# HOBBYWING®

Thank you for purchasing this product! Please read the following statement carefully before use and, once used, it is considered to be an acceptance of all the contents. Please strictly observe and adhere to the manual installation with this product. Unauthorized modification may result in personal injury and product damage. We reserve the rights to update the design and performance of the product without notice.

X-Rotor Pro

H80A-14S-BLDC-RTF-HW-V2

USER MANUAL
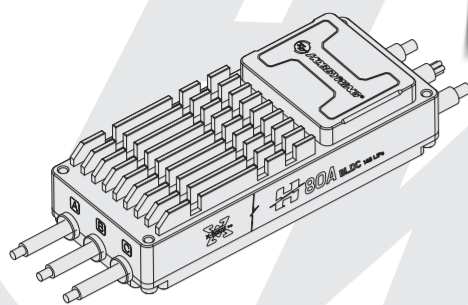
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01 Precaution

- Before connecting ESC to the related components, please ensure that all contact terminals are well insulated to prevent short circuit from damaging the ESC.
- Ensure proper connection for the aircraft to operate normally and prevent unpredictable damage to the equipment.
- Before using this ESC, please review the manual to ensure that the power system is correctly matched to avoid damage to the ESC due to wrong connectivity.
- Use only hi-power soldering station that is reliable for soldering work on the ESC.
- Do not use it when the external ambient temperature exceeds 65°C. The high temperature will destroy the ESC and may cause damage to the motor, and cause the machine to explode
- If you need to change the direction of rotation of the motor, you can change the sequence of any two-phase wires.
- The ESC is equipped with CAN function. When using the CAN function, the ESC ID and the throttle channel of the same aircraft cannot be the same, otherwise, the multiple ESCs will be recognized as the same.
- The ESC doesn't have the CAN terminal resistor.

02 Feature of product

- Multi-rotor dedicated core program, the throttle response speed is greatly improved.
- A built-in memory chip that records the ESC running data in real time and provides the black box function.
- This ESC is equipped with nano-coating technology with a protection level of IP55, and IP67 can be customized.
- The microprocessor is powered by an independent voltage regulator IC, which has better anti-interference ability and greatly reduces the possibility of control loss.
- Uses shielded wires to improve anti-interference, shield external and self-interference, and improves signal quality.
- BLDC square wave drive technology, good compatibility, a program can be compatible with a variety of motors.
- Using CAN communication, the input and output throttle, motor speed, bus current, bus voltage, capacitor temperature, MOS temperature, ESC status and other data can be monitored in real time. The communication protocol can be obtained by contacting Hobbywing.
- The factory default settings can meet the requirements of most applications with automatically adjustable timing, and is highly intelligent.
- Compatible with various flight controllers and throttle signals with a refresh rate of 50~500Hz.
- Using DEO (Driving Efficiency Optimization) drive technology, it has better throttle linearity and higher drive efficiency.
- You can use DataLink (optional) to upgrade the ESC program. For details, refer to the Datalink instruction manual or contact the manufacturer.
- Support flight controller upgrade ESC firmware. (Requires the use of flight controller)
- Throttle pulse width 1100-1940μs, solidified pulse width, not calibrated.

03 Product specification

Model	Continuous current Cooling wind speed 7m/s	Specification	BEC	Number of lithium battery cells (Standard voltage 3.7V)	Parameter options	Weight (without wire)	volume (mm)
XRotor Pro-H80A-14S-BLDC-RTF-HW-V2	40A	80A	None	6-14S	Unable to change parameters	87g	84 x 35 x 20

04 User Guide

Warning! The DEO function of is default turned on, and closing the throttle has a braking effect and reverse-series voltage. Please do not use a power supply device that cannot absorb reverse-series voltage for ESC testing, otherwise the ESC and power supply will be damaged.

Battery

Electronic Speed Controller

Receiver

UBEC

Motor
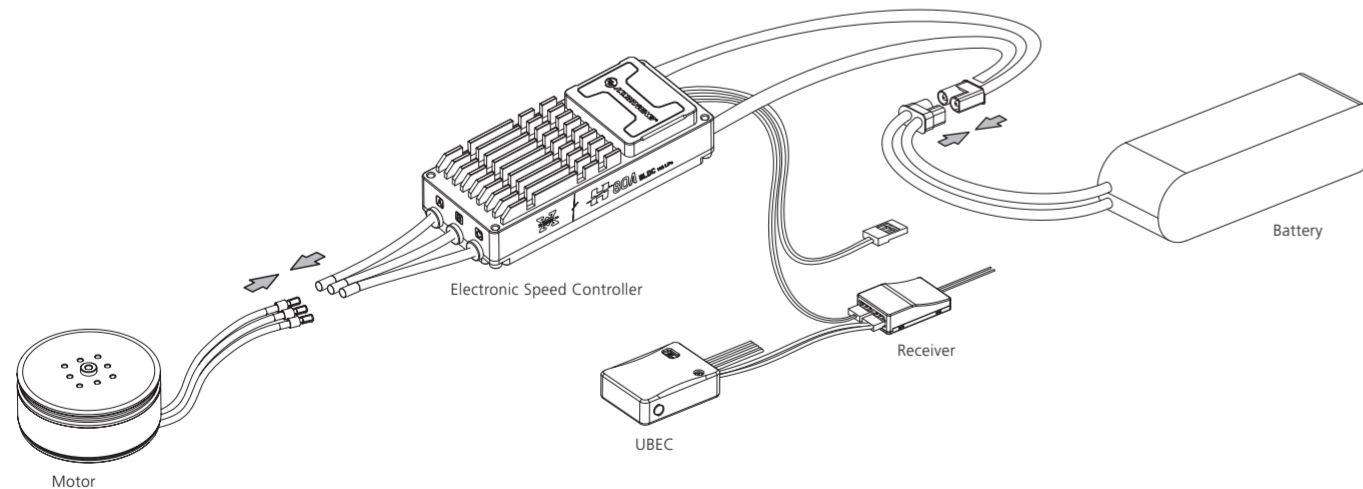
- The black and white wires are the ESC throttle signal cable, the black wire is the GND, and the white wire is the throttle signal wire;
- The yellow, gray and green wires are the ESC data cable and upgrade cable, using CAN bus communication, the yellow wire is the GND, the gray wire is CH, and the green wire is CL;
- The CAN cable is also a digital throttle cable and can be used in parallel.

05 Normal boot process

Turn on the remote control, push the throttle stick to the lowest point.

Connect the system to the battery, and the motor will beep "♪123", indicating that the power system is ready, the self-test is over, and you can take off at any time.

06 Protection function description

This ESC is specially designed for industrial drones without low-voltage protection and over-heat protection.

1) Start protection:
   When the motor fails to start normally within two seconds after pushing the accelerator, the ESC will shut down and the throttle stick must be placed at the lowest point again before it can be restarted. (The reason for this may be poor connection between the ESC and the motor or disconnected individual output wires, motor stalled, propeller blocked, etc.).

2) Stall protection:
   When the ESC detects that the motor is blocked, the ESC will completely turn off the output and repeatedly try to restart the motor. If failed restart, please check the faults. The power output can only be resumed after the power is turned off and restarted, and the fault is eliminated.

3) Current protection:
   When the instantaneous phase current is over 400A, the ESC will turn off the output and keep trying to restart the motor. If the motor does not restart, it will return to normal after power on again.

4) Over-heat warning:
   This ESC has no over-heat protection. The warning will be sent through the data interface when temperature is too high and when it is more than 110°C. When the temperature of the ESC is higher than 130°C, electronic components may be damaged. Please land the aircraft immediately or reduce the throttle output.

5) Low voltage protection:
   This ESC has no low-voltage protection. Some electronic components of the ESC will work abnormally when the voltage falls below 18V. Please land the aircraft immediately.

6) Throttle signal loss protection:
   When the ESC detects that the throttle signal is lost, the output will be turned off immediately to avoid greater losses caused by the continued high-speed rotation of the propeller. After the signal is restored, the ESC will resume normal operation immediately.

07 ID setting

If there is no requirement, the default factory ID of the ESC is 1, the throttle channel is 1, and the bus speed is 500KHz.
This function requires the additional purchase of DataLink data box.
Before using this function, ensure that the computer system has installed Microsoft Visual C++ 2013 software in advance, otherwise it cannot operate normally.
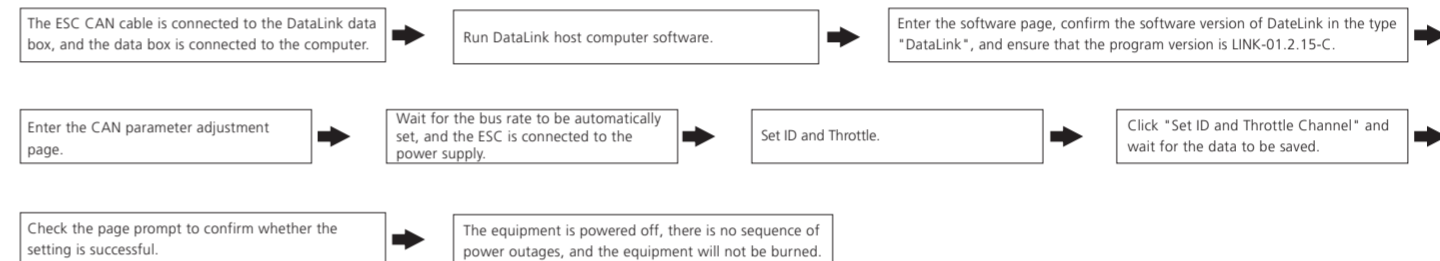
1) Connection
   ESC---->DataLink data box "yellow gray green"---->"—CH1 CL1";
   Connect the data box to the computer via USB.
   When changing the ID, please remove the paddle to avoid danger.
   For the same aircraft, different ESC IDs and throttles cannot be the same to avoid same ID recognizing as one ESC when using CAN function.

2) Operating diagram

The ESC CAN cable is connected to the DataLink data box, and the data box is connected to the computer.	Run DataLink host computer software.	Enter the software page, confirm the software version of DateLink in the type "DataLink", and ensure that the program version is LINK-01.2.15-C.
Enter the CAN parameter adjustment page.	Wait for the bus rate to be automatically set, and the ESC is connected to the power supply.	Set ID and Throttle.
Check the page prompt to confirm whether the setting is successful.	The equipment is powered off, there is no sequence of power outages, and the equipment will not be burned.	

Click "Set ID and Throttle Channel" and wait for the data to be saved.

08 Firmware upgrade

Firmware upgrade is divided into two ways: computer online upgrade and flight controller remote upgrade. It supports online upgrade of multiple ESCs at the same time, and the upgrade port is CAN-ESC (Fast).
The flight control upgrade requires the use of flight control, and is not explained here.
This function needs to use DataLink data box, special DataLink software for upgrade package, and USB data cable.
DataLink data box version requirements, LINK-01.2.15-C or later; DataLink software can be obtained from Hobbywing official website, distributors, Hobbywing sales, and Hobbywing after-sales.

Note: Before using this function, please ensure that the computer has installed Micosoft Visual C++ 2013 software, otherwise it cannot be used. An upgrade package usually only contains one program for one ESC. For other ESCs, please obtain a new upgrade package. For details, please refer to the DataLink user manual.

1) Connection
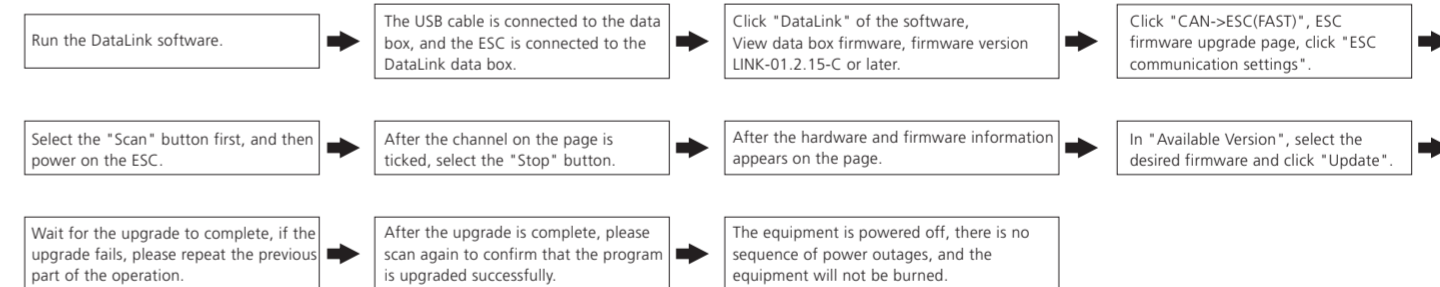   Connect the computer and the DataLink data box with the USB data cable.
   ESC---->DataLink data box "yellow gray green"---->"—CH1 CL1".

2) Firmware acquisition
   It can be obtained at the place of purchase, Hobbywing official website, dealers, Hobbywing sales and Hobbywing after-sales offices.
   Note: It can only be upgraded from the existing program, and software and hardware cannot be upgraded together.

3) Operating diagram

Run the DataLink software.	The USB cable is connected to the data box, and the ESC is connected to the DataLink data box.	Click "DataLink" of the software, View data box firmware, firmware version LINK-01.2.15-C or later.	Click "CAN->ESC(FAST)", ESC firmware upgrade page, click "ESC communication settings".
Select the "Scan" button first, and then power on the ESC.	After the channel on the page is ticked, select the "Stop" button.	After the hardware and firmware information appears on the page.	In "Available Version", select the desired firmware and click "Update".
Wait for the upgrade to complete, if the upgrade fails, please repeat the previous part of the operation.	After the upgrade is complete, please scan again to confirm that the program is upgraded successfully.	The equipment is powered off, there is no sequence of power outages, and the equipment will not be burned.	

09 Common Faults and Prompt Sound Description

Warning tone description.

SYMPTOM	TONE	POSSIBLE CAUSES	POSSIBLE SOLUTIONS
Motor fails to start after power on	"Beep beep beep" rapid monotone	Throttel is not reset to zero	Push the throttle to the lowest point or recalibrate the throttle point.
Motor fails to start after power on	"Beep, Beep, Beep" (1 second for each interval)	No throttle signal input on the receiver throttle channel.	Check if transmitter and receiver is normal. Check if wiring of throttle channel is normal.
The power-on voltage is lower than18 V	"Beep, Beep, Beep" (1 second for each interval)	Battery voltage is too low.	Replace with a full-charged battery.
The power-on voltage is higher than 65 V	"Beep, Beep, Beep" (1 second for each interval)	Battery volatage is too high.	Replace with a suitable and fully-charge battery.
Motor stops or restarts during operation		Motor is not compatible with the ESC.	Replace motor, or propeller.
No sound during self-test, motor is operating	No sound during self-test, motor is operating	Abnormal drive.	1. Replace ESC; 2. Return to factory for repair.
Motor fails to start normally, accompanied by "jam" vibration	No sound during self-test, motor is not operating	Loss of motor phase.	1. Check phase connection; 2. Check motor; 3. Return to factory for repair.

感谢您购买本产品！无刷动力系统功率强大，错误的使用可能导致人身伤害或者设备损坏，为此我们强烈建议您在使用设备前仔细阅读本说明书，并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。

06 保护功能说明

本电调专为行业无人机设计，无低压保护、无过温保护。

1）启动保护：
当加大油门后两秒内未能正常启动马达，电调将关闭动力输出，油门摇杆需再次置于最低点后才可以重新启动。（出现这种情况的原因可能是：电调和马达连线接触不良或有个别输出线断开、电机堵转、螺旋桨被阻挡等）。

2）堵转保护：
当电调检测到电机发生堵转时，2秒后电调会彻底关闭输出并重复尝试重启电机，如果电机重新启动失败，请仔细排查故障，并重新上电后才能恢复动力输出。

3）电流保护：
当瞬间电流异常并超过400A时，电调会关闭输出并一直尝试重启电机，若使电机多次重启失败，重新上电后可恢复正常。

4）过温警告：
当MOS温度高于110°C或者电容温度大于100°C时，会通过数据接口向外发送过温故障信息。当电调报过温故障时，如果温度继续上升，可能导致电子元器件损坏，请及时降落飞行器或者减少油门输出。

5）低压保护：
电调无低压保护，当电压低于18V后，电调部分电子元器件会工作异常，请及时降落飞行器。

6）油门信号丢失保护：
当电调检测到油门信号丢失将立即关闭输出，以免因螺旋桨继续高速转动而造成更大的损失。信号恢复后，电调也随即恢复正常工作。

07 ID设置

在无要求的情况下，电调默认出厂ID为1，油门通道为1，总线速率为500KHz。
此功能需要另购DataLink数据盒子才能使用。
在使用此功能前，保证电脑系统提前安装了Microsoft Visual C++ 2013 软件，否则无法正常操作。

1）连线
电调--->DataLink数据盒子 "黄 灰 绿"---->"— CH1 CL1"；
USB连接数据盒子到电脑。
更改ID时请将桨拆卸下来，避免危险发生。
同一架飞机，不同的电调ID和油门不能相同，否则使用CAN功能时，相同ID的不同电调会被识别成一个电调。

2）操作

| 电调CAN线连接到DataLink数据盒子上，数据盒子连接到电脑。 | ➡ | 运行DataLink上位机软件。 | ➡ | 进入软件页面，在类型的"DataLink"处确认DateLink的软件版本，保证程序版本在LINK-01.2.15-C。 | ➡ |

| 进入CAN调参页面。 | ➡ | 等待总线速率自动设置完成，电调接入电源。 | ➡ | 设置ID和油门。 | ➡ | 点击"设置ID及油门通道"，等待数据保存。 |

| 查看页面提示，确认设置是否成功。 | ➡ | 设备断电，断电无先后顺序，亦不会烧坏设备。 |

08 固件升级

固件升级分为电脑在线升级和飞控远程升级两种方式，支持同时多个电调在线升级，升级口为CAN-ESC(Fast)。
飞控升级需飞控配合，此处不做说明。
此功能需使用DataLink数据盒子，升级包专用DataLink软件，USB数据线。
DataLink数据盒子版本要求，LINK-01.2.15-C或更高版本；DataLink软件可在好盈官网、经销商、好盈销售、好盈售后获取。
注：使用此功能前请保证电脑已安装Micosoft Visual C++ 2013 软件，未安装无法使用。一个升级包只会通常只含有1款电调的一个程序，其它电调，请重新获取新的升级包。详情请参照DataLink使用手册。

1）连线
USB线连接电脑和DataLink数据盒子；
电调----->DataLink数据盒子 "黄 灰 绿"---->"— CH1 CL1"；

2）固件获取
可在购买处获取，好盈官网、好盈销售、好盈售后获取。
注：只能从已有的程序里升级，不能软件和硬件一起升级。

3）操作

| 运行DataLink软件。 | ➡ | USB线连接数据盒，电调连接DataLink数据盒。 | ➡ | 点击软件的"DataLink"，查看数据盒子固件，固件版本LINK-01.2.15-C或更高版本。 | ➡ | 点击"CAN->ESC(FAST)"，电调固件升级页面，点击"电调通讯设定"。 |

| 先选择"扫描"按键，再给电调通电。 | ➡ | 待页面的通道上有打钩提示后，选择"停止"按键。 | ➡ | 待页面上出现硬件、固件信息后。 | ➡ | 在"可用版本"处，选择需要的固件，点击"更新"。 |

| 等待升级完成，若升级失败，请重复前部分操作。 | ➡ | 升级完成后，请再次扫描，确认程序升级成功。 | ➡ | 设备断电，断电无先后顺序，不会烧坏设备。 |

01 注意事项

· 电调与相关部件连接前，请确保所有接触端绝缘良好，短路会毁坏电调。
· 请务必仔细连接好各部件，若接触不良，您可能无法正常控制飞行器，或出现设备损坏等其他不可预知的情况。
· 使用此电调前，请认真查看电调以及电机说明书，确保动力系统搭配合理，避免错误的搭配导致损害电调。
· 若需对电调的输入、输出线插头做相关焊接，请保证焊接牢靠，并使用足功率的焊接设备。
· 勿使电调外部环境温度超过65℃，高温将会毁坏电调并且可能导致电机损害造成炸机。
· 若需改变电机工作时的转向，可更改任意两根相线次序。
· 本电调拥有CAN功能，在使用CAN功能时，同一架飞机，电机ID和油门通道不能相同，否则多电调会被识别为同一个。
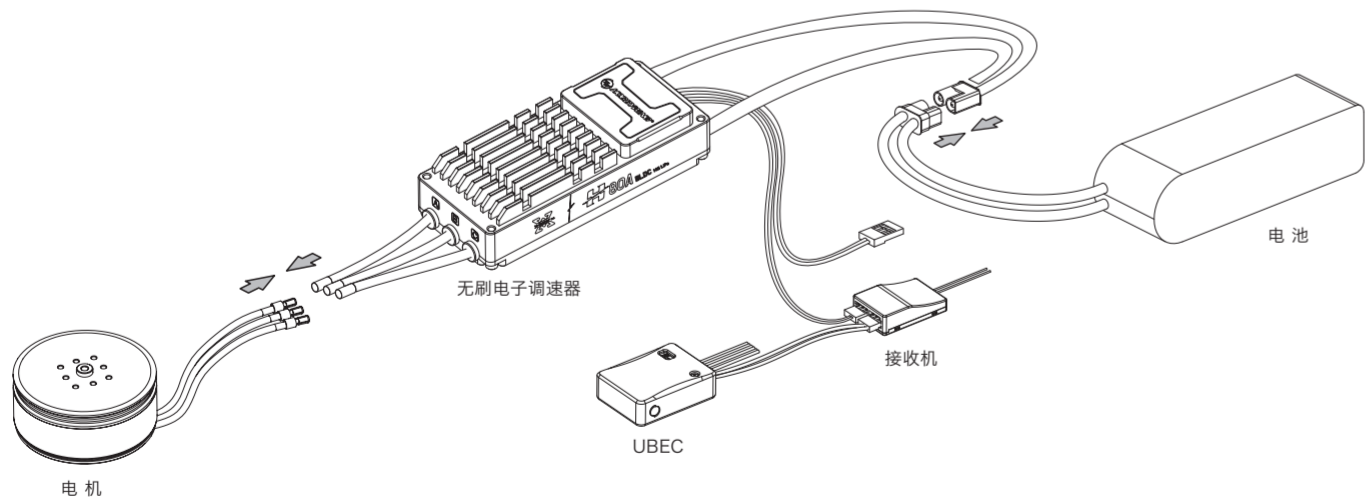· 电调出厂默认不带CAN终端电阻，需整机进行统一匹配。

02 产品特色

· 多旋翼专用核心程序，油门响应速度大幅提升。
· 内置存储芯片，实时记录电调运行数据，具备黑匣子功能。
· 本电调采用纳米镀膜工艺，防护等级IP55，可定制IP67。
· 微处理器采用独立的稳压IC供电，具有更好的抗干扰能力，大幅降低失控的可能性。
· 使用屏蔽线，提升抗干扰能力，屏蔽外界和自身干扰，保证信号质量。
· BLDC方波驱动技术，兼容性好，一个程序可兼容多款电机。
· 采用CAN通信，输入与输出油门、电机转速、母线电流、母线电压、电容温度、MOS温度、电调状态等数据实时掌握，通信协议可联系好盈官方获得。
· 自动调节进角，高度智能化，使用出厂默认设置即可满足绝大多数应用要求。
· 兼容刷新频率为50~500Hz的油门信号，兼容多种飞控。
· 使用DEO（Driving Efficiency Optimization）驱动技术，具备更好的油门线性及更高的驱动效率。
· 可使用DataLink（选购）升级电调程序，具体参考Datalink使用说明书或联系厂家。
· 支持飞控升级电调固件。（此功能需飞控配合）
· 油门脉宽1100-1940μs，固化脉宽，不可校准。

03 产品规格

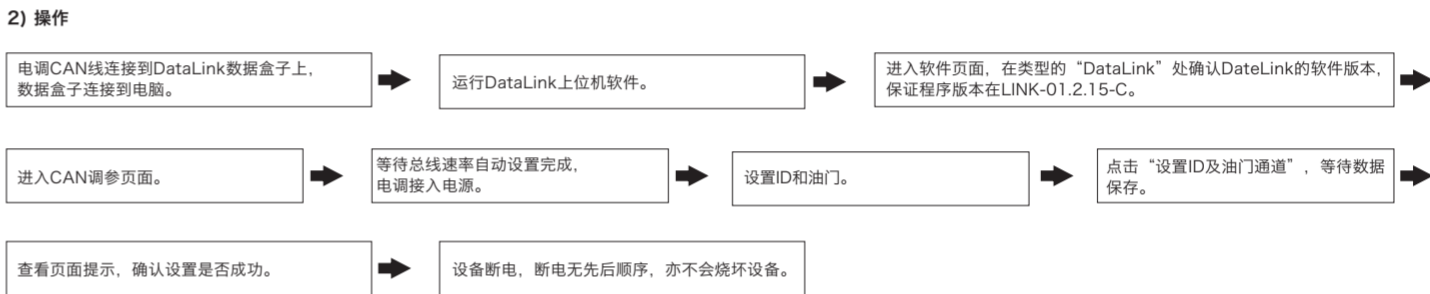| 型号	持续电流散热风速7m/s	规格	BEC	锂电节数(标压3.7V)	参数选项	重量(不含线)	外观尺寸(mm)
XRotor Pro-H80A-14S-BLDC-RTF-HW-V2	40A	80A	无	6-14S	DEO（开/关）	87g	84 x 35 x 20

04 使用向导

警告！电调默认开启DEO功能时收油门具有刹车效果和反串电压，请勿使用不能吸收反串电压的电源设备进行电调测试，否则会损坏电调和电源。

电池

无刷电子调速器

接收机

UBEC

电机

⚠ · 黑白两色排线为电调油门信号线，黑线为地线、白色为油门信号线；
· 黄绿灰三色线为电调数据线和升级线，使用CAN总线通信，黄线为地线、灰色为CH、绿色为CL；
· CAN线也是数字油门线，可以并联使用。

05 正常开机过程

开启遥控器，将油门摇杆打到最低点。 ➡ 将系统接上电池，马达发出鸣叫"♪123"，表示动力系统准备就绪，自检结束，随时可以起飞。

09 常见故障及提示音说明

警示音说明

故障现象	警报音	可能原因	解决办法
上电后电机无法启动	"哔哔哔…"的急促单音	油门未归零	将油门打至最低点或重新校准油门行程
上电后电机无法启动	"哔、哔、哔、……"（每个间隔1秒）	接收机油门通道无油门信号输出	1. 检查发射机与接收机配合是否正常 2. 检查油门控制通道接线是否正常
上电电压低于18V	"哔哔、哔哔"（间隔1秒）	电池电压过低	更换合适的满电电池
上电电压高于65V	"哔哔、哔哔"（间隔1秒）	电池电压过高	更换合适的满电电池
空中电机停转或者重启		电机与电调不兼容	更换电机、或者更换桨叶
电机自检时没有声音，电机能转动	自检无提示音，电机能旋转	驱动异常	1. 更换电调 2. 返厂维修
电机无法正常启动，伴随"咔咔"的抖动	自检无提示音，电机不能旋转	电机缺相	1. 检查相线连接 2. 检查电机 3. 若电机、连线无问题，电调返厂维修