



感谢您使用本产品！本产品功率强大，错误的使用可能导致人身伤害和设备损坏，强烈建议您在设备前仔细阅读本说明书并保存，严格遵守规定的操作程序。我们不承担因使用本产品或擅自对产品进行改造所引起的任何责任，包括但不限于对附带损失或间接损失的赔偿责任。我们有权在不经通知的情况下变更产品的设计、外观、性能及使用要求。

01 主要特性

电调

- MCU:EFM8BB21 MCU，工作频率高达50MHz；
- 高性能、低内阻 Mosfet，不惧大电流，更适合暴力飞行；
- 电调固件：BLHeli-S, A-H-30 或者 Bluejay, A-H-30（以具体产品型号为准）；
- 极筒的两层塔式结构；电调和飞控之间采用快捷式排线连接、硅胶减震柱支撑，有效减少震动对飞控影响；
- Damped light再生制动，使得效率更高，油门从大到小变化时电机减速响应更加迅速，稳定性和灵活性显著加强；
- Bluejay 固件支持Dshot300和Dshot600；
- BLHeli-S支持上电自动检测油门信号，支持普通油门模式1-2ms的脉宽输入、支持 oneshot125, oneshot42和 multishot 信号；支持所有Dshot数字信号；

飞控

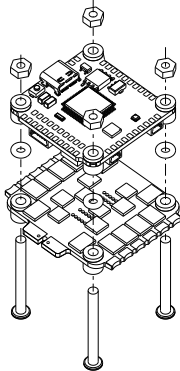
- BF飞控固件：STM32F405；(飞控型号：FLYCOLORF4)
- MCU：STM32F405；
- 陀螺仪：MPU-6500 SPI；
- 气压计：BMP388；
- USB：Type C；
- 支持 SBUS、CRSF、SPEKTRUM等类型接收机；
- 飞控集成3.3V、5V、9V，方便给接收机、图传、摄像头、蜂鸣器、LED灯等外设供电；
- 安装孔：30.5x30.5mm, M3。

02 产品规格

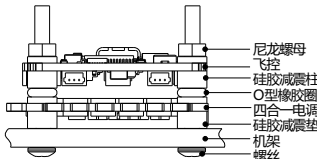
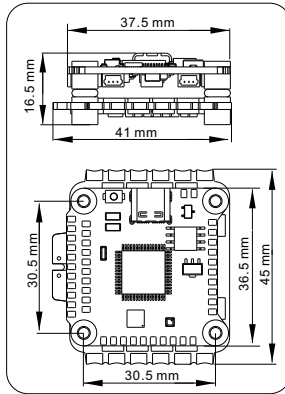
型号	持续电流（散热良好）	飞控输出电压	锂电池节数	重量 (不含配件)	尺寸(供参考)
BLS-04 F4 Tower	45~65A（以具体型号为准）	3.3V/5V/9V	3-6S	27g	41x45x16.5mm

03 元件清单/安装尺寸及示意图

- BLS 4in1 电调 x1
- F4飞控 x1
- ESC/飞控连接线 x1
- 电源线(XT60) x1
- 电解电容 x1
- 其它连接线 x1套
- 3mm 安装配件 x1套



安装尺寸



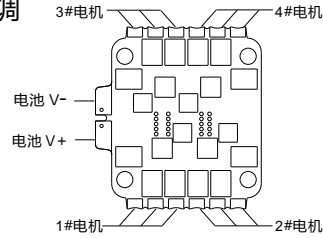
*图片仅供参考，产品以实物为准



- 请使用配件包中的电解电容，焊接在电调正负极两端。
- 请使用随产品附带的配件进行安装，请保持产品器件底部与机架之间有足够的距离，避免短路造成产品损坏。
- 请使用随产品附带的连接线对接，如有更改，连接前务必确认您的连接线路序正确，避免造成产品损坏。

04 电调/飞控端口示意图

电调

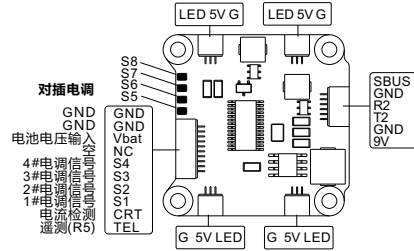
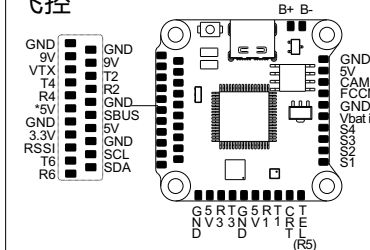


对插飞控



- 所有焊接要求良好的焊接技术，任何时候都需要避免因焊接而造成元件或线材之间短路；
- 为避免短路和漏电，请确保连接处绝缘良好；
- 接电之前务必再次检查极性是否正确；

飞控

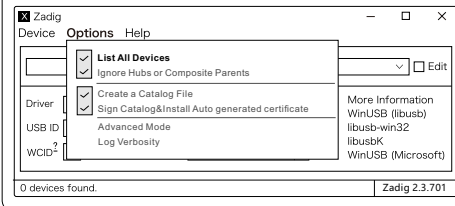


*5V: 插入USB此处有5V 0.1A输出(方便在不上电的情况下调试接收机)；飞控接入电源时为5V 1.5A输出。

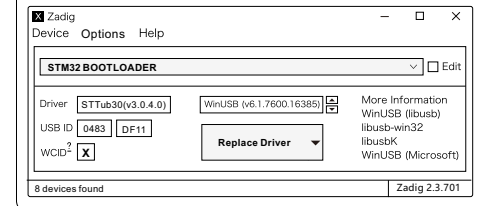
05 飞控固件升级

飞控需使用DFU模式升级固件。首次使用需按照以下步骤使用Zadig工具替换驱动，方能使用DFU模式。

1. 运行Zadig工具；
2. 按住飞控上的BOOT按键不放，使用TypeC USB线将飞控与电脑连接；
3. 点击Options, 选择List All Devices;

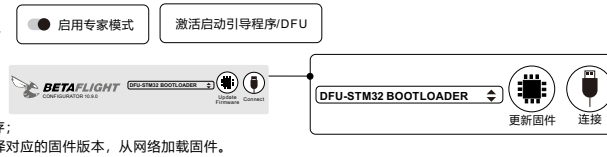


4. 在下拉选项中选择“STM32 BOOTLOADER”，再点击Replace Driver;
5. 直到提示成功，关闭Zadig，断开飞控USB连接；



(注意：如果您之前运行过以上步骤，之后将不再需要重复，直接从第6步开始)

6. 打开Betaflight，将飞控USB与电脑连接，连接后启用专家模式，在设置页面点击激活启动引导程序/DFU，当Betaflight 更改为DFU模式后，此时可进行固件刷写；(或者按住飞控上的Boot键，也可启动DFU模式)



7. 可以通过以下方式刷固件：
 - 1) 加载本地固件：先加载STM32F405.hex，再连接后在CLI窗口输入“FLYCOLORF4”config文件中内容，并输入save保存；
 - 2) 在线加载固件：选择飞控对应型号“FLYCOLORF4”，再选择对应的固件版本，从网络加载固件。

06 注意事项

- 请勿刷写其它的固件和配置，以免损坏飞控；
- SBUS 接收机为固定端口，请手动将UART 3 的Serial Rx打开；CRSF、SPEKTRUM 协议的接收机适用于所有UART口，需手动将需要的UART口的Serial Rx打开；推荐使用UART4；
- 飞控要远离一切磁性材料；
- 当检测到的电压和电流与实际有偏差时，可以调节Betaflight-Power & Battery 中电压计和电流计的Scale值；
- 飞控上3.3V 5V 9V均为输出（3.3V最大0.1A, 5V最大1.5A, 9V最大2A）；
- ESC请勿刷写除其它固件，以免损坏电调；
- 首次使用无刷电调或更换遥控设备后需要进行油门行程校准；Dshot 模式时，将不再需要校准油门；
- 无论任何时候都要注意极性，供电之前一定要反复检查；
- 在插拔或者做任何连接时，请关闭电源；
- 请不要超出ESC工作电流、电压范围使用；
- 请确保所有电线和连接部件绝缘良好，避免短路造成产品损坏；
- 请避免在潮湿、高温等恶劣环境下使用产品，避免造成产品损坏；



Thank you for using our product . Any Improper operation may cause personal injury damage to the product and related equipments. This high power system for RC model can be dangerous ,we strongly recommend reading the user manual carefully and completely. We will not assume any responsibility for any losses caused by unauthorized modifications to our product. We have the right to change the design, appearance, performance and usage requirements of the product without notice.

01 Main features

ESC

- MCU:EFM8BB21MCU, frequency up to 50 MHz.
- MOSFET with high performance and low Rds , not afraid of large current, more suitable for rapid flight.
- ESC firmware: BLHeli-S, A-H-30 or Bluejay, A-H-30 (Please refer to the exact product model).
- Two layers tower structure between 4in1 ESC and FC, using cable for quick connection, using silicone vibration absorber for supporting, reducing the effect of vibration on Flight Control.
- Damped light does regenerative braking, causing very fast motor retardation, and inherently also does active freewheeling.
- Bluejay firmware supports Dshot300 & Dshot600.
- BLHeli-S code supports regular 1-2ms pulse width input, as well as Oneshot125 , Oneshot42 and Multishot , supports all Dshot .

Flight Control

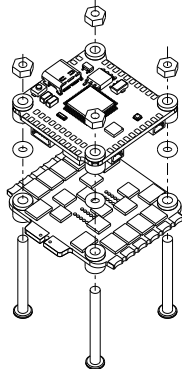
- BF firmware: STM32F405; (F.C.Config.: FLYCOLORF4)
- MCU: STM32F405.
- Gyro: MPU-6500 SPI.
- Barometer: BMP388.
- USB: Type C.
- Supports SBUS, CRSF, SPEKTRUM etc. remote control / receiving mode.
- FC integrated 3.3V, 5V, 9V for receiver, VTX, camera, buzzer, LED and other peripheral devices.
- Install holes: 30.5x30.5mm, M3.

02 Specifications

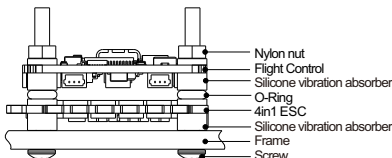
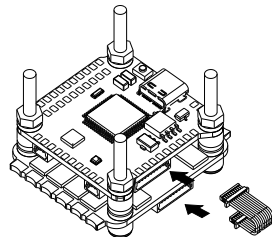
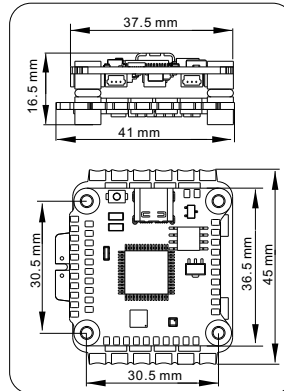
Model	Con. Current (Good heat dissipation)	F.C Vout	LiPo cells	Weight (Without accessories)	Size (For reference)
BLS-04 F4 Tower	45~65A (Subject to specific model)	3.3V/5V/9V	3-6S	27g	41x45x16.5mm

03 Part list / Install Dimensions and Diagram

- BLS 4in1 ESC x1
- F4 Flight Control x1
- ESC /FC connecting wire x1
- Power wire(XT60) x1
- Electrolytic capacitor x1
- Other wires x1set
- 3mm Mounting Accessories x1set



Dimensions



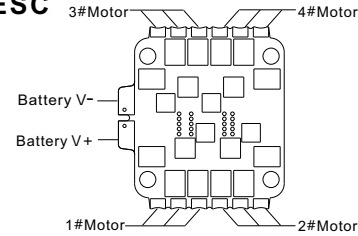
*All pictures are for reference only



- Please solder the electrolytic capacitor which are included in the accessory pack to the positive and negative terminals of ESC.
- Please use the parts supplied with the product for mounting. Please ensure enough safety space between the Product & Drone frames, as short circuit will damage the product.
- Please use the wire supplied with the product for connecting. If there is any change, before connecting, make sure your connecting wire is in correct order to avoid product damage.

04 Connect diagram of ESC and FC

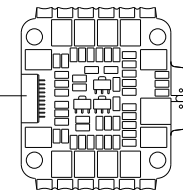
ESC



To Flight control

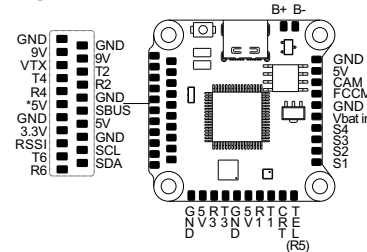
GND
Vbat Output
No Connection
4# signal
3# signal
2# signal
1# signal
Current meter
No Connection

GND
GND
Vbat
NC
S4
S3
S2
S1
CRT
NC



- All soldering tasks require good soldering technique, short circuit between components or wires should be avoided at any time.
- Please ensure that all wires and connecting parts are well insulated to avoid product damage due to short circuit.
- Please double-check the polarity is correct before power up.

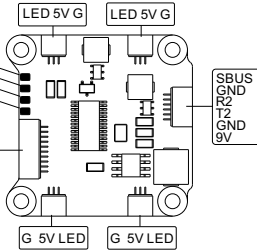
F.C



To ESC

GND
GND
Vbat Input
No Connection
4# signal
3# signal
2# signal
1# signal
Current meter
Telemetry(R5)

GND
GND
Vbat
NC
S4
S3
S2
S1
CRT
TEL

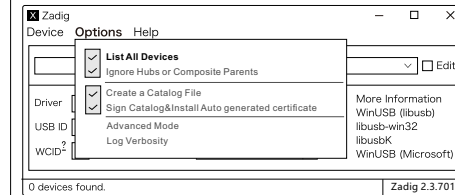


*5V: 5V 0.1A output here after inserting USB, (it is convenient to debug the receiver without power on); 5V 1.5A output here after flight control power on.

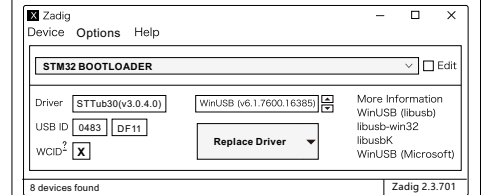
05 Load firmware for FC

You need to use DFU mode to recover firmware for Flight control, and need a software tool called Zadig to replace the driver for you F.C when you load firmware at the first time.

1. Start the Zadig software tool;
2. Press and hold the "BOOT" on the FC, connect the FC to the PC.
3. Click "Options", and select "List All Devices".



4. Then select "STM32 BOOTLOADER", Then click "Replace Driver"
5. Close the Zadig software tool when replace successfully, Then disconnect the FC from the PC.



(Notice: If you've run the above steps before, then you don't need to repeat, starting directly from the 6th step)

6. Start the Betaflight on the PC; connect the FC to the PC. Enable Expert Mode after connecting, then click the Activate Boot Loader /DFU on Setup page then the FC is connected in the "DFU" mode, then you can load the firmware; (or press and hold the "BOOT" on the FC to enter DFU)



7. You can load the firmware as below :

- 1) Local: First load the STM32F405.hex file, then connect and input the contents of "FLYCOLORF4" config file in the CLI ,and enter "save".
- 2) Online: Select FC board "FLYCOLORF4", and select the correct firmware version for the board, then load the firmware online.

06 Attentions

- Please don't load any other firmware or config. for FC .
- SBUS is a fixed port, please turn on the "Serial RX" of the UART 3 port for SBUS receiver. CRSF, SPEKTRUM receivers are applicable to all UART ports, turn on the "Serial RX" of the UART port you need, UART4 is recommended.
- Flight control should be far away from all magnetic materials.
- If there is any deviation between the detected voltage/current with actual situation, you can adjust the scale value in the Betaflight-Power&Battery.
- 3.3V, 5V, 9V supply is for low-current use only (3.3V 0.1A max, 5V 1.5A max, 9V 2A max).

- Please don't load any other firmware for ESC.
- User needs to calibrate the throttle range when starting to use a new ESC or another transmitter. When the input signal is Dshot, throttle calibration is disabled.
- Observe polarity at all times. Check and double check before applying power.
- Power off before unplugging, plugging in or making any connections.
- Please do not exceed the current & voltage range of ESC.
- Please ensure that all wires and connecting parts are well insulated to avoid product damage due to short circuit.
- Never use this product in harsh environments such as humidity, high temperature, and so on to avoid product damage.