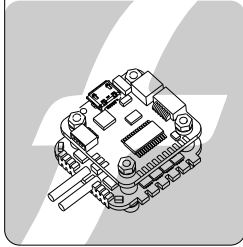




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01 主要特性

电调

- MCU: EFM8BB21F16G MCU, 8位C8051核心, 工作频率高达50MHz;
- 专用三合一驱动IC, 启动更加舒畅。电调支持最高50万转速;
- 电调固件: BLHeli-S, F-H-40;
- 极简的两层塔式结构; 电调和飞控采用快捷排线连接, 硅胶减震柱有效减少震动对飞控的影响, 提高飞行稳定性;
- 电调使用BLHeli-S固件, 专为多旋翼提升优越的性能, 硬件产生的电机PWM可提升油门响应和降低噪音;
- 电调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;
- 全面支持Dshot150, Dshot300和Dshot600. Dshot为数字信号, 抗干扰能力强, 而且电调不需要校准油门行程。

飞控

- MCU: STM32F405;
- 陀螺仪: MPU-6000 SPI;
- 飞控固件: OMNIBUSF4;
- 支持PPM, SBUS, SPEKTRUM1024/2048等类型接收机;
- 飞控集成OSD, 可以使用BetaFlight调参软件调整OSD参数;
- 飞控集成3.3V、5V以及电池电压VBAT方便给接收机、图传、摄像头、蜂鸣器、LED灯等外设供电;
- 配有快速连接线, 支持主流摄像头、图传等设备; 给您前所未有的安装体验;
- 安装孔: 20x20mm, M2。

02 产品规格

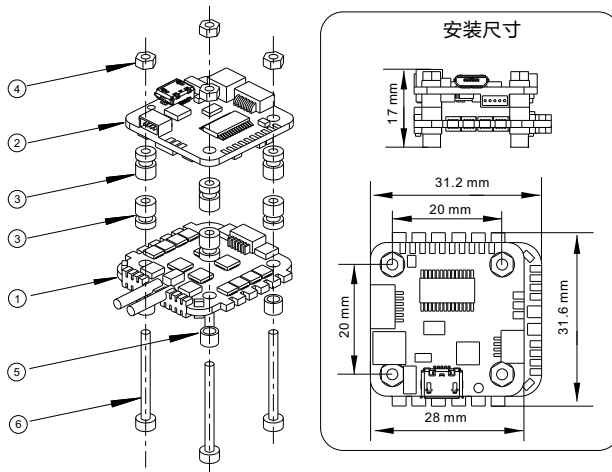
型号	持续电流	瞬时电流 (10S)	飞控输出电压	锂电池节数	重量	尺寸(供参考)	典型应用(供参考)
Raptor S-Tower F4-20A	20A	30A	3.3V, 5V	2-4S	14.6g	31.6x31.2x17mm	120-180多旋翼

03 元件清单/安装尺寸

序号	描述	数量
①	猛禽BL S-Tower 20A四合一电调	1
②	F4飞控	1
③	硅胶减震柱	8
④	尼龙螺母 M2	4
⑤	隔离柱	4
⑥	螺钉 M2*22	4

1.为实现快速安装, 额外提供了:

- 一根6Pin线束 (6p SH1.0端子), 用于电调-飞控电源、信号;
- 一根3Pin线束 (4p SH1.0端子), 用于PPM接收机;
- 一根3Pin线束 (4p SH1.0端子), 用于SBUS接收机;
- 一根5Pin线束 (5p SH1.0端子), 用于LED、蜂鸣器;

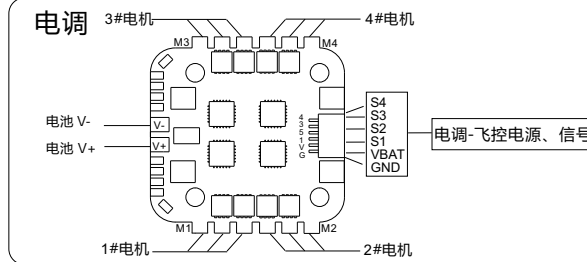


*图片仅供参考, 产品以实物为准

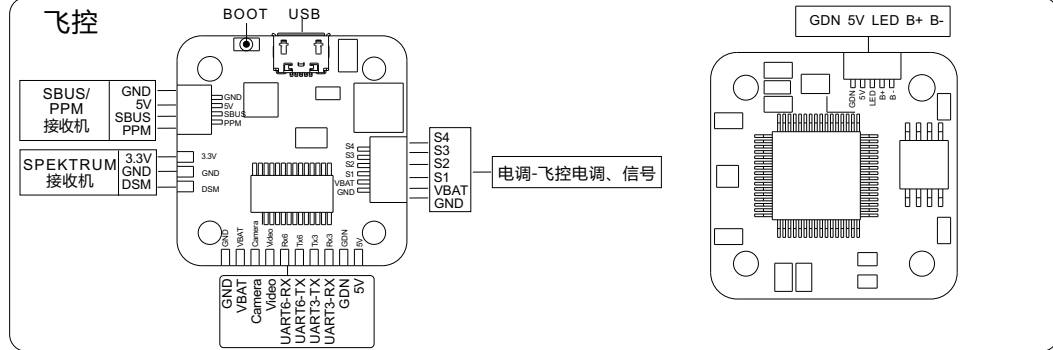


- 对于快速安装线束, 连接前务必须确认您设备接口的线序与飞控接口的线序是对应关系。如果您的图传或摄像头不适用配件连接线的端子, 请改装连接线以适用于您的设备。
- 请确保所有电线和连接部件绝缘良好, 避免短路造成产品损坏。
- 请保持产品部件底部与机架之间有足够的距离, 避免短路造成产品损坏;
- 请避免在潮湿、高温等恶劣环境下使用产品, 避免造成产品损坏。

04 电调及飞控连线示意图



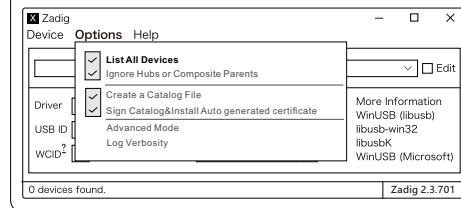
- 所有焊接要求良好的焊接技术, 任何时候都需要避免因焊接而造成元件或线材之间短路;
- 为避免短路和漏电, 请确保连接处绝缘良好;
- 接电之前务必再次检查极性是否正确;



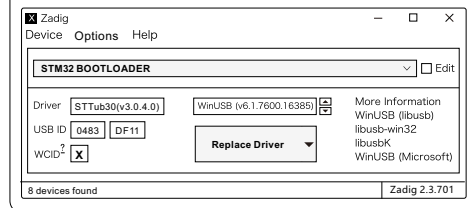
05 飞控固件升级

F4 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键不放, 使用Micro 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;
- 7.按住飞控上的Boot键, 将飞控USB与电脑连接, 此时看到Betaflight更改为DFU模式连接, 此时可以进行固件刷写;
- 8.可以通过两种方式刷固件: 加载本地固件 (推荐, 需在Betaflight官网提前下载) 和在线加载固件;



06 注意事项

- 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;
- 使用BLHeli-S开源程序, 请勿刷写除F-H-40以外的固件, 以免损坏电调;
- 请勿超出电调规定最大电流使用;
- 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;
- 可以做一些减震措施尽量避免震动, 因加速度计/陀螺仪对震动很敏感;
- 飞控要远离一切磁性材料;
- 飞控固件请勿刷写除OMNIBUSF4以外的固件, 以免损坏飞控;
- PPM 接收机无需设置端口;
- SBUS或者SPEKTRUM 接收机需手动将UART1的Serial RX打开;
- 接收机需手动将UART1的Serial RX打开;
- 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;
- 3.3V 5V只能用于低功率设备 (3.3V最大0.1A, 5V最大1A);
- 如需更多信息, 请联系飞盈佳乐售后或者技术支持。



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.

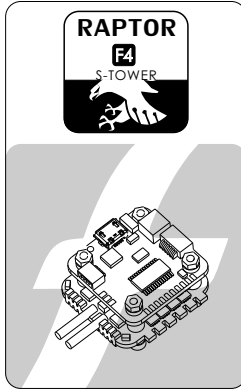
01 Main features

ESC

- EFM8BB21F16G MCU, pipelined 8-bit C8051 core with 50 MHz maximum operating frequency.
- Dedicated 3in1 drivers, makes the start more smooth. ESC maximum speed is limited to 500k eRPM.
- ESC firmware: BLHeli-S , F-H-40.
- Two layers tower structure between 4in1 ESC and FC, using cable for quick connection, silicon spacer for supporting could reduce the effect of vibration on Flight Controller, makes the flight more stable.
- BLHeli-S firmware. It is designed for superior performance in multirotors, and uses hardware generated motor pwm for smooth throttle response and silent operation.
- The code supports regular 1-2ms pulse width input, as well as Oneshot125 , Oneshot42 and Multishot .
- Supports Dshot150, Dshot300 and Dshot600.Dshot is digital signal, anti-interference ability is stronger, and do not need throttle calibration.

Flight Controller

- MCU:STM32F405.
- Gyro : MPU-6000 SPI.
- FC firmware:Betaflight_OMNIBUSF4
- Supports PPM,SBUS,SPEKTRUM1024/2048 etc. remote control / receiving mode.
- FC integrated OSD, users can adjust OSD parameters via Betaflight configurator.
- FC integrated 3.3V,5V and VBAT for receiver, VTX, camera, buzzer, LED and other peripheral devices.
- Provided several cables for peripheral devices such as VTX, camera etc. And will give you an unprecedented experience for assembly;
- Install holes: 20x20mm,M2.



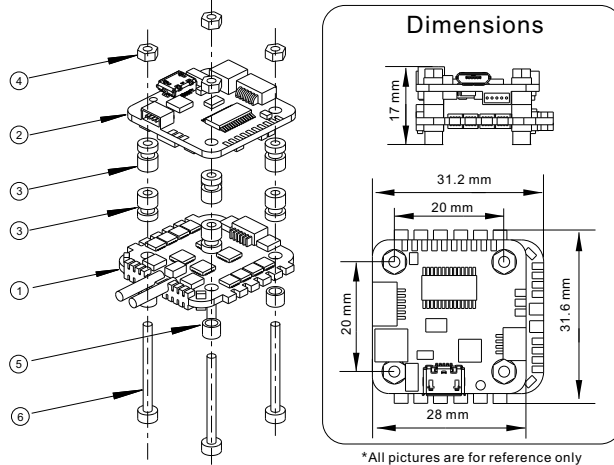
02 Specifications

Model	Con. Current	Burst Current (10S)	F.C Vout	LiPo cells	Weight	Size (For reference)	Typical Applications (For reference)
Raptor S-Tower F4-20A	20A	30A	3.3V,5V	2-4S	14.6g	31.6x31.2x17mm	120-180 Multi

03 Part list / Dimensions

Item	Description	Qty.
①	Raptor BLS 20A 4in1 ESC	1
②	F4 Flight Controller	1
③	Silicon spacer	8
④	Nylon nut M2	4
⑤	Plastic spacer	4
⑥	Screw M2*22	4

- 1.For quick plug, Flight Controller additionally provide:
- One 6p cable (6-pin SH1.0 terminal) for the power & signal between ESC and Flight controller;
 - One 3p cable (4-pin SH1.0 terminal) for SBUS receivers;
 - One 3p cable (4-pin SH1.0 terminal) for PPM receivers;
 - One 5p cables(5-pin SH1.0 terminal) for LED,Buzzer;

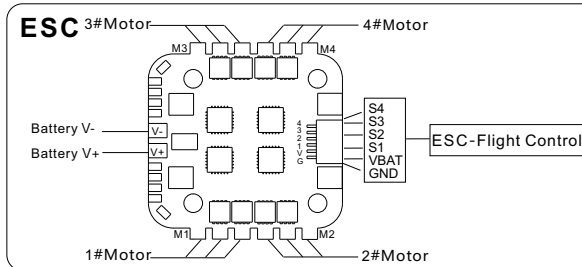


*All pictures are for reference only

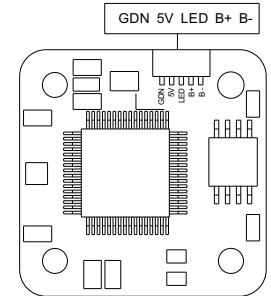
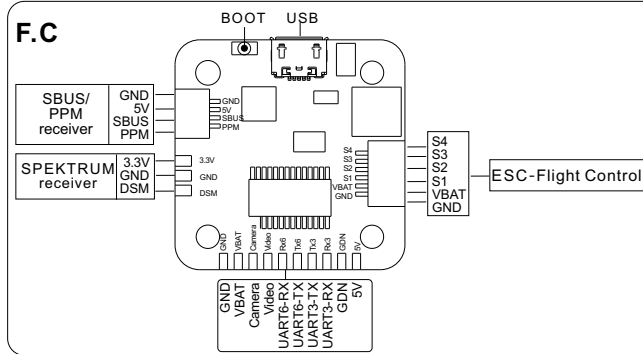


- For these quick plug cables, please confirm the wire sequences on your devices' connector are corresponding with the Flight controller's before connecting. If the terminals are not fit your devices ,please make a modified connection to fit.
- Please ensure all solder joints & wires are insulated well, as short circuit will damage the product.
- Please ensure enough safety space between the ESC & Drone frames, as short circuit will damage the product.
- Never use this product in harsh environments such as humidity, high temperature, and so on to avoid product damage

04 Connect diagram of ESC and FC



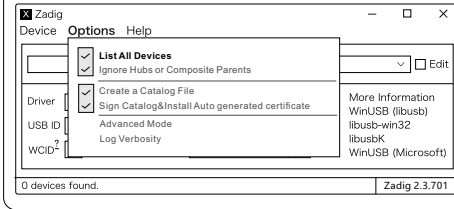
- All soldering tasks require good soldering technique, short circuit between components or wires should be avoided at any time.
- Please ensure all solder joints are insulated with heat shrink where necessary.
- Please double-check the polarity is correct before power up.



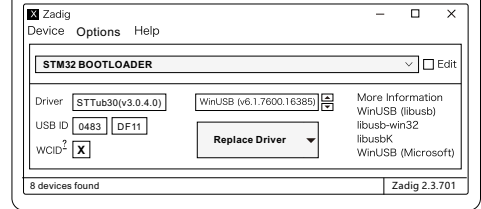
05 Flash firmware for FC

You need to use DFU mode to recover firmware for F4 Flight controller, and need a software tool called Zadig to replace the driver for you F.C when you flash 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" configurator on the PC;
7. Press and hold the "BOOT" on the FC, connect the FC to the PC, then the FC is connected in the "DFU" mode, then you can flash the firmware;
8. For the firmware flashing, you can choose to load the firmware online or local (Local is recommended, it needs to download in advance in Betaflight website)



06 More information

- 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.
- BLHeli-S firmware, please don't flash any other firmware except "F-H-40".
- Please do not exceed the ESC current range.
- Observe polarity at all times. Check and double check before applying power.
- Power off before unplugging, plugging in or making any connections.
- Keep magnets away from the Flight Controller.
- Do everything you can to prevent vibrations.
- Please don't flash any other firmware for FC except "OMNIBUSF4".
- PPM receiver does not need to set the port.
- SBUS or PEKTRUM receiver needs to turn on the "Serial RX" of UART1 port.
- 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 supply is for low-current use only(3.3V 0.1A MAX, 5V 1A MAX).
- Please contact Flycolor sales or technical support for more information.