes in the app wirelessly.

OFF : indicates the 4 x LEDs are controlled by Betaflight firmware.

Long press the button for 3 seconds to switch the control modes between BF_LED mode and SB_LED mode.

■ BOOT Button

[A] Only if the flight controller gets bricked and can't power up, please follow these steps to re-flash firmware for it:

① Insert a USB A to TYPE-C cable to your PC.

② Press and hold the BOOT button, insert the USB cable into the flight controller, then release the BOOT button.

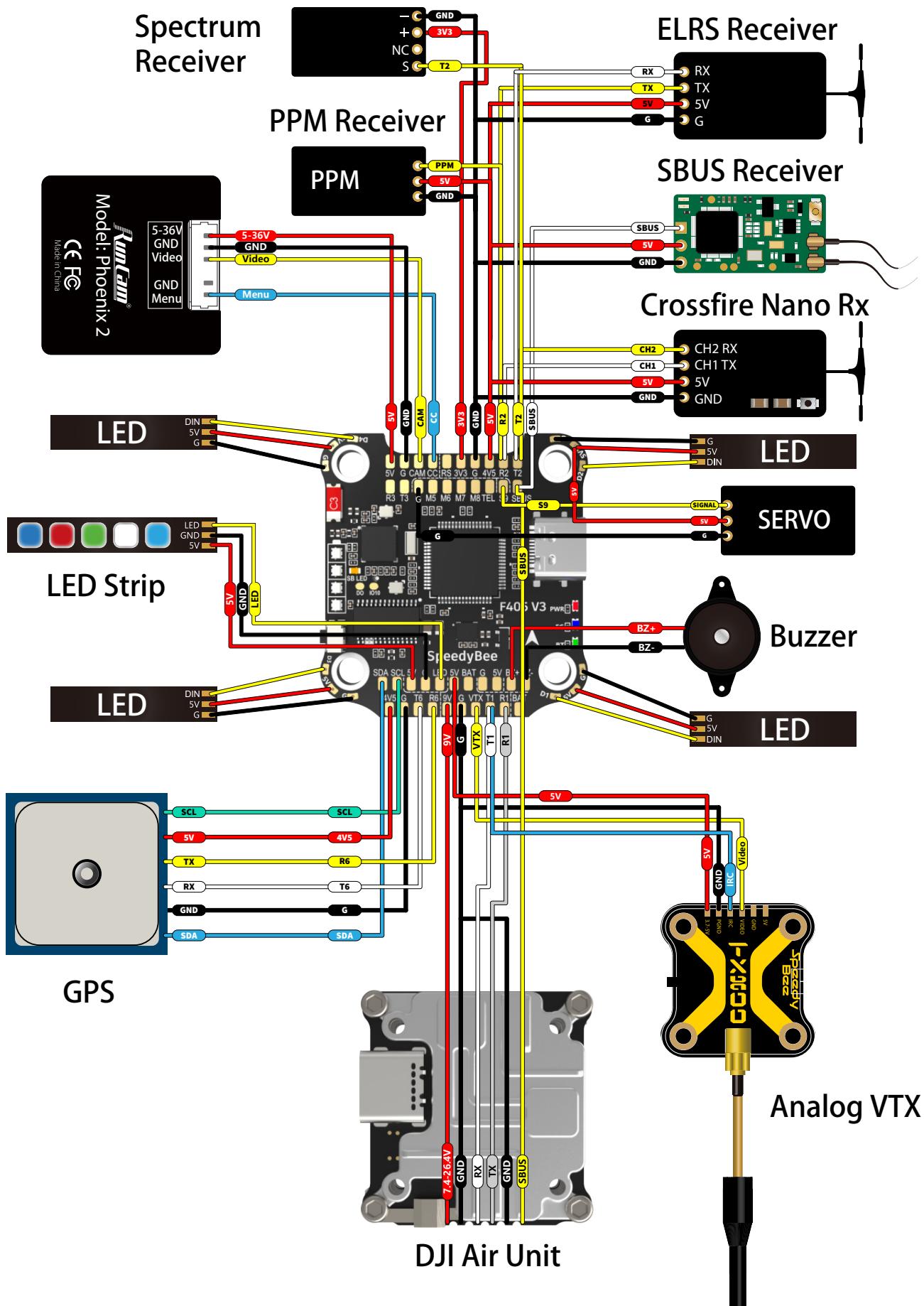
③ Open Betaflight/INAV configurator on the PC, go to the 'Firmware Flashing' page, choose the target 'SPEEDYBEEF405V3' and flash.

[B]. When the FC is powered on and in standby mode, the BOOT button can be used to control the LED strips connected to LED1-LED4 pads on the corners. By default, short-press the BOOT button to cycle the LED displaying mode. Long-press the BOOT button to switch between SpeedyBEE-LED mode and BF-LED mode.

Under BF-LED mode, all the LED1-LED4 strips will be controlled by the Betaflight firmware.

FC's Peripheral Connection

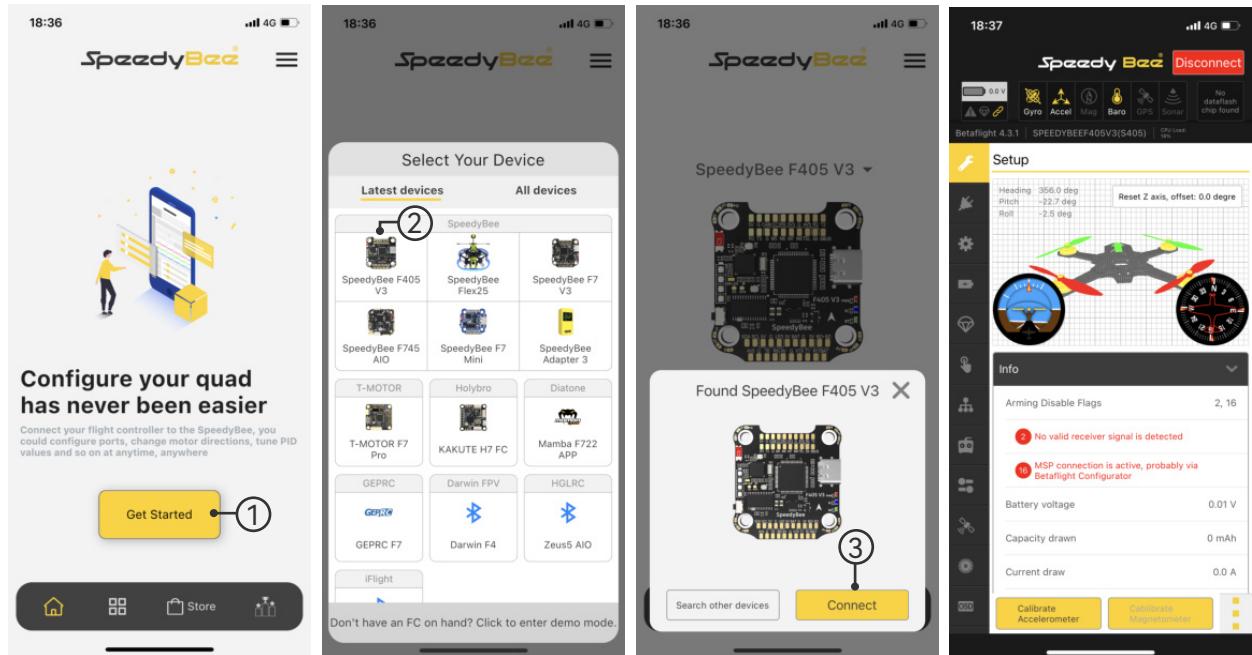
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■ Get the SpeedyBee App

Search 'SpeedyBee' on Google Play or App Store. Or download the Android .apk file on our website: <https://www.speedybee.com/download>.

■ FC Configuration

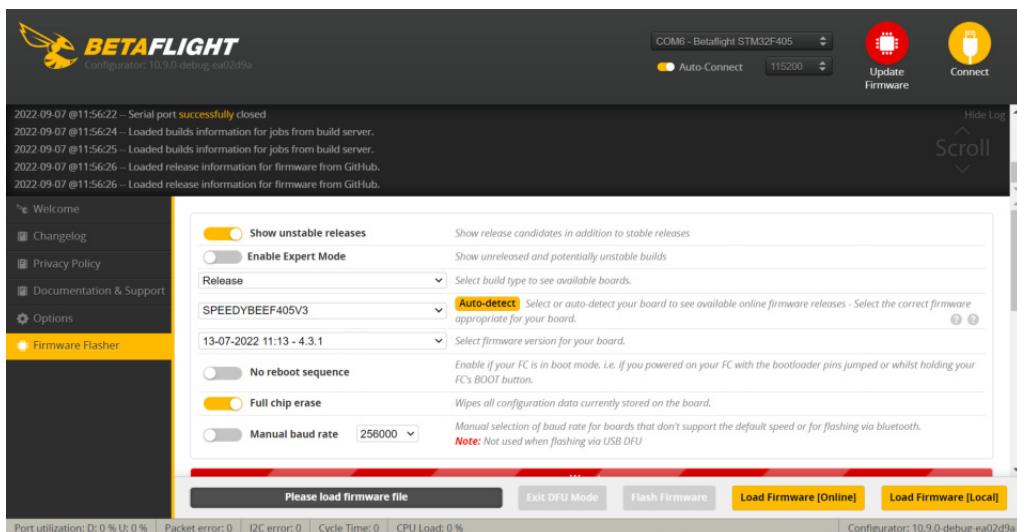


FC Firmware Update

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SpeedyBee F405 V3 flight controller does not support wireless firmware flashing, so please flash firmware for it on your PC following the steps below:

- ① Connect the flight controller to the PC with a USB cable
- ② Open Betaflight/INAV configurator on your PC. Take Betaflight configurator as an example, go to the 'Firmware Flashing' page, choose the target '**SPEEDYBEEF405V3**' and flash.



Specifications

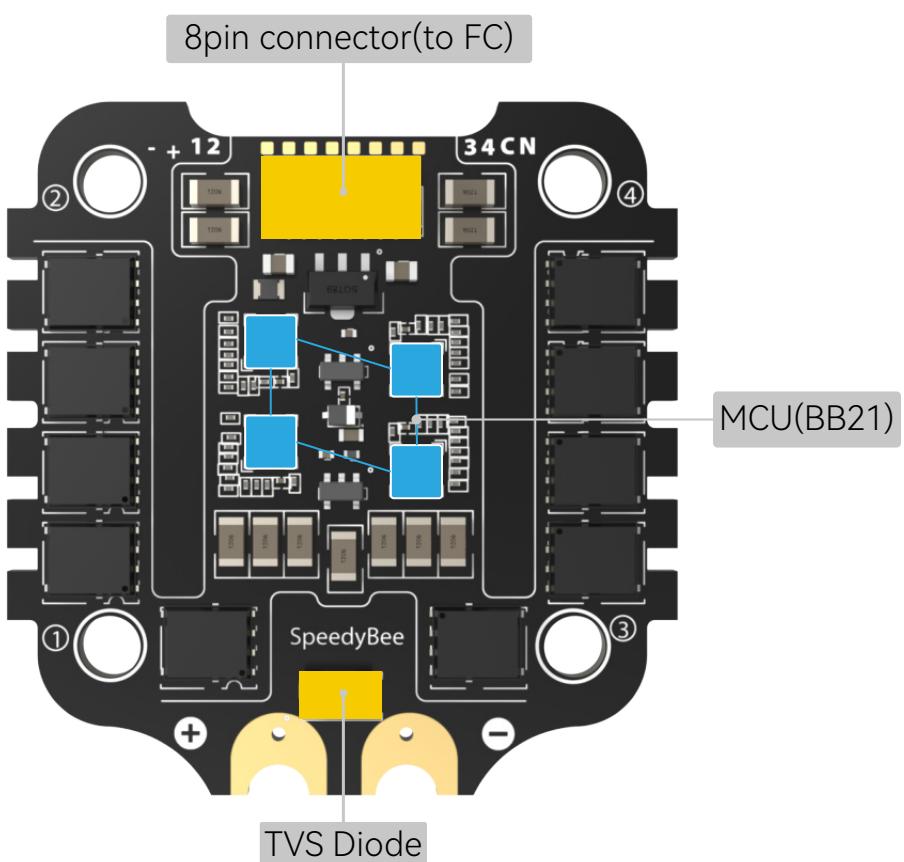
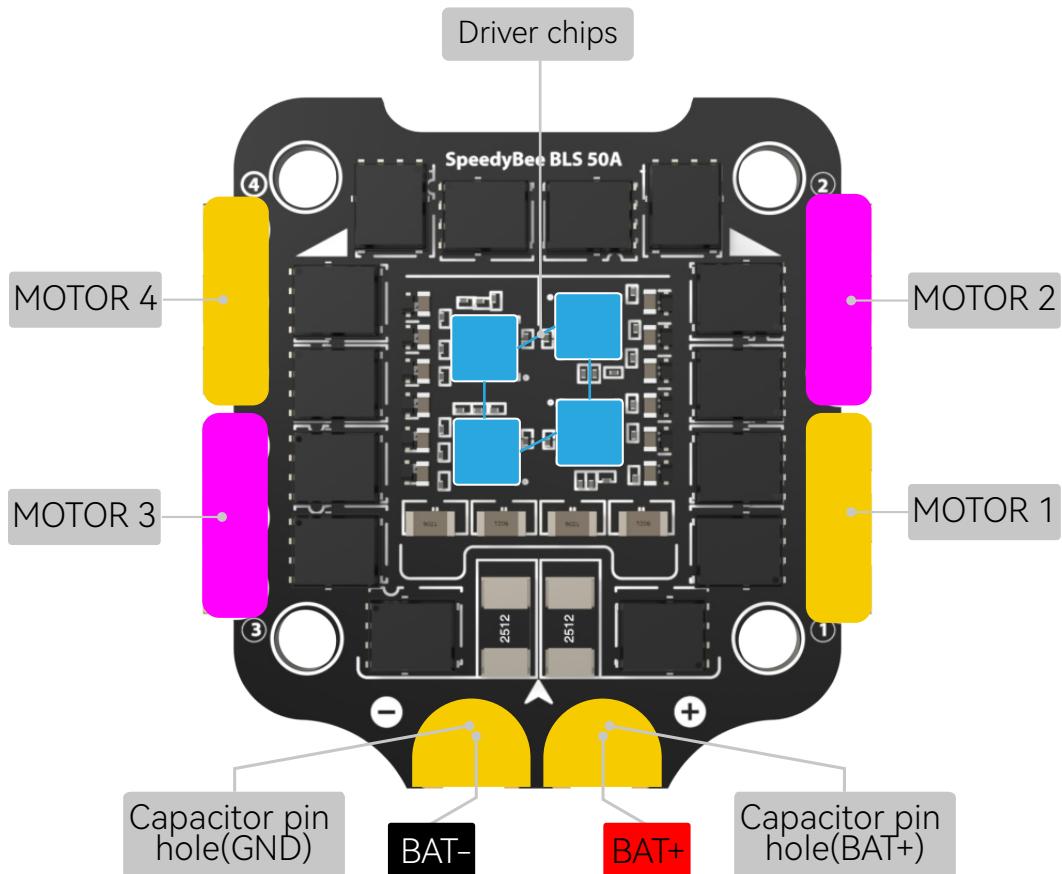
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Product Name	SpeedyBee F405 V3 30x30 Flight Controller
MCU	STM32F405
IMU(Gyro)	BMI270
USB Port Type	Type-C
Barometer	Built-in
OSD Chip	AT7456E chip
BLE Bluetooth	Supported. Used for Flight Controller configuration (MSP should be enabled with Baud rate 115200 on UART 4)
DJI Air Unit Connection Way	Two ways supported: 6-pin connector or direct soldering.
6-pin DJI Air Unit Plug	Supported. Completely compatible with DJI O3/RunCam Link/Caddx Vista/DJI Air Unit V1, no wire is needed to be changed.
Blackbox MicroSD Card Slot	Supported. Please use ≤4GB SDSC/SDHC microSD card and should be formatted to FAT16/FAT32 format. Don't use SDXC cards. Note: Betaflight can only recognize 4GB max.
BetaFlight Camera Control Pad	Yes(CC pad on the front side)
Current Sensor Input	Supported. For SpeedyBee BLS 50A ESC, please set scale = 386 and Offset = 0.
Power Input	3S - 6S Lipo(Through G, BAT pins/pads from the 8-pin connector or 8-pads on the bottom side)
5V Output	9 groups of 5V output, four +5V pads and 1 BZ+ pad(used for Buzzer) on front side, and 4x LED 5V pads. The total current load is 2A.
9V Output	2 groups of 9V output, one +9V pad on front side and other included in a connector on bottom side. The total current load is 2A.
3.3V Output	Supported. Designed for 3.3V-input receivers. Up to 500mA current load.
4.5V Output	Supported. Designed for receiver and GPS module even when the FC is powered through the USB port. Up to 1A current load.
ESC Signal	M1 - M4 on bottom side and M5-M8 on front side.
UART	6 sets(UART1, UART2, UART3, UART4(Dedicated for Bluetooth connection), UART5(Dedicated for ESC telemetry), UART6)
ESC Telemetry	UART R5(UART5)
I2C	Supported. SDA & SCL pads on front side. Used for magnetometer, sonar, etc.
Traditional Betaflight LED Pad	Supported. 5V, G and LED pads on bottom of the front side. Used for WS2812 LED controlled by Betaflight firmware.
Buzzer	BZ+ and BZ- pad used for 5V Buzzer
BOOT Button	Supported. [A]. Press and hold BOOT button and power the FC on at the same time will force the FC to enter DFU mode, this is for firmware flashing when the FC gets bricked. [B]. When the FC is powered on and in standby mode, the BOOT button can be used to controller the LED strips connected to LED1-LED4 connectors on the bottom side. By default, short-press the BOOT button to cycle the LED displaying mode. Long-press the BOOT button to switch between SpeedyBee-LED mode and BF-LED mode. Under BF-LED mode, all the LED1-LED4 strips will be controlled by Betaflight firmware.
RSSI Input	Supported. Named as RS on the front side.
Smart Port / F.Port	Not supported
Supported Flight Controller Firmware	BetaFlight(Default), INAV
Firmware Target Name	SPEEDYBEEF405V3
Mounting	30.5 x 30.5mm(4mm hole diameter)
Dimension	41.6(L) x 39.4(W) x 7.8(H)mm
Weight	9.6g

Part 3 - SpeedyBee BLS 50A 4-in-1 ESC

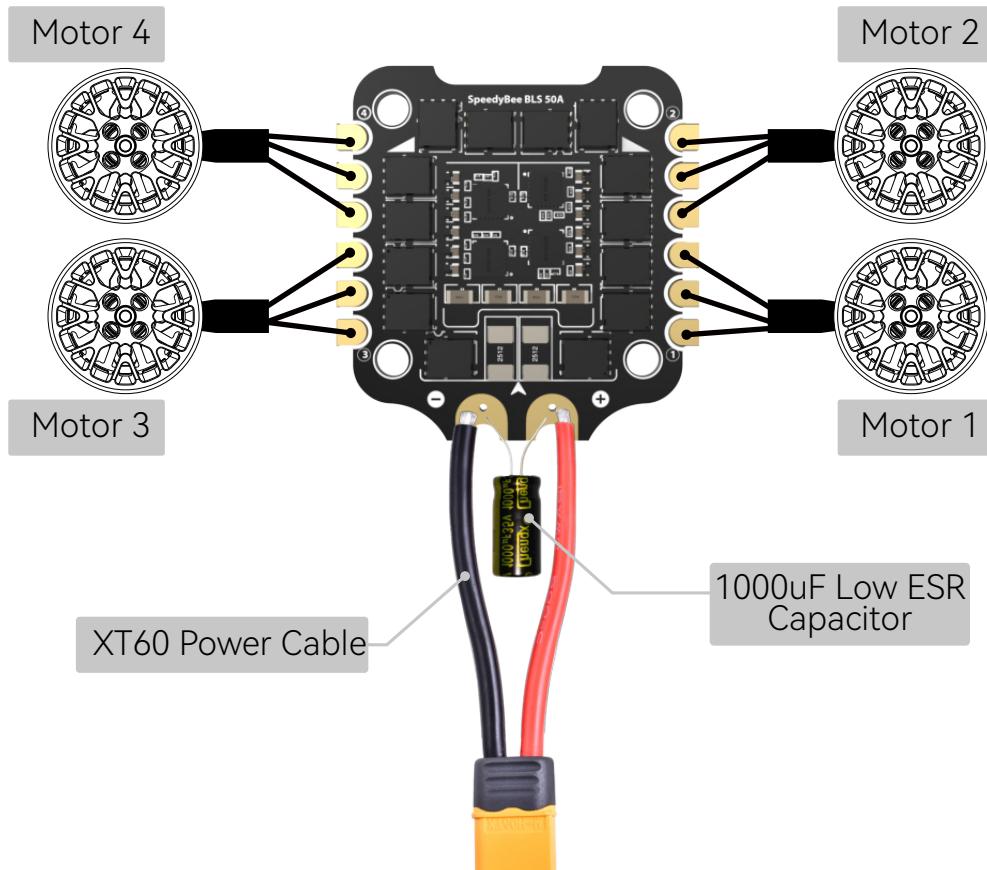
Layout

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Connection with Motors & Power Cable

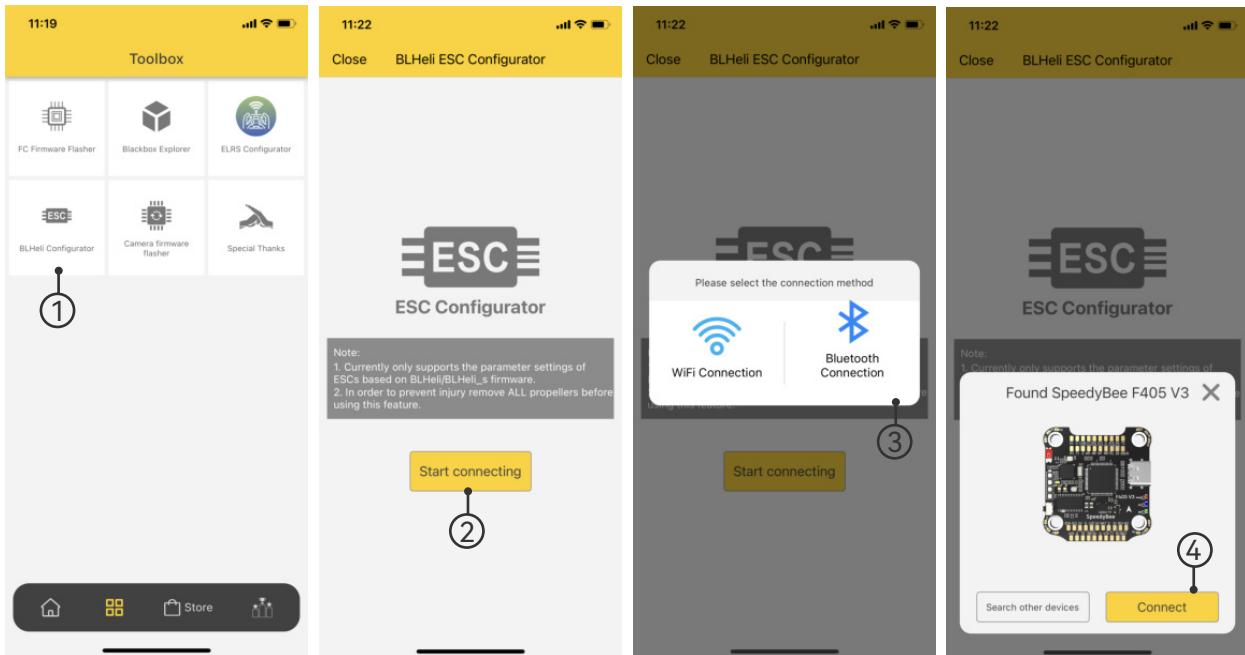
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- **Note:** In order to prevent the stack from being burnt out by voltage spikes on powering up, it is strongly recommended to use the Low ESR capacitor in the package.

ESC Configuration

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■ If you'd like to use a PC configurator, we recommend the [ESC Configurator](#).

- You could flash both BLHeli_S and Blue Jay firmware for this ESC.

You need to plug in the battery to the F405 V3 and then connect a USB cable between the F405 V3 and your PC. Then flash ESC firmware (BLHeli_S or Blue Jay) in the following online configurator:

<https://esc-configurator.com/>

Note: ESC Type should be set as 'J-H-50'.

2022-07-29 @ 15:24:11 -- Chrome (103.0.0.0) on Windows

Welcome to ESC - Configurator, a utility designed to simplify updating and configuring of your ESCs.

This tool is considered BETA.

Things might not work as expected yet - if you find any bugs please report them. For known browser issues please check the wiki.

Disclaimer
The web application supports ESCs running BLHeli for Atmel, BLHeli for SiLabs and BLHeli_S.

BLHeli FC passthrough is the only interface currently supported.

Should you run into any problems, make sure to use the Save Debug Log button and submit a new issue via GitHub.

Application source code can be downloaded from here.

Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

Join us on Discord!
If you have any questions or need a quick helping hand, join us on our Discord server: [86 online](#)

For our Chinese visitors
Tell your friends behind the great firewall of China, that they

2022-07-29 @ 15:24:11 -- esc-configurator.com wants to connect to a serial port

STM32 Virtual ComPort in FS Mode (COM4) - Paired

Welcome to ESC - Configurator, a utility designed to simplify updating and configuring of your ESCs.

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Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

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For our Chinese visitors
Tell your friends behind the great firewall of China, that they

2022-07-29 @ 15:23:54 -- Port selected

Welcome to ESC - Configurator, a utility designed to simplify updating and configuring of your ESCs.

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Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

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For our Chinese visitors
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2022-07-29 @ 15:24:27 -- Unique device ID received - 0x04300423039510c35383236

Note: Make sure you've taken the propellers OFF before doing anything on this tab.
Note: Connect power to the ESCs.

Motor Control
Make sure your ESCs are properly set up to reflect the state of the sliders.
Eg: When you enabled 3D mode in your flight controller, make sure the ESCs are also set up for 3D mode, otherwise the motors might go off with full power.
Also be aware that the motors will not spin if you have bi-directional Dshot enabled on the Flight-controller, but the ESC does not support it. Which might be the case when flashing from RPM enabled firmware to BLHeli_S.
 Enable motor control
Battery: 28 @ 7.16V
Master Speed 1000
Motor 1 1000
Motor 2 1000

Save Debug Log **Clear Debug Log** **Restore Default Settings** **Flash All ESCs** **Write Settings** **Read Settings**

Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

2022-07-29 @ 15:24:41 -- Done reading ESCs

Note: Make sure you've taken the propellers OFF before doing anything on this tab.
Note: Connect power to the ESCs.

Common Parameters
 Programming by TX
0.50 Startup Power ?
140 C Temperature Protection ?
 Low RPM Power Protection
 Brake on stop ?
Low Demag Compensation ?
Medium Motor Timing ?
40 Beep Strength ?

ESC 1: J-H-45 - BLHeli_S, 16.7
Reversed
1148 µs PPM Min Throttle
1832 µs PPM Max Throttle
Off LED Configuration
Flash Firmware to this ESC

ESC 2: J-H-45 - BLHeli_S, 16.7
Reversed
Motor Direction ?

Select Target (J-H-40 - BLHeli_S, 16.7)
BLHeli_S Firmware
J-H-45 ESC
16.7 [Official] Version
Flash
Flash Local Firmware
Cancel

Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

2022-07-29 @ 15:24:41 -- Done reading ESCs

Ignore inappropriate MCU and Layout?
 Migrate settings between different firmwares?

Note: Be aware that settings are not migrated between different firmwares, make sure to take note of your motor directions and other settings you might want to move over. Settings will be migrated between different versions of the same firmware.

Select Target (J-H-40 - BLHeli_S, 16.7)
BLHeli_S Firmware
J-H-45 ESC
16.7 [Official] Version
Flash
Flash Local Firmware
Cancel

Port utilization: D: 0% U: 0% | Packet error: 0 | v0.24.0

Specifications

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Product Name	SpeedyBee BLS 50A 30x30 4-in-1 ESC
Firmware	BLHeli_S JH50
Wireless Configuration	Full Configuration Supported in the SpeedyBee app
PC Configurator Download Link	https://esc-configurator.com/
Continuous Current	50A * 4
Burst Current	55A(5S)
TVS Protective diode	Yes
External Capacitor	1000uF Low ESR Capacitor(In the package)
ESC Protocol	DSHOT300/600
Power Input	3-6S LiPo
Power Output	VBAT
Current Sensor	Support (Scale=386 Offset=0)
Mounting	30.5 x 30.5mm(4mm hole diameter)
Dimension	45.6(L) * 44(W) * 6.1mm(H)
Weight	13.8g