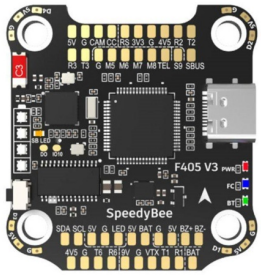

SpeedyBee F405 V3 Flight Controller User Manual

Stack F405 V3
30×30 BLS 50A
F405 V3 BLS 50A 30×30 Stack
User Manual V1.0

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1 OverView
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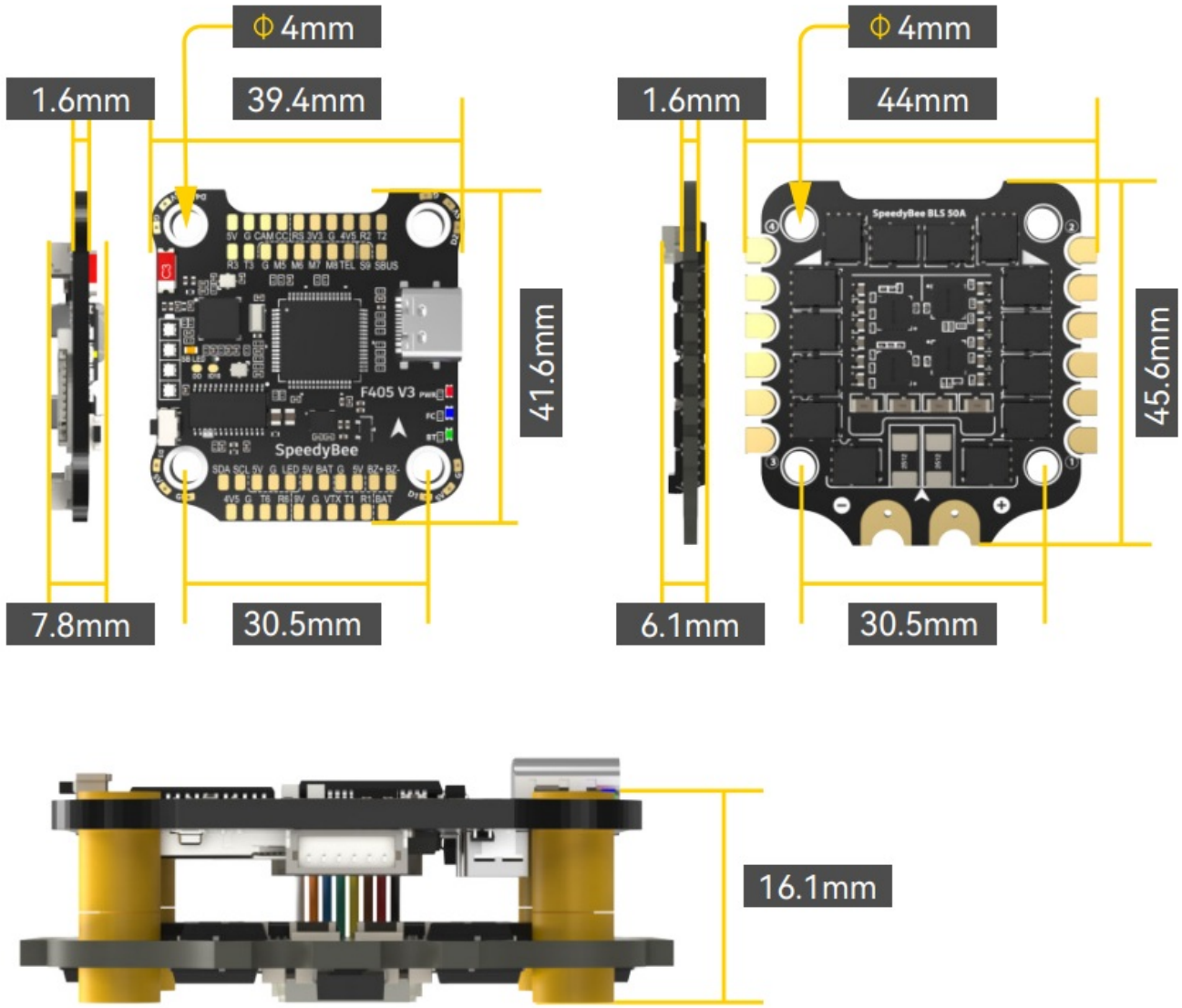
OverView

Specs Overview

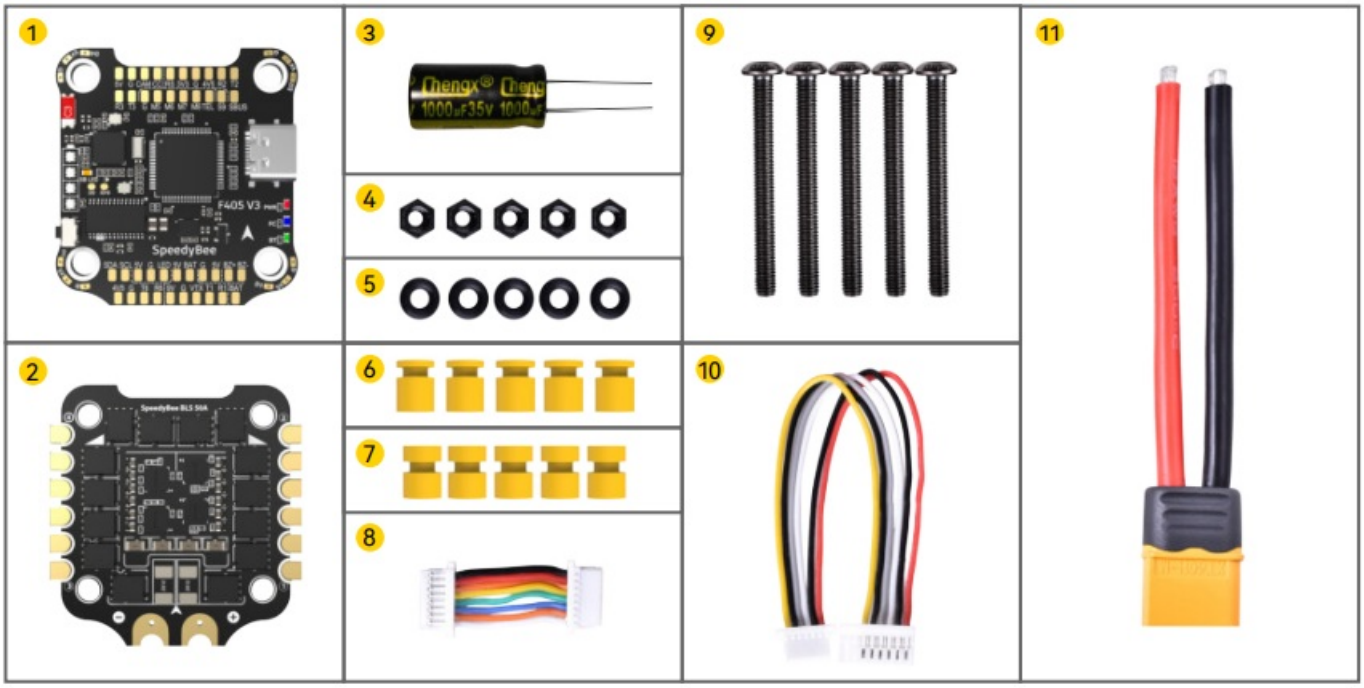
Product Name	SpeedyBee F405 V3 BLS 50A 30×30 Stack
Right Controller	SpeedyBee F405 V3
ESC	SpeedyBee BLS 50A 4-in-1 ESC
Bluetooth	Supported. For FC & ESC parameter settings
Wireless FC Firmware Flashing	NOT Supported
Wireless Blackbox Dwonload & Analysis	NOT Supported
Power Input	3-65 LiPo
Mounting	30.5 x 30.5mm (4mm hole size)
Dimension	45.6mm(L) x 44mm(W) x 18.3mm(H)
Weight	23.4g

Dimensions



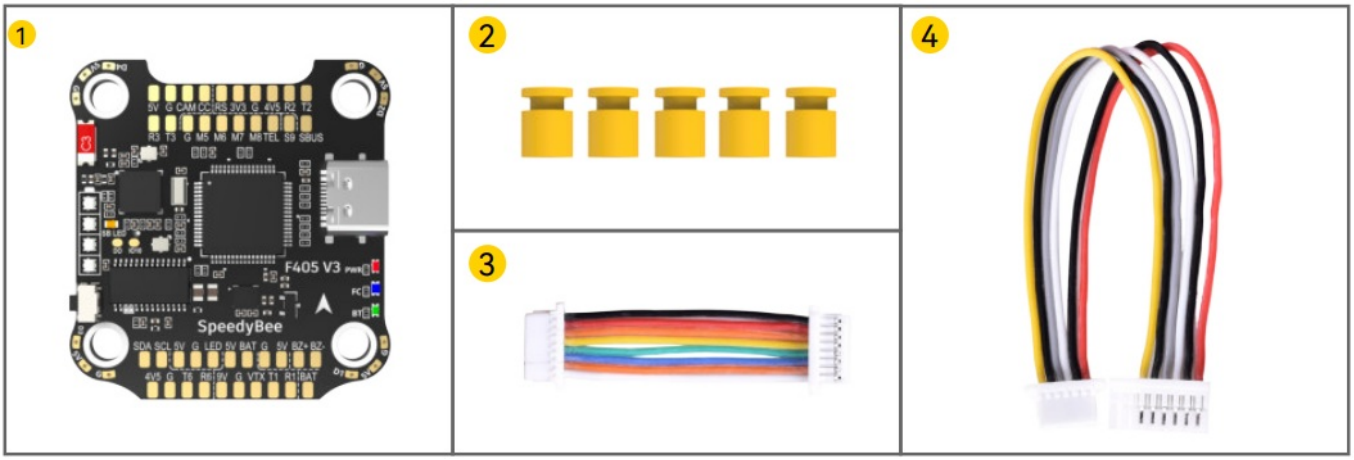
Package

Option 1 – SpeedyBee F405 V3 50A 30×30 Stack



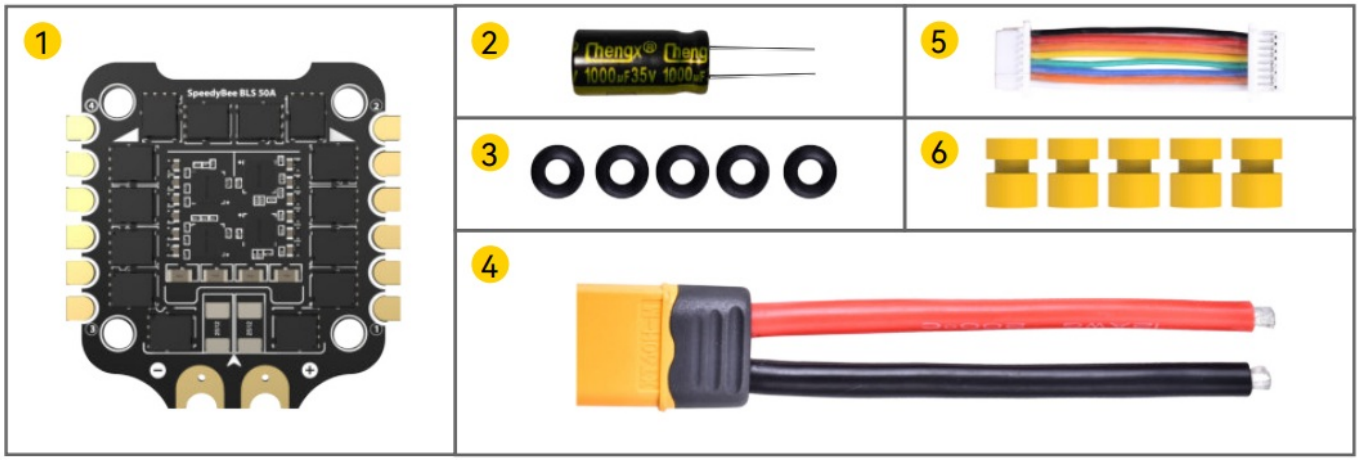
1. SpeedyBee F405 V3 Flight Controller x 1
2. SpeedyBee BLS 50A 4-in-1 ESC x 1
3. 35V 1000uF Low ESR Capacitor x 1
4. M3 Nylon Nut x 5
5. M3 silicone O Ring x 5
6. M3*8mm Silicone Grommets(for FC) x 5
7. M3*8.1mm Silicone Grommets(for ESC) x 5
8. SH 1.0mm 15mm-length 8pin Cable(for FC-ESC connection) 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

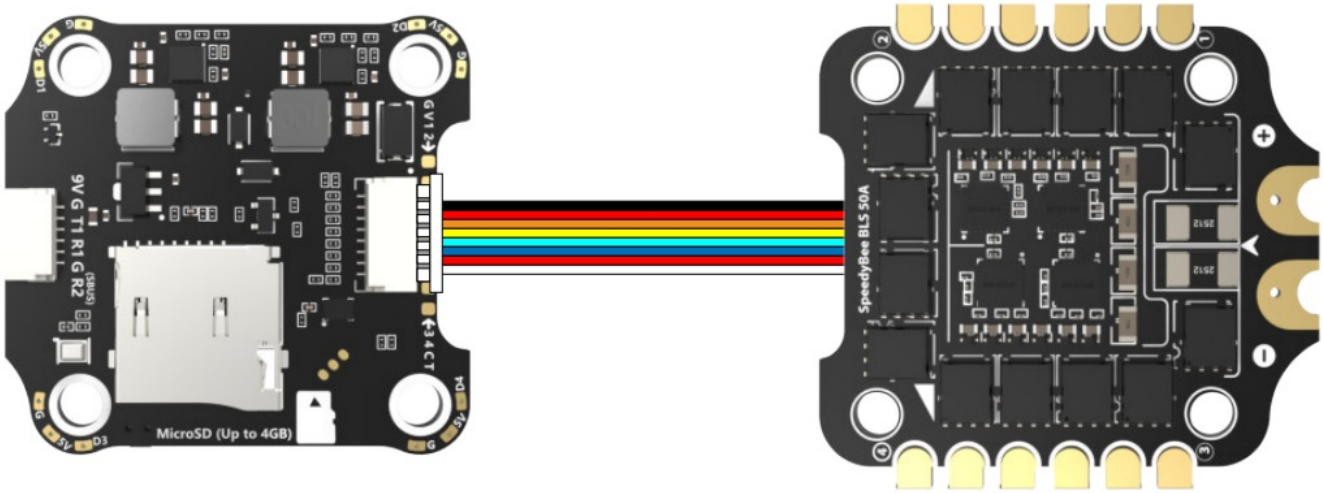
3. SH 1.0mm 30mm-length 8pin Cable(for FC-ESC connection) x 1
4. DJI 6pin Cable(80mm) x 1



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

FC & ESC Connection

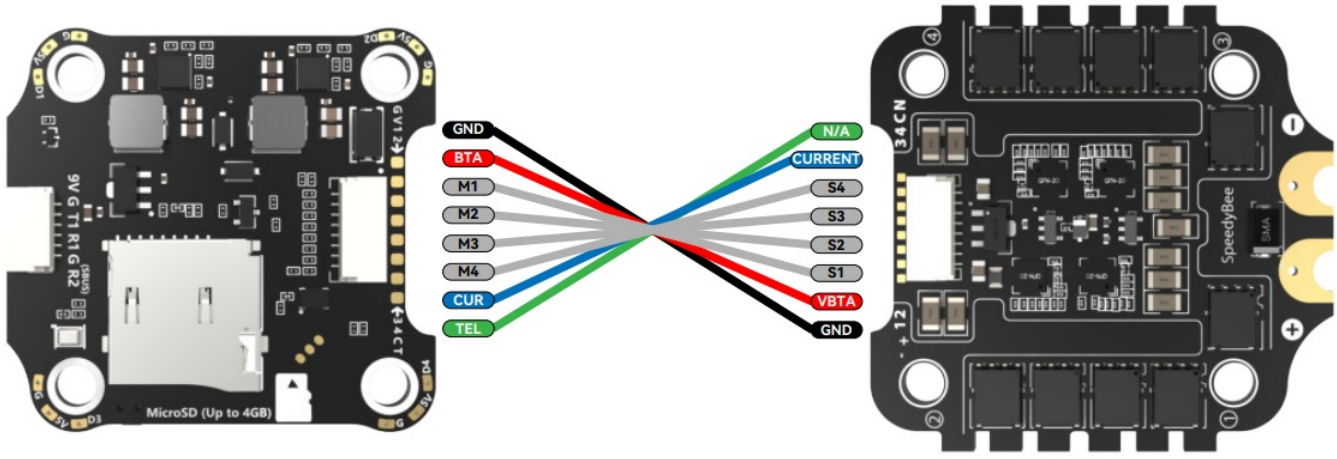
Use the 8-pin cable in the package to connect the FC and the ESC.
Or solder 8 wires directly to the 8 pads on each end.
Method 1 – Using 8-pin cable
Use any end of the 8-pin JST cable to connect the FC to the ESC.



F7 V3 Flight Controller

BLS 50A 4-in-1 ESC

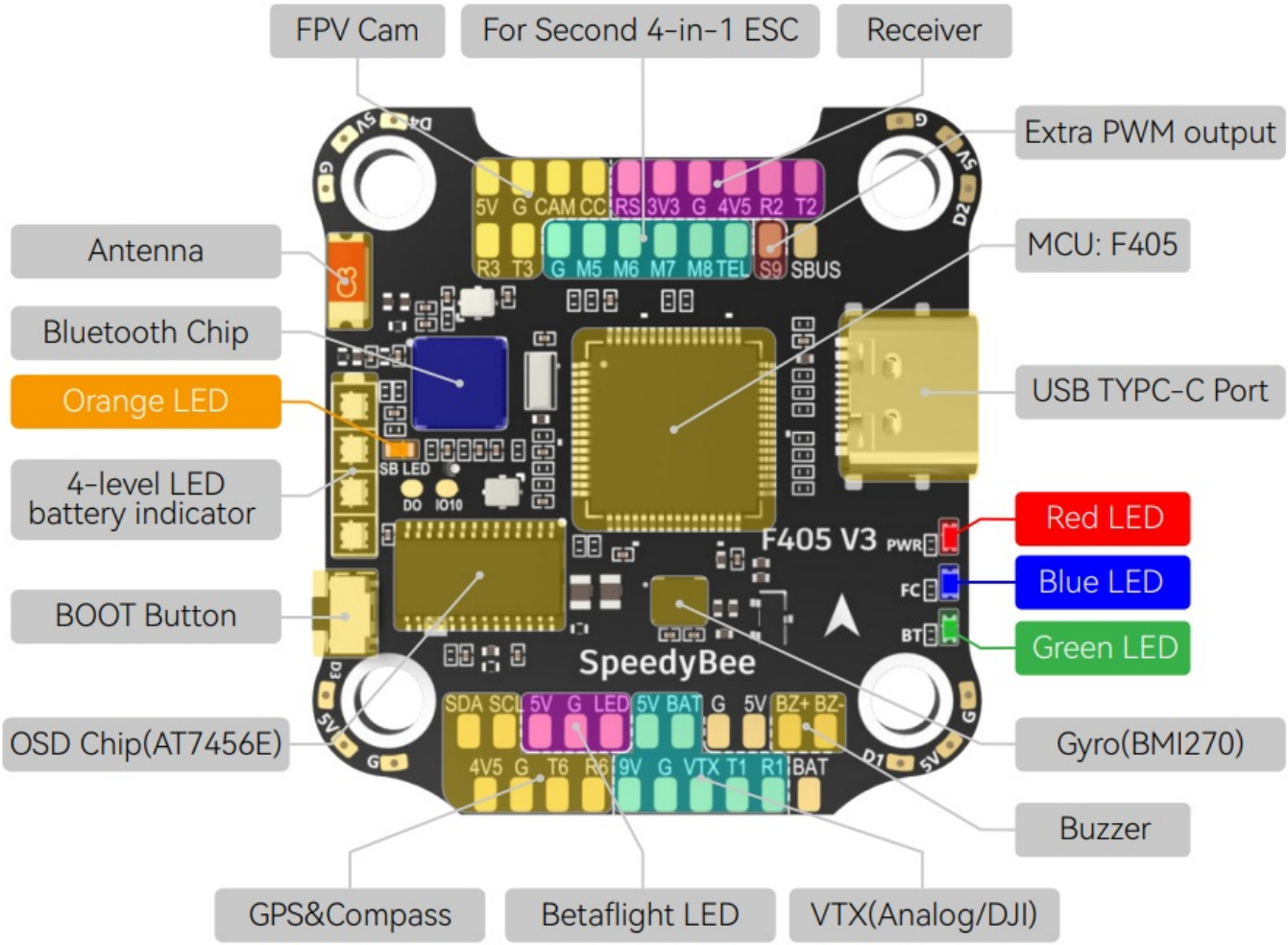
Method 2 – Direct soldering
Solder 8 wires to the 8 pads on each end referring to the pad definition below.

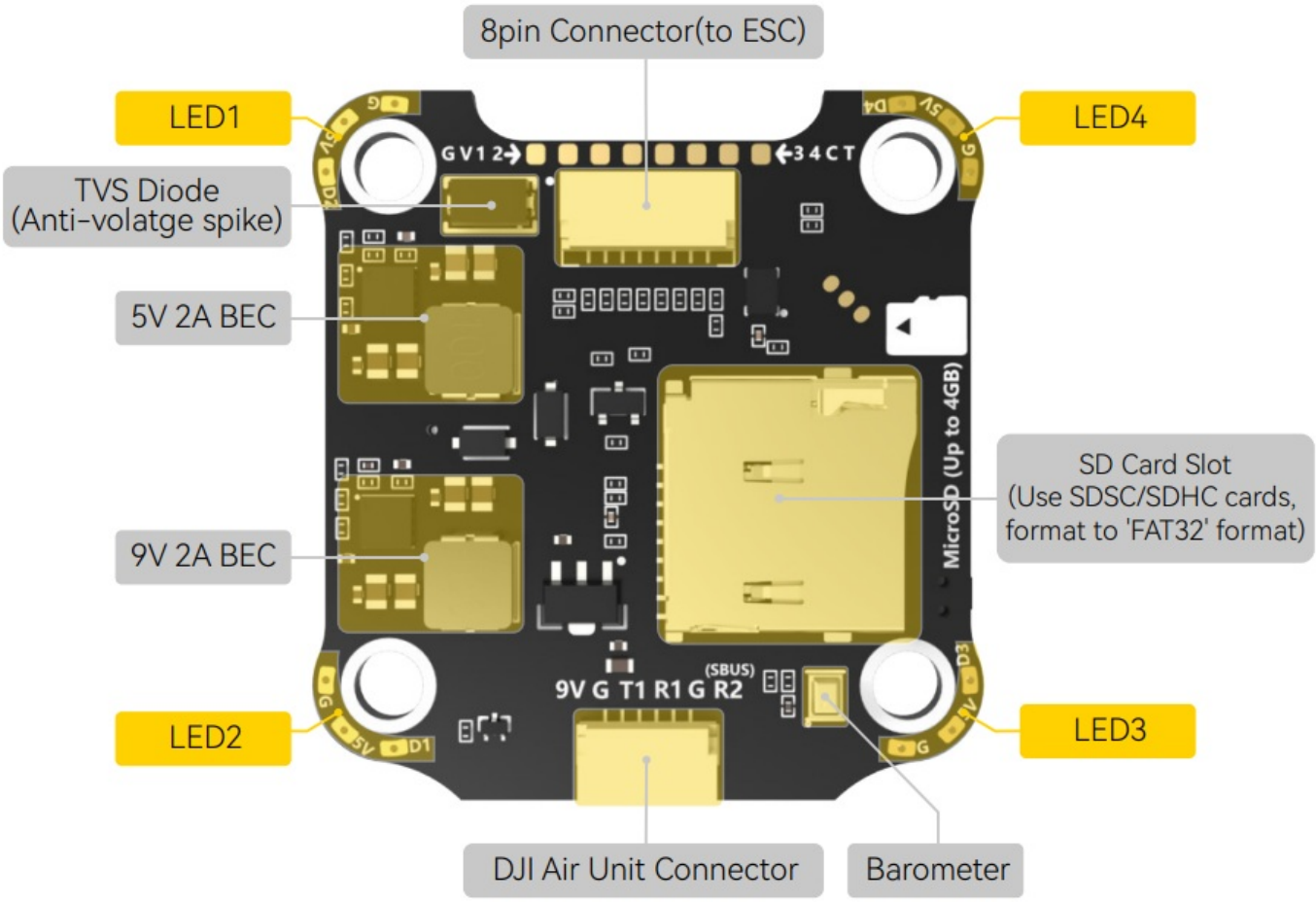


F405 V3 Flight Controller BLS 50A 4-in-1 ESC

F405 V3 Flight Controller

Layout

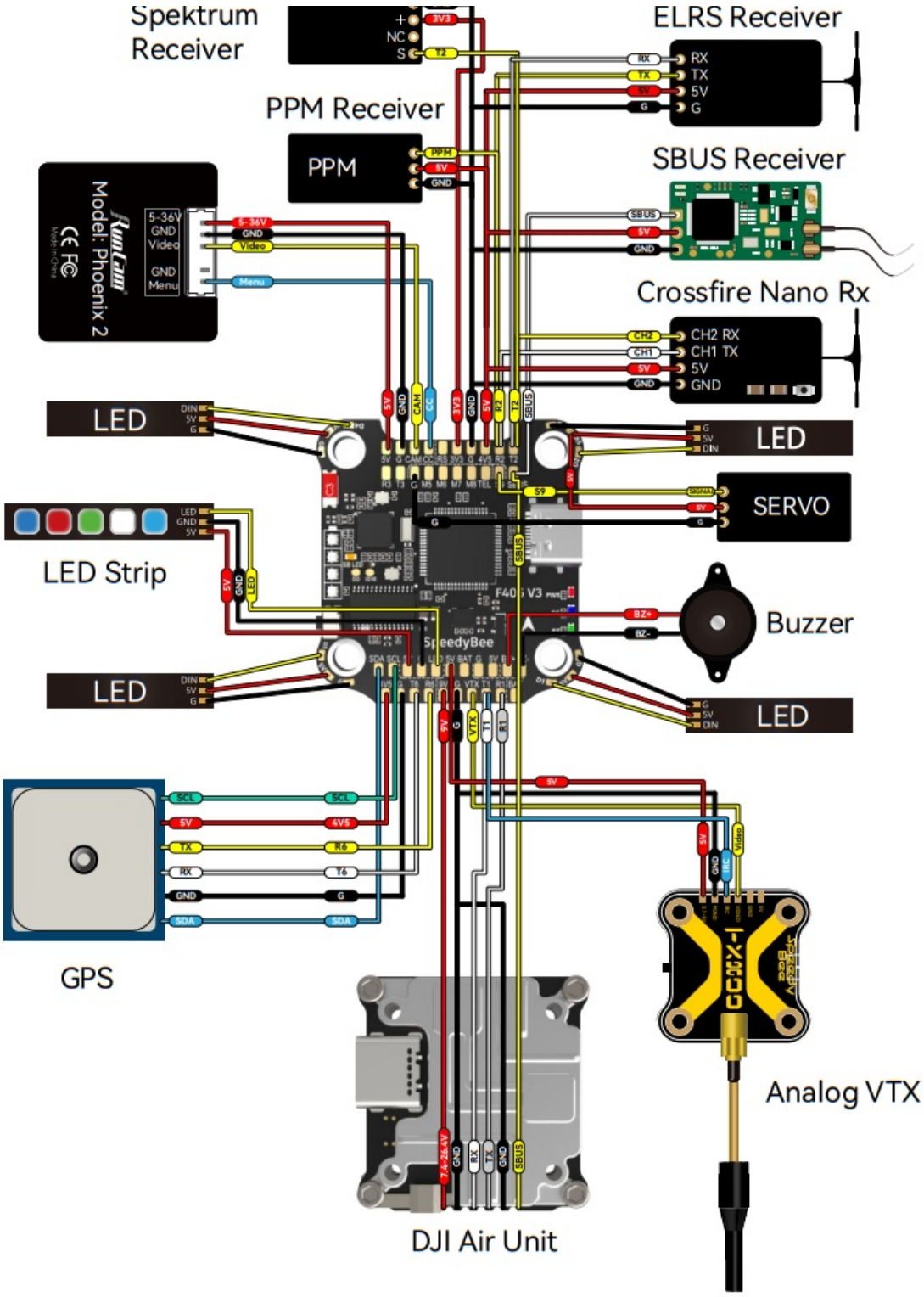


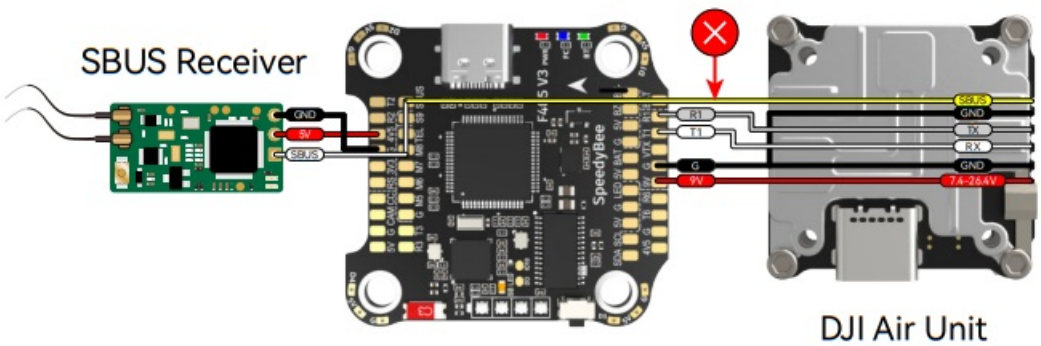


LED Indicator Definition
RED LED – Power Indicator.Solid Red after powering up.
GREEN LED – Bluetooth status light. Solid Green indicates Bluetooth is connected.
BLUE LED – Flight controller status light which is controlled by the flight controller firmware.
Long press the button for 3 seconds to switch the control modes between BF_LED mode and SB_LED mode.
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 tindicates 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.
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/Emuflight/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 controller 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


Spektrum Receiver
ELRS Receiver
PPM Receiver
SBUS Receiver
Crossfire Nano Rx
Model: Phoenix 2
LED
LED
SERVO
LED Strip
Buzzer
LED
LED
GPS
Analog VTX
DJI Air Unit

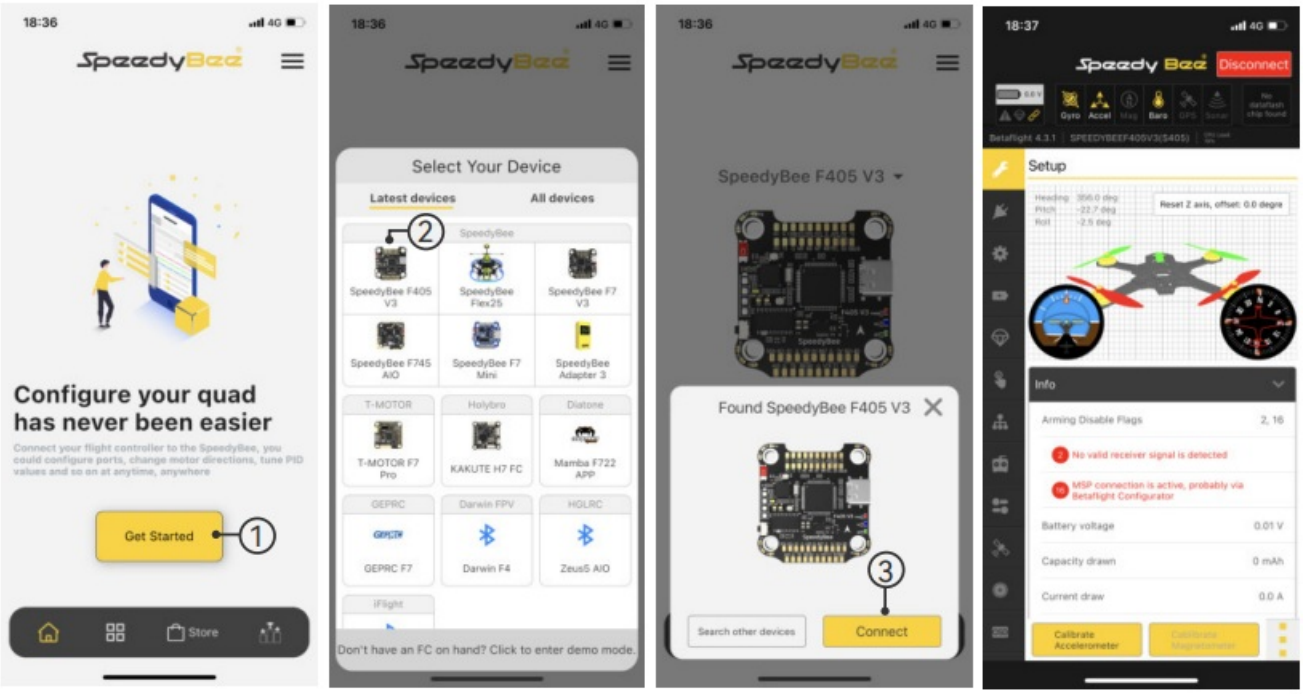

SBUS Receiver
DJI Air Unit

Note: When using both a receiver and an Air Unit (including a direct connection using a ribbon cable) on the F405 V3 flight controller, there is an issue. This arises because the built-in SBUS receiver on the Air Unit and the external receiver are both connected to the Rx2 pad SBUS pad on the flight controller. As a result, the external receiver cannot be recognized properly by the flight controller. To resolve this, it is necessary to disconnect the SBUS wire from the Air Unit or connect the external receiver to the Rx3 pad on the UART3 port. It is known that SBUS receivers and part of the ELRS receivers conflict with the built-in receiver on the Air Unit in the F405 V3 flight controller.Even ELRS reciver has this issue, but TBS reciver will not affected by this issue.

App & FC Configuration

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.

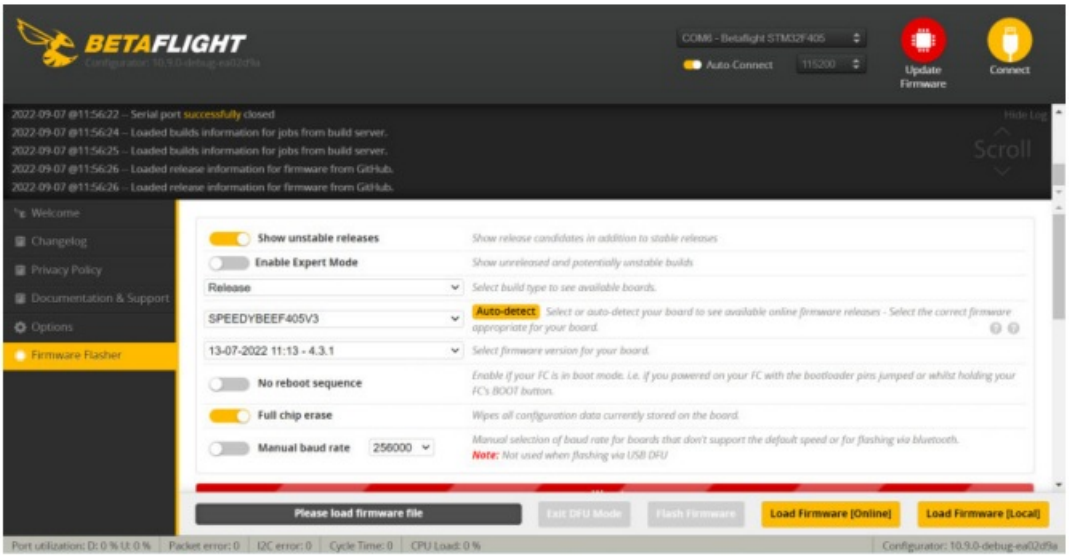
FC Configuration



FC Firmware Update

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 Betafight/ INAV configurator on your PC. Take Betaflight configurator as an example, go to the ‘Firmware Flashing’ page, choose the target ‘SPEEDYBEEF405V3’ and flash.



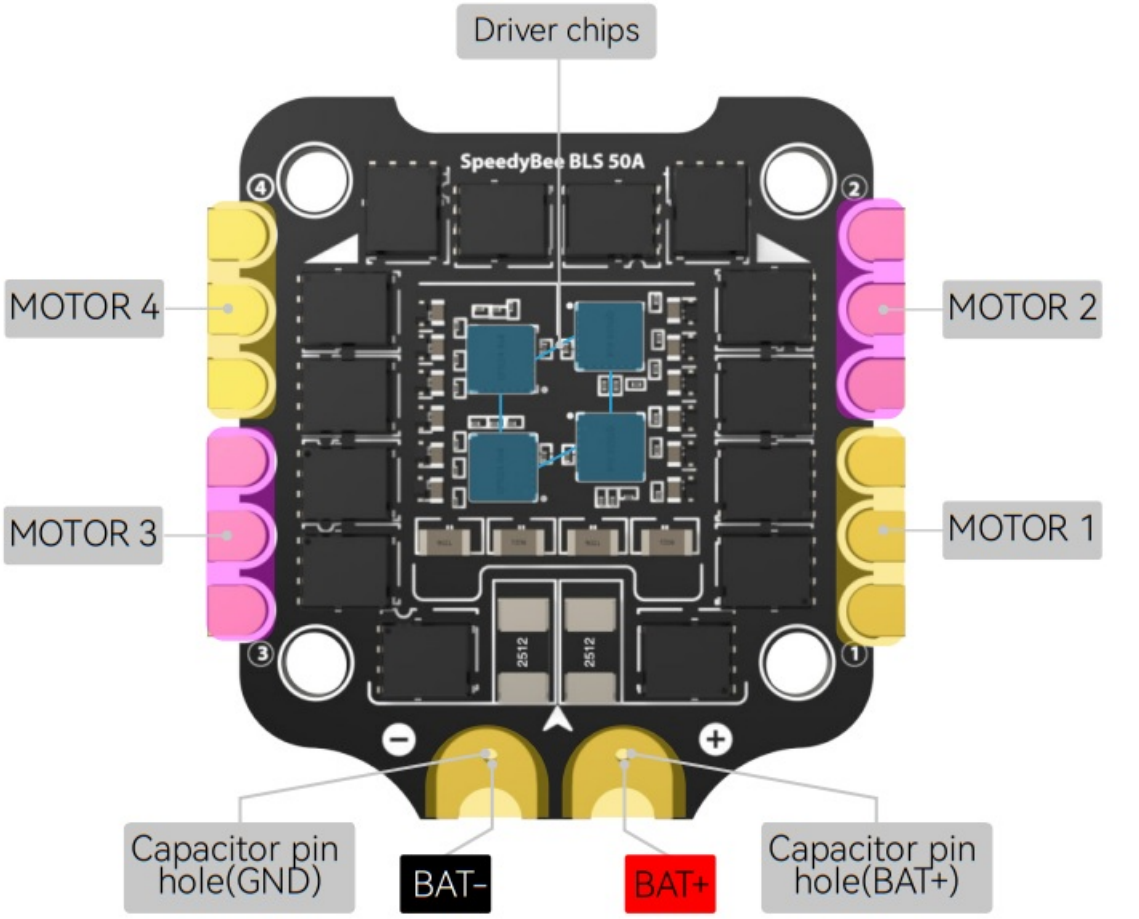
Specifications

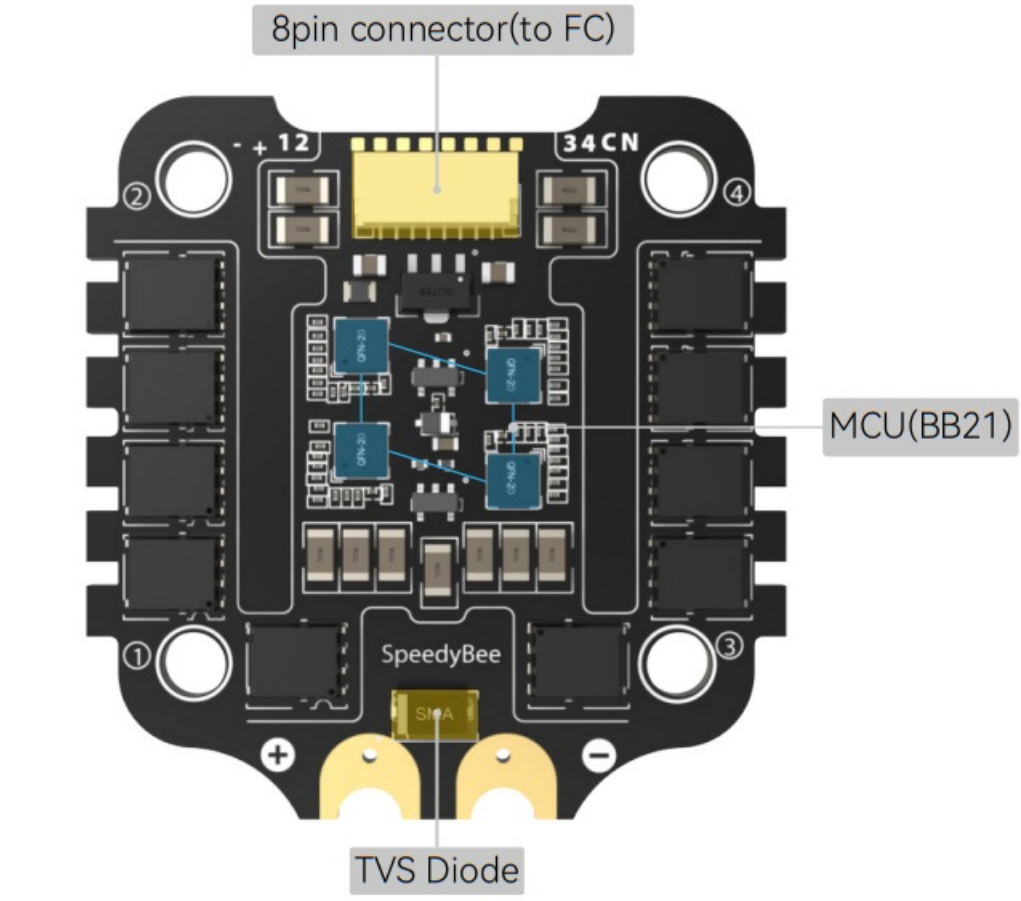
Product Name	SpeedyBee F405 V3 30×30 Flight Controller
MCU	STM32F405
IMU(Gyro)	BMI270
USB Port Type	Type-C
Barometer	Built-in
OSD Chip	AT7456E chip
BLE Bluetooth	Supported. Used for Flight Controller configuration (MSP should be enabled with Baud rate 115200 on UART4)
WIFI	Not supported
WI Air Unit Connection 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	*Betafilght firmware requires the type of the microSD card to be either Standard (SDSC) or High capacity (SDHC), so extended capacity cards (SDXC) are not supported(Many highspeed U3 cards are SDXC). Also the card MUST be formatted with the FAT16 or FAT32 (recommended) flesystems. So, you could use any SD card less than 32GB, but the Betalight can only recognize 4GB maximum. We suggest you use this 3rd party formatting tool and choose ‘ Overwrite format then format your card. Also check out bra for the recommended SD cards or buy the lasted carrlq from our store.
Current Sensor Input	Supported. For SpeedyBee BLS 50A ESC, please set scale = 386 and Offset = 0.
Power Input	3S – 6S Upo(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 con nector on bottom side. The total current load is 2A.
3.3V Output	Supported. Designed for 3.3V-input receivers. Up to 500mAcurrent load.
4.5V Output	Supported. Designed for receiver and GPS module even when the FC is pow ered through the USB port. Up to 1A current load.
ESC Signal	M1 – M4 on bottom side and M5-M13 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)
12C	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 WS281 2 LED controlled by Betafilght firmware.
Buzzer	BZ+ and BZ- pad used for 5V Buzzer
BOOT Button	Supported. [Al Press and hold BOOT button and power the FC on at the sam e 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, t he 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 butto n to cycle the LED displaying mode. Long-press the BOOT button to switch b etween 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 Fir mware	BetaFlight(Default), INAV (INAV firmware can only use Multishot (recommen ded) and OneShot125. Please note that DShot is not supported.)
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

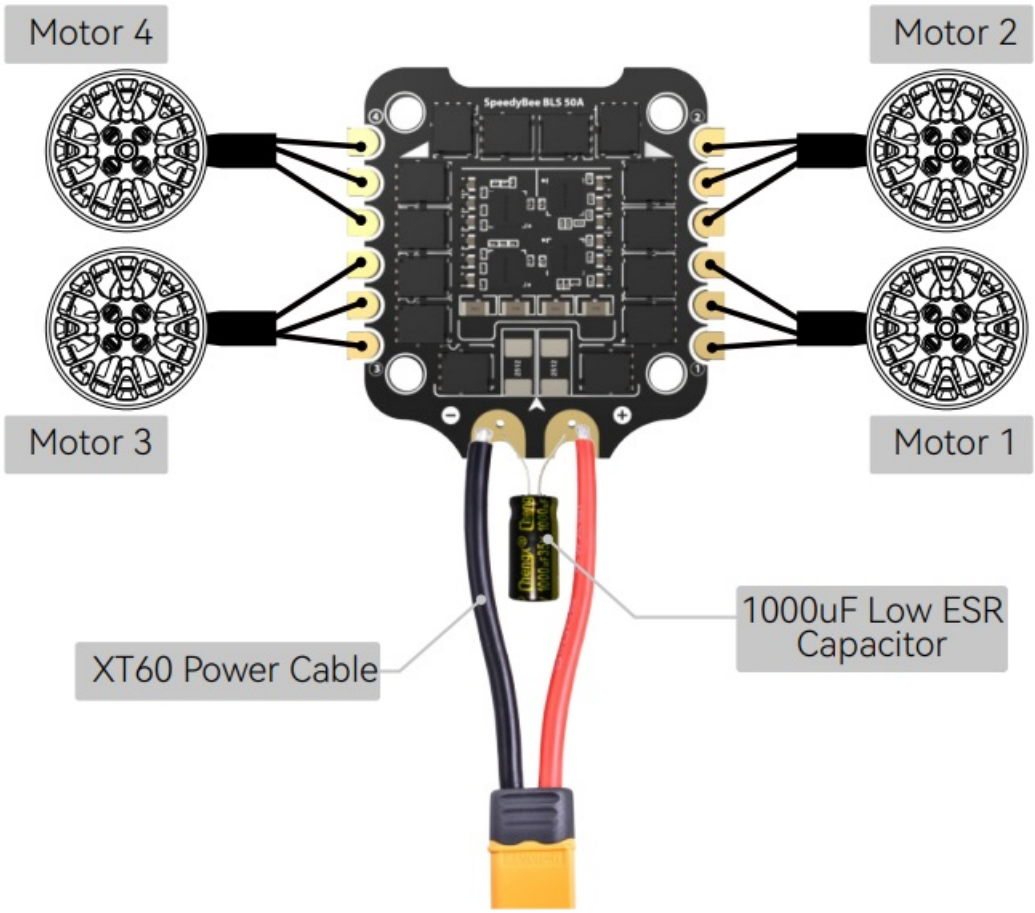
Part 3 – SpeedyBee BLS 50A 4-in-1 ESC

Layout



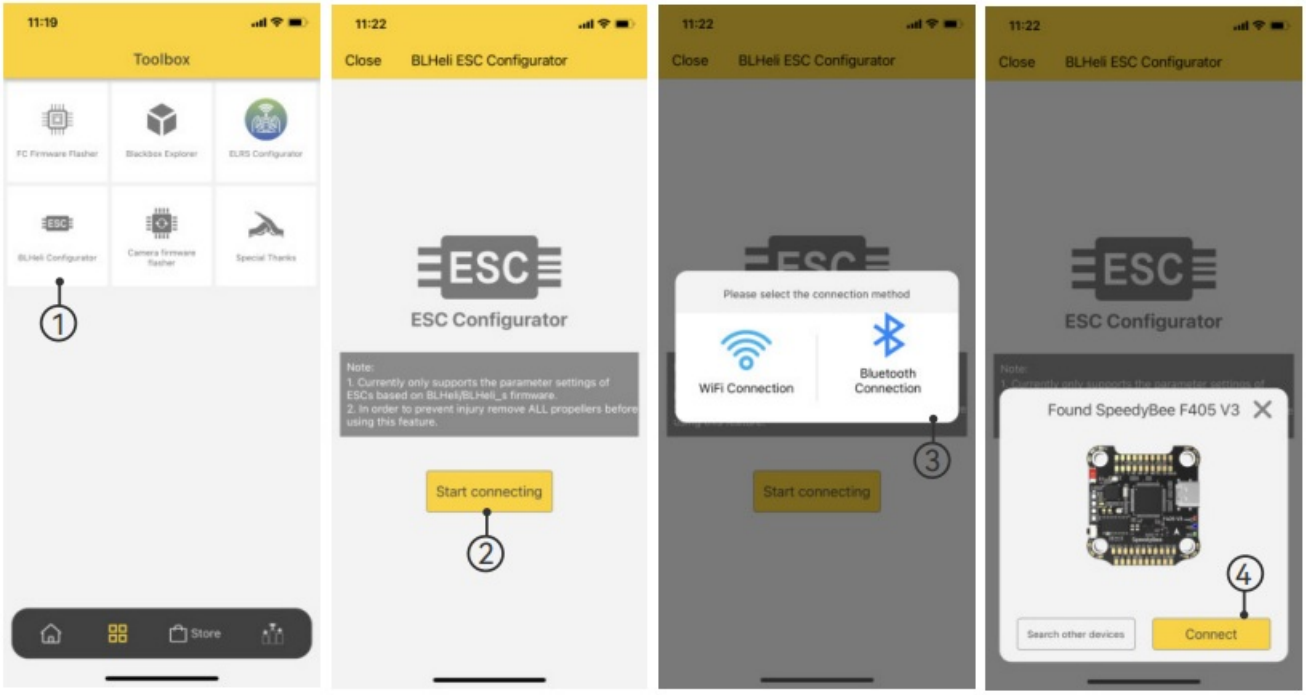


Connection with Motors & Power Cable



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



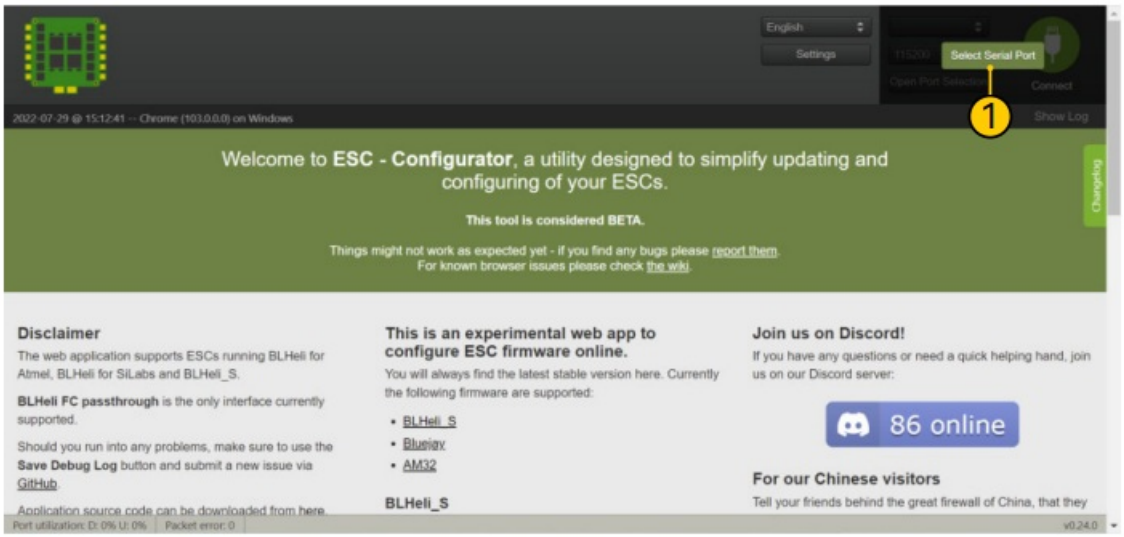
If you'd like to use a PC configurator, we recommend the ESC Configurator.

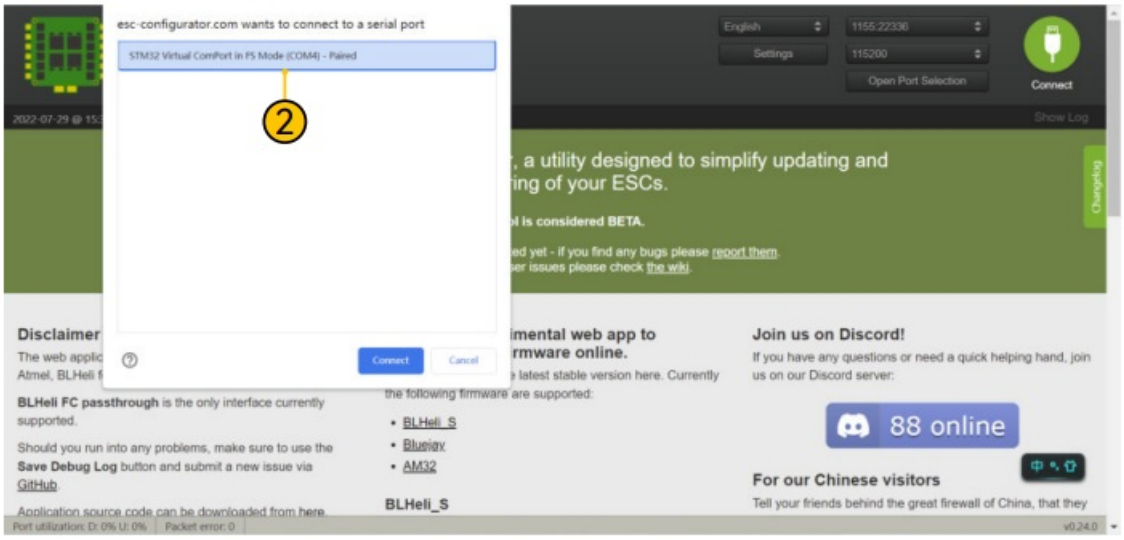
ESC Firmware Update

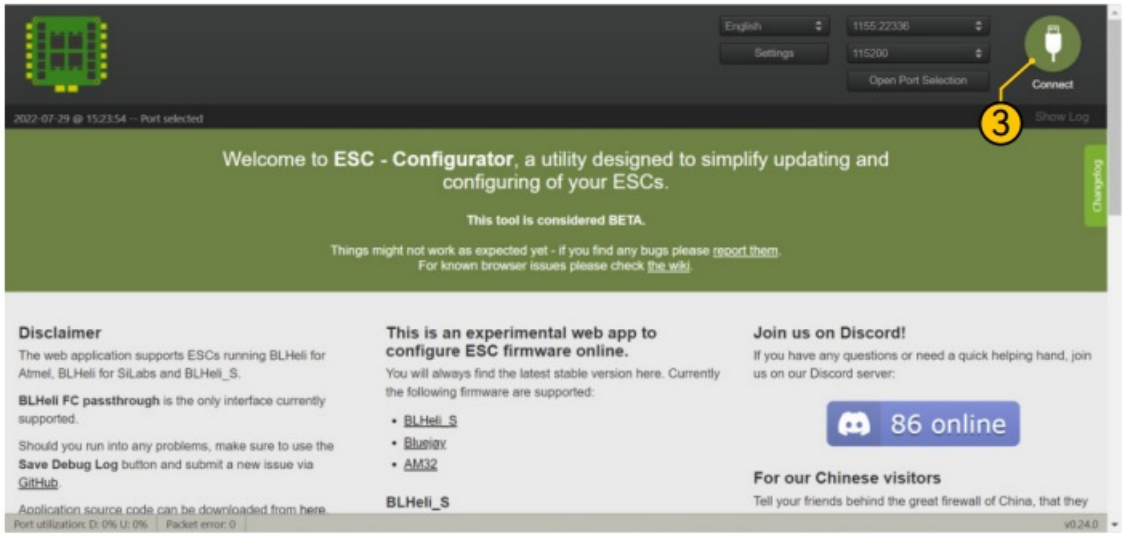
You could flash both BLHeli_S and Blue Jay firmware for this ESC.

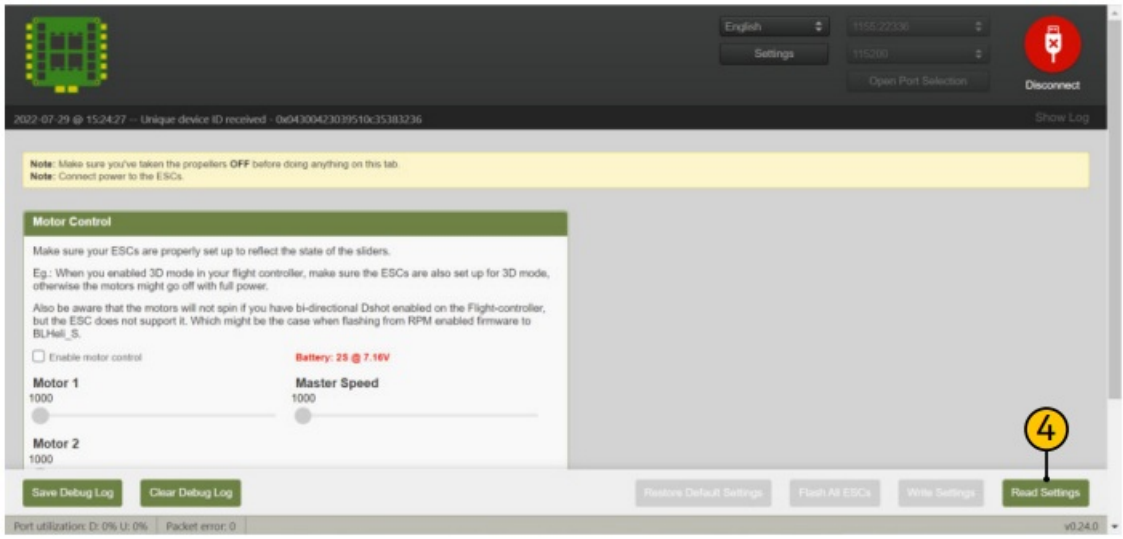
You need to pulg in the battery to the F405 V3 and then connect a USB cable between the F405 V3 and your PC. Then flash ESC firmware (BLHeli_S or Blue Jay) in the following online configurator: **https://esc-**

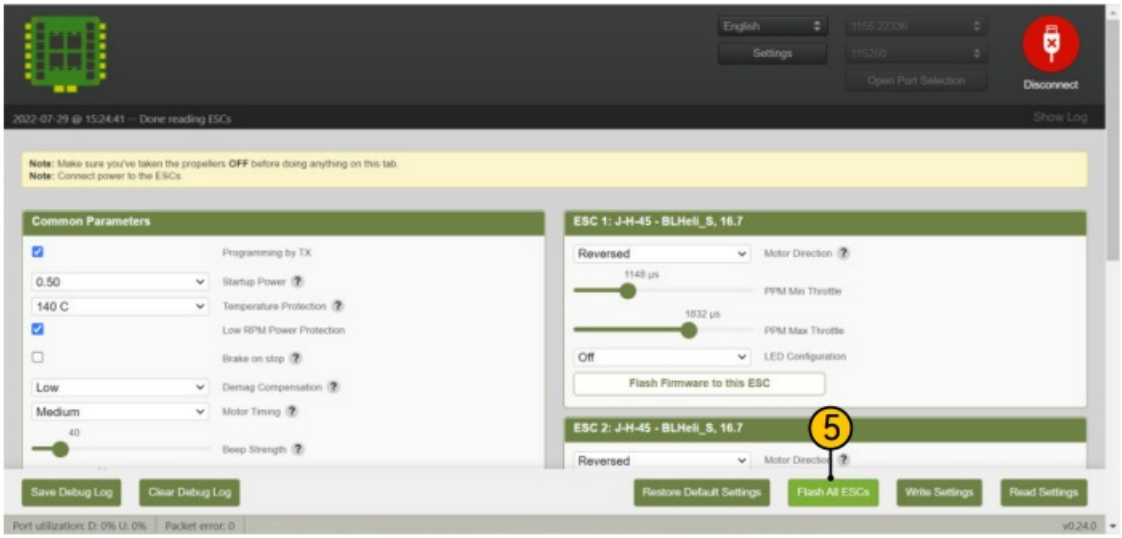
configurator.com/
Note: ESC Type should be set as ‘J-H-50’.

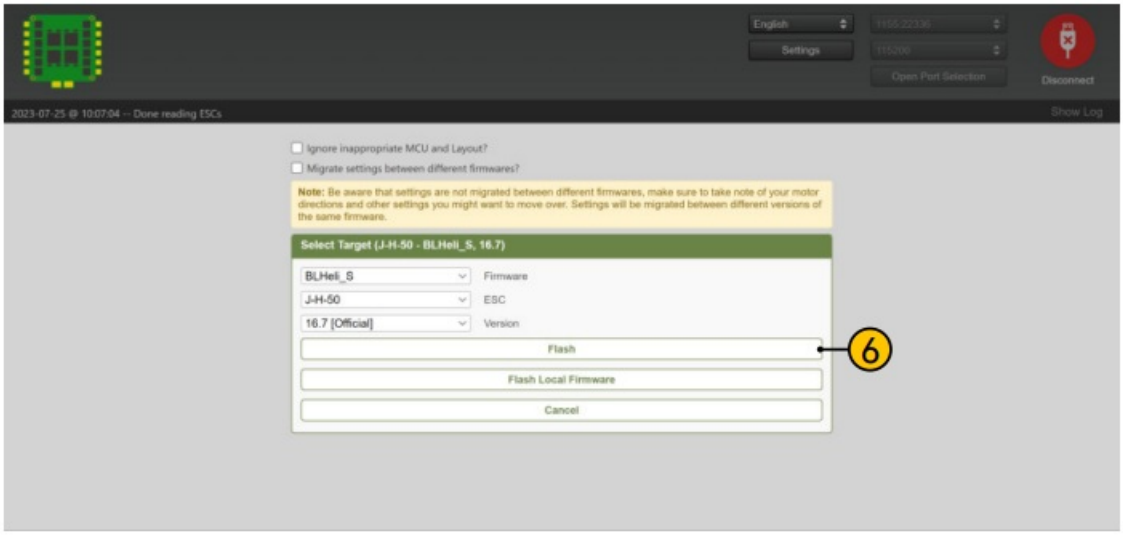





English
Settings
1155:22336
115200
Open Port Selection
Connect
3
2022-07-29 @ 15:23:54 -- Port selected
Show Log
Welcome to ESC - Configurator, a utility designed to simplify updating and configuring of your ESCs.
This tool is considered BETA.
Things might not work as expected yet - if you find any bugs please report them.
For known browser issues please check the wiki.
Changelog
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
This is an experimental web app to configure ESC firmware online.
You will always find the latest stable version here. Currently the following firmware are supported:
BLHeli_S
Bluejay
AM32
BLHeli_S
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
Port utilization: D: 0% U: 0%
Packet error: 0
v0.24.0


English
Settings
1155:22336
115200
Open Port Selection
Disconnect
2022-07-29 @ 15:24:27 -- Unique device ID received - 0x043004230309510c35383236
Show Log
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: 25 @ 7.16V
Motor 1
1000
Master Speed
1000
Motor 2
1000
4
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





Specifications

Product Name	SpeedyBee BLS 50A 30×30 4-in-1 ESC
Firmware	BLHel1SJHSO
Wireless Configuration	Full Configuration Supported in the SpeedyBee app
PC Configurator Download Link	httpsfiesc-configuratanom/
Continuous Current	50A • 4
Burst Current	55145S)
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 (Scalta386 OfseL=0)
Mounting	30.5 x 30.5mm(4mm hole diameter)
Dimension	45.6(1) • 44(W) • 6.1mm(H)
Weight	13.8g

Documents / Resources

	SpeedyBee F405 V3 Flight Controller [pdf] User Manual F405 V3, BLS 50A, F405 V3 Flight Controller, Flight Controller, Controller

References

- ESC Configurator - for Bluejay, BLHeli_S and AM32
- download

Manuals+,