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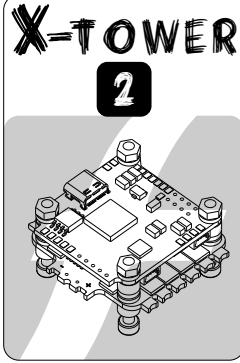
01 主要特性

电调

- MCU: STM32F051, ARM 32-bit Cortex 核心MCU, 工作频率高达48MHz;
- 高性能、低内阻 Mosfet, 不惧大电流, 更适合暴力飞行;
- 电调固件: Flycolor_X_Cross_BL_32;
- 极简的两层塔式结构; 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;
- 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;
- 支持所有Dshot和Proshot数字信号。

飞控

- 飞控固件: STM32F7X2 (配置文件: FLYCOLORF7);
- 飞控型号: FLYCOLORF7;
- MCU: STM32F722;
- 陀螺仪: MPU-6000 SPI;
- 蓝牙名称: FC_Bluetooth;
- USB: Type C;
- 支持 SBUS, SPEKTRUM1024/2048等类型接收机;
- 飞控集成3.3V、5V、10V, 方便给接收机、图传、摄像头、蜂鸣器、LED灯等外设供电;
- 4路LED端口, 独立5V BEC供电, 使得供电更安全可靠;
- 可支持BetaFlight调参软件调整LED灯带颜色;
- 安装孔: 30.5x30.5mm, M3。

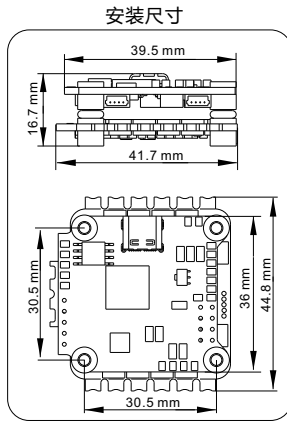
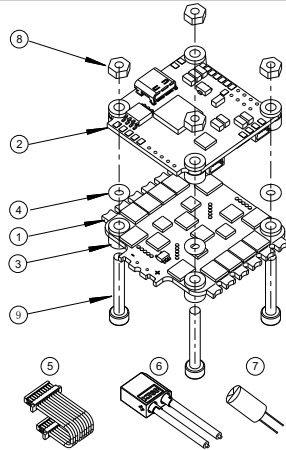


02 产品规格

型号	持续电流 (散热良好)	瞬时电流 (10S)	飞控输出电压	锂电池节数	重量 (不含配件)	尺寸(供参考)	典型应用(供参考)
X-Tower 2-60A	60A	70A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	210-550多旋翼
X-Tower 2-45A	45A	55A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	170-450多旋翼
X-Tower 2-30A	30A	40A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	170-210多旋翼

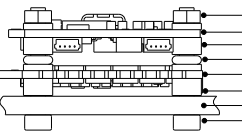
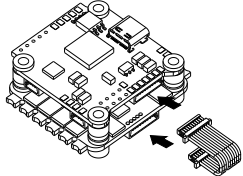
03 元件清单/安装尺寸及示意图

序号	描述	数量
①	32bit 四合一电调	1
②	F7飞控	1
③	硅胶减震垫	8
④	O型橡胶圈	4
⑤	电调/飞控连接线(2x10p SH1.0)	1
⑥	电源线(XT60)	1
⑦	电解电容*	1
⑧	尼龙螺母	4
⑨	螺丝	4



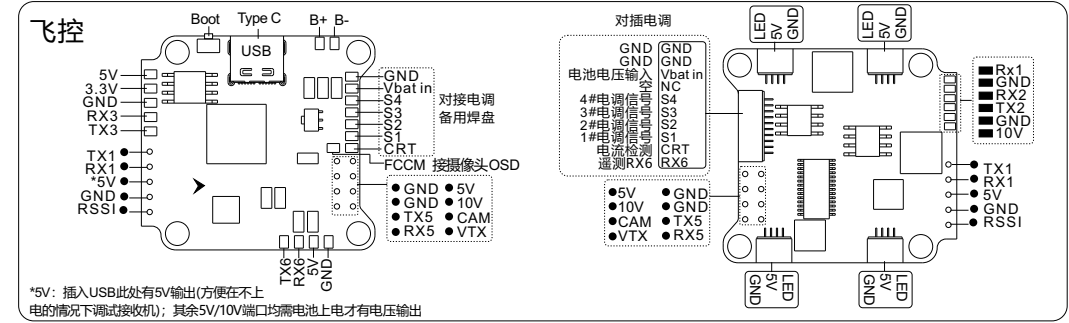
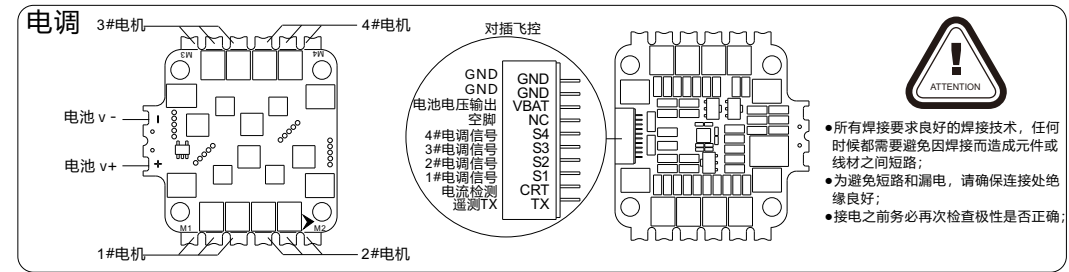
*为增强更好的滤波效果, 用户可选择使用配件包中的电解电容, 焊接在正负极两端。

*图片仅供参考, 产品以实物为准



- 请使用随产品自带的配件进行安装, 请保持产品器件底部与机架之间有足够的空间, 避免短路造成产品损坏;
- 请使用随产品自带的电调/飞控连接线对接, 如有更改, 连接前务必确认您的连接线路正确, 避免造成产品损坏。

04 电调/飞控端口示意图



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。

- 运行Zadig工具, 2. 按住飞控上的BOOT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;
- 在下拉选项中选择“STM32 BOOTLOADER”, 再点击Replace Driver;
- 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)

- 打开Betaflight; 按住飞控上的Boot键, 将飞控USB与电脑连接, 看到Betaflight更改为DFU模式连接, 此时可进行固件刷写;
- 可以通过两种方式刷固件:
 - 1) 加载本地固件: (推荐, 需提前下载或询问Flycolor) 先加载STM32F7X2.hex, 再连接后在CLI窗口输入FLYCOLORF7.config文件中内容, 并输入save保存;
 - 2) 在线加载固件: 飞控型号选择FLYCOLORF7, 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;
- 蓝牙端口固定为UART4的MSP;
- SBUS和SPEKTRUM接收机适用于所有UART口 (UART4除外, UART4固定为蓝牙), 需手动将需要的UART口的Serial RX打开; SBUS推荐使用UART1; SPEKTRUM推荐使用UART3;
- 遥测端口推荐使用UART6, 使用电调/飞控连接线直接对接即可;
- 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5V 10V均为输出, 只能用于低功率设备 (5V最大3A, 10V最大1.5A);
- ESC使用BLHeli-32开源程序, 请勿刷写除“Flycolor_X_Cross_BL_32”以外的固件, 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;
- 如需更多信息, 请联系Flycolor售后或技术支持。



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.

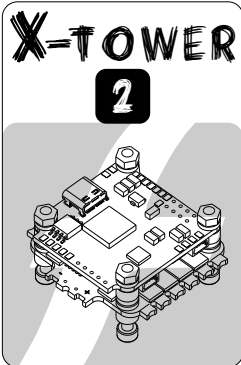
01 Main features

ESC

- MCU:STM32F051 ,ARM 32-bit Cortex MCU, frequency up to 48 MHZ.
- MOSFET with high performance and low Rds , not afraid of large current, more suitable for rapid flight.
- ESC firmware: Flycolor_X_Cross_BL_32.
- 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.
- The code supports regular 1-2ms pulse width input, as well as Oneshot125 , Oneshot42 and Multishot .
- All Dshot and Proshot signals are supported.

Flight Control

- FC firmware:STM32F7X2 (Config.:FLYCOLORF7)
- FC board:FLYCOLORF7.
- MCU:STM32F722.
- Gyro : MPU-6000 SPI.
- Bluetooth: FC_Bluetooth.
- USB: Type C.
- Supports SBUS,SPEKTRUM1024/2048 etc. remote control / receiving mode.
- FC integrated 3.3V,5V, 12V for receiver, VTX, camera, buzzer, LED and other peripheral devices.
- 4-way led port, independent 5V BEC power supply, making the power supply more safe and reliable.
- Supports Betaflight Configurator to adjust the LED color.
- Install holes:30.5x30.5mm,M3.

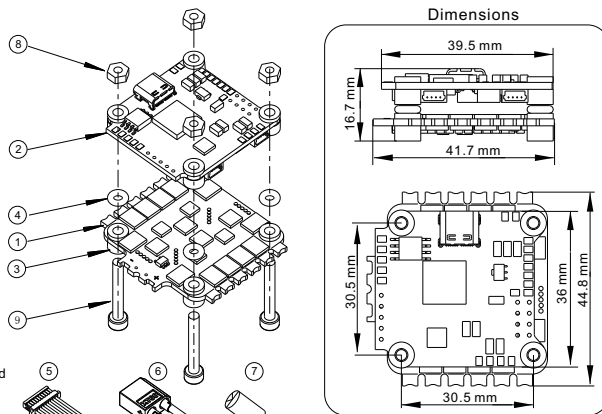


02 Specifications

Model	Con. Current (Good heat dissipation)	Burst Current (10S)	F.C Vout	LiPo cells	Weight (Without accessories)	Size (For reference)	Typical Applications (For reference)
X-Tower 2-60A	60A	70A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	210-550 Multi
X-Tower 2-45A	45A	55A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	170-450 Multi
X-Tower 2-30A	30A	40A	3.3V/5V/10V	3-6S	26g	41.7x44.8x16.7mm	170-210 Multi

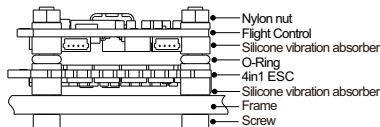
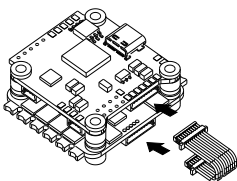
03 Part list / Install Dimensions and Diagram

Item	Description	Qty.
①	32Bit 4in1 ESC	1
②	F7 Flight Control	1
③	Silicone vibration absorber	8
④	O-Ring	4
⑤	ESC /FC connecting wire (2x10p SH1.0)	1
⑥	Power wire(XT60)	1
⑦	Electrolytic capacitor *	1
⑧	Nylon nut	4
⑨	Screw	4



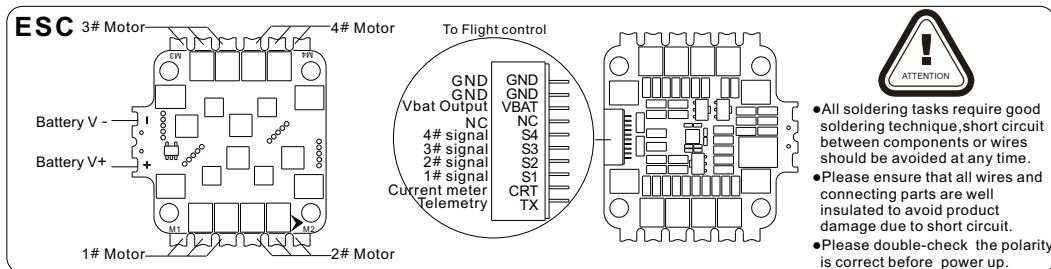
*To enhance performance of filtering, users can solder the electrolytic capacitor which are included in the accessory pack to the positive and negative terminals.

*All pictures are for reference only

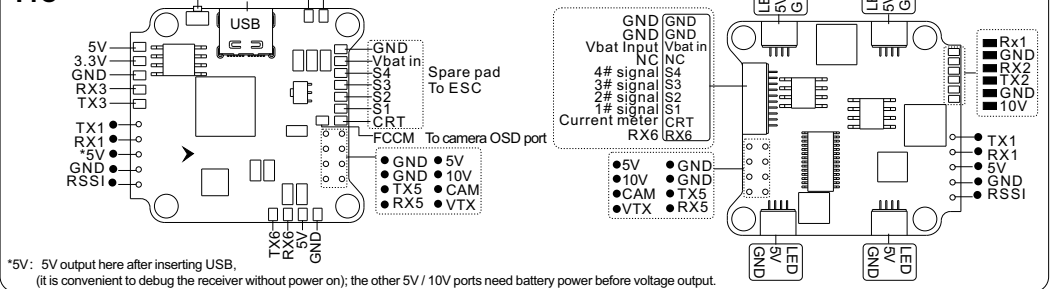


- Please use the parts supplied with the product for installation. Please ensure enough safety space between the ESC & Drone frames, as short circuit will damage the product.
- Please use the wire supplied with the product for connecting. If there is any change, before connecting, make sure your connecting wire is in correct order to avoid product damage

04 Connect diagram of ESC and FC



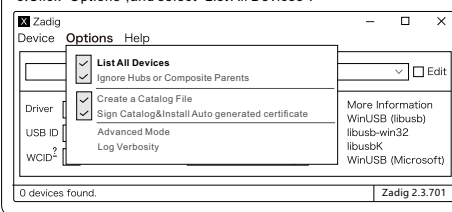
F.C



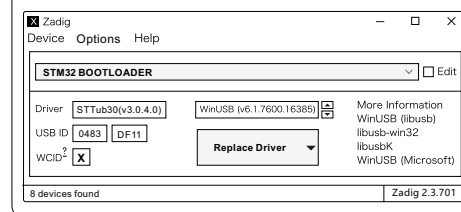
05 Load firmware for FC

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".

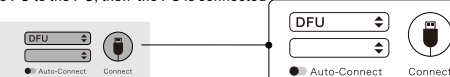


4. Then select "STM32 BOOTLOADER", Then click "Replace Driver"
5. Close the Zadig software tool when replace successfully, Then disconnect the FC from the PC.



(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; 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 load the firmware;



7. You can load the firmware online or local :

- 1) Local (recommended, it needs to download in advance or ask for Flycolor): First load the STM32f7x2.hex file, then connect and input the contents of FLYCOLORF7.config file in the CLI, and enter "save".
- 2) Online: Select FC board FLYCOLORF7, 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 .
- The Bluetooth port is fixed as MSP of UART4;
- SBUS and Spektrum receivers are applicable to all UART ports (except UART4, which is fixed to Bluetooth). It is required to manually turn on the "Serial RX" of the required UART port;
- UART6 is recommended for telemetry port, which can be directly connected with ESC / flight control connecting wire;
- 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
- 5V ,10V supply is for low-current use only(5V 3A MAX, 10V 1.5A MAX).
- ESCs use BLHeli-32 firmware, please don't load any other firmware except "Flycolor_X_Cross_BL_32".
- 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.
- Please contact Flycolor sales or technical support for more information.