FLYFANS

风范40A无刷电子调速器说明书

安全须知

检验无线电接收装置上的正确设置，第一次测试电调和马达时不要在马达上安装螺旋桨或传动小齿轮。只有当您确认了无线电接收装置上的设置正确后方能安装螺旋桨或传动小齿轮。

- 不要使用裂开或被刺破的蓄电池组电压。
- 不要使用会变得过热的电池组。
- 不要使用短路电池或马达接线端。
- 电缆绝缘要用正确的绝缘材料。
- 使用正确的电池连接器。
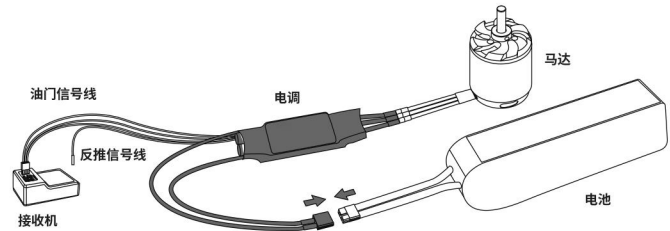- 电池或伺服系统的数量不要超过电调的规定。
- 错误的电池极性会损坏电调。

主要特性

1. 功率输出元器件(MOSFET)选用新一代的制作工艺，发热低，瞬间承受电流大，可靠性高。
2. 高性能32位处理器，运算能力更强，运行速度更快。
3. 超流畅的启动与精准的油门线性度。
4. 效率高，电调更节能，续航时间更长。
5. SBEC 5V/6V两档可调，持续8A电流供应，给舵机提供更强劲的动力(40A/50A/60A/80A/100A具有SBEC可调)。
6. 多重保护：启动保护，过温保护，低压保护，缺相保护，信号丢失保护。
7. 自动识别马达进角，支持高RPM马达，可兼容市面上绝大多数马达。
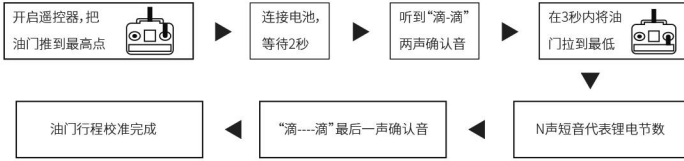8. 支持手机App或LCD编程，操作更简单方便(需单独购买ZTW蓝牙模块或LCD编程卡)。

产品规格

型号	PN#Model	持续/瞬时电流(A)	输入电压	重量(g)	BEC输出	尺寸(mm)长*宽*高	是否支持编程
Beatles 20A SBEC G2	3020211	20A/30A	5-12NC/2-4Lipo	25	5.5V/4A	60*25*10	是
Beatles 30A SBEC G2	3030211	30A/40A	5-12NC/2-4Lipo	25	5.5V/4A	60*25*10	是
Beatles 40A SBEC G2	3040211	40A/55A	5-12NC/2-4Lipo	37	5V/6V 4A	68*25*10	是
Beatles 50A SBEC G2	3050211	50A/65A	5-12NC/2-4Lipo	37	5V/6V 4A	68*25*10	是
Beatles 60A SBEC G2	3060211	60A/80A	5-18NC/2-6Lipo	50	5V/6V 8A	70*34*10	是
Beatles 80A SBEC G2	3080211	80A/100A	5-18NC/2-6Lipo	75	5V/6V 8A	90*37*10	是
Beatles 100A SBEC G2	3100211	100A/120A	5-18NC/2-6Lipo	80	5V/6V 8A	90*37*10	是

调速器连接线说明 (线连接用热缩管收缩使其绝缘，避免短路烧毁调速器)

油门信号线
反推信号线
接收机
电调
马达
电池

首次使用电调并设置油门行程

温馨提示：在首次使用本电调或更换其他遥控器使用时，请务必先重新设定油门行程。

开启遥控器，把油门推到最高点 ▶ 连接电池，等待2秒 ▶ 听到"滴-滴"两声确认音 ▶ 在3秒内将油门拉到最低

油门行程校准完成 ◀ "滴----滴"最后一声确认音 ◀ N声短音代表锂电节数

电调的正常启动程序

开启遥控器，将油门拉到最低点 ▶ 将电调上电，等待2秒 ▶ 听到N声短音，代表锂电节数

电调准备就绪 ◀ 自检完成，发出"滴--滴"确认音
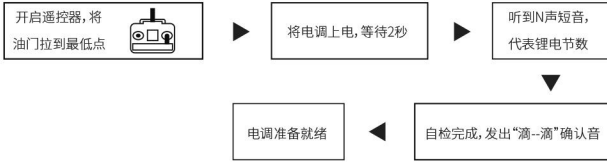
编程项简要说明(黑体字为出厂默认值)

1. SMR功能：**关闭**/打开
   通过切换电机正反向，快速停止。出厂默认是关闭，此时1Pin信号线完全无效。如需打开，通过App设置或遥控器编程打开SMR功能，将3Pin信号线接入油门通道，将1Pin信号线接入接收机任意的2段开关通道，打开遥控器2段开关，此时SMR功能开启，拨动遥控器2段开关即可调整电机正反向。
   ⚠️ 警告：此功能只能在50%油门以下才有效，且只允许在飞机降落到地面使用，否则有可能引起电调烧毁！

2. 刹车力度：**关闭**/软/中度/最大

3. 进角：**自动**/低/中/高 (分别为5度/15度/25度)

4. 马达方向：**正向**/反向
   正向：电机默认旋转方向
   反向：将电机旋转方向更改

5. SR功能：打开/**关闭**
   效率更高，更节能，续航时间更长

6. 锂电节数：**自动**/2S/3S/4S/5S/6S

7. 低压保护点：**3.0V**/3.2V/3.4V/3.6V
   例如：使用3节锂电，设定为3.0V为低电压保住值，则低压保护阈值为：3*3.0 = 9.0V

8. 保护方式：**降低功率**/立即关断
   降低功率：当达到预设的低压保护阈值时，电调减少输出功率至70%
   立即关断：当达到预设的低压保护阈值时，电调立即关断输出功率

9. BEC：**5V**/6V
   40A、50A、60A、80A、100A电调BEC电压输出可设置5V/6V

10. 加速度：**普通**/柔和

电子调速器编程设置模式

首先将遥控器油门拉杆推至最高位置，打开遥控器电源，将电池组连接到调速器，2秒后电机"滴-滴滴"声响，停3秒，发出123特殊声音，表示进入编程模式。设置音按以下顺序滚动播放：

1). "嘀"   SMR功能   (1短音)
2). "嘀.嘀"   刹车力度   (2短音)
3). "嘀.嘀.嘀"   进角   (3短音)
4). "嘀.嘀.嘀.嘀"   马达转向   (4短音)
5). "嘀—"   SR功能   (1长音)
6). "嘀——嘀"   电池节数   (1长1短音)
7). "嘀——嘀.嘀"   低压保护值   (1长2短音)
8). "嘀——嘀.嘀.嘀"   电压保护类型   (1长3短音)
9). "嘀——嘀.嘀.嘀.嘀"   BEC输出   (1长4短音)
10). "嘀——嘀.—"   加速度   (2长音)
11). "嘀——嘀.嘀.—滴"   恢复出厂默认   (2长音1短音)

注：一声长嘀相当于五声短嘀。
在听到某个提示音后，2S内将油门摇杆打到最低，则进入该设定项，马达会循环鸣叫，在鸣叫某个提示音后将油门摇杆打到最高点，则选择该提示音所对应的设定值，接着会听到123特殊确认音，表示设置成功。

例如：设置马达转向，听到"滴滴滴滴"四短音，表示进入马达转向菜单，在2S内将遥控器油门打到最低，听到"滴"一短音代表正向(CW)，"滴滴"两短音代表反向(CCW)，如想设置为反向(CCW)，则在听到"滴滴"两短音时将油门拉杆打到最高，会听到123特殊确认音，表示设置成功，2秒内将油门拉杆打到最低位置。(如果听到确定音之后，超过2秒油门仍在最高位，则重新进入编程模式)重复以上操作，设置您所需要的各种功能。

退出设定：参数设置成功后，立即将油门拉杆打到最低位置，即表示退出设定。

编程参数表

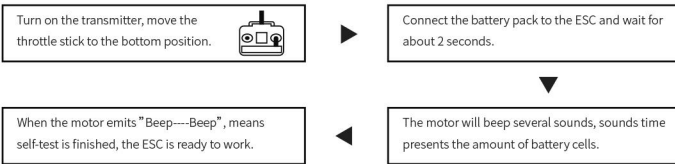| 提示音 设定项	"嘀"1短音	"嘀.嘀"2短音	"嘀.嘀.嘀"3短音	"嘀.嘀.嘀.嘀"4短音	"嘀—"1长音	"嘀—嘀"1长1短音	"嘀—嘀.嘀"1长2短音
SMR功能	关闭	打开					
刹车力度	关闭	软刹车	中度刹车	最大刹车			
进角	自动	低	中	高			
马达转向	正向(CW)	反向(CCW)					
SR功能	打开	关闭					
电池节数	自动	2S	3S	4S	5S	6S	
低压保护值	关闭	NIMH 50%	NIMH 60%	3.0V	3.2V	3.4V	3.6V
电压保护类型	降低功率	立即关断					
BEC输出	5V	6V					
加速度	普通	柔和					
恢复出厂默认	复位						

❶ 注：灰颜色为出厂默认选项参数。

保护功能

1. 启动保护：当推油门启动后，如在两秒内未能正常启动电机，电调将会关闭电机，油门需要重新设置，才可以重新启动。可能原因：电调与电机接线断开或接触不良、螺旋桨被其他物体阻挡、减速齿卡死等。

2. 温度保护：当电子调速器工作温度超过110度时，电调将自动降低输出功率进行保护，但不会将输出功率全部关闭，最多降至全功率的70%，以保证电机留有一定动力，避免摔机。

3. 油门信号丢失保护：当电调检测到油门信号丢失1秒后，将自动减少对马达的输出功率，然后油门信号丢失超过2秒，电调将自动关断马达，如果在降功率过程中油门信号恢复，电调可以立即恢复受油门控制。这样在瞬间信号丢失情况下(2秒以下)，电调并不会进行油门保护；只有当遥控信号确实长时间丢失，才进行保护，但电调不是立即关断输出，而是有一个逐步降低输出功率的过程，给玩家留有一定的救机时间，兼顾安全性和实用性的。

4. 过负荷保护：当负载突然变得很大时，电调会切断动力，或自动重启，出现负载急剧增加的原因通常是马达堵转。

常见问题解答

出现的问题	可能的原因	解决方法
接通电调后有自动检测电池节数声音，但马达不能启动	电调没有油门行程设置	对电调进行油门行程设置
马达不工作，连接电池后马达未发音乐声，伺服系统也不运行	电池组与电调之间接触不良没接通电源 焊接不牢固(接头易断) 电池电缆极性错误 电调信号线与接收机连接极性相反 电调有问题	清理连接器终端或替换连接器 用刚充满电的电池组替换 再次焊接电缆连接 检查并确认电缆极性 检查连接在电调上的信号线以确保处于正确极性 更换电调
马达不工作，连接电池后马达未发出音乐声，但伺服系统在运行通电通电后马达不工作，发出警报音(两声滴滴响后有短暂停顿)	电调与马达之间接触不良 马达线圈被烧 焊接不牢固(接头易断) 电池组电压超出正常范围	检查连接器终端或替换连接器 替换马达 再次焊接电缆连接 更换为刚充满电的电池组 检查电池组电压
接通电调后马达不工作，发出警报音(持续地滴滴响)	通电后油门拉杆不在最小位置	将油门拉杆移至最小位置
接通电调后马达不工作，电调发出两声长响之后，有两声更长点的滴滴响	被颠倒的油门通道导致电调进入程序设计模式	进入发射器上的伺服系统倒转菜单并倒转油门通道
马达反向运行	电调与马达之间错误的电缆连接	交换电调与马达之间三条电缆连接中的任意两条或者通过电调程序设计模式进入马达旋转功能时并改变预设参数。
飞行过程中，马达停止运行	丢失了油门信号	检查无线电接收装置是否操作得当。检查电调和接收机信号线路及发送频道和电调信号线之间确保有足够的隔离来防止干扰 在电调的信号线上安装一个磁环

NORMAL STARTUP PROCEDURE

Turn on the transmitter, move the throttle stick to the bottom position. ▶ Connect the battery pack to the ESC and wait for about 2 seconds.

When the motor emits "Beep----Beep", means self-test is finished, the ESC is ready to work. ◀ The motor will beep several sounds, sounds time presents the amount of battery cells.

PROGRAMMING ITEMS(The option written in bold font is the default setting)

1. SMR Function: **OFF**/ON
This function supports switching the motor rotation to decelerate when the airplane landing to the ground.
The factory default is OFF, the 1Pin signal wire is completely invalid at this time.
If you need to turn it on, using Phone App or transmitter to program it "ON", plug the 3Pin signal wire into the throttle channel, and plug the 1Pin signal wire into any 2-stage switch channel of the receiver, then turn on the transmitter 2-stage switch. The SMR function is turned on now, you can change the forward and reverse directions of the motor by flipping the 2-stage switch of the transmitter.
Warning: This function can only be effective when the throttle is below 50%, and it is only allowed to be used when the airplane is landing on the ground, otherwise it may cause the ESC to burn!
2. Brake Type: **OFF**/Soft/Mid/Hard
3. Timing: **Auto**/Low/Mid/High(5°/15°/25°)
4. Motor Rotation: **CW**/CCW
5. SR function: ON/**OFF**
The synchronous rectification function makes ESC with higher driving efficiency and more energy-saving.
6. Battery cells: **Auto**/2S/3S/4S/5S/6S
7. Low Voltage Cutoff Threshold: OFF/NIMH50%/NIMH60%/**3.0V**/3.2V/3.4V/3.6V
For example: using 3 lithium batteries and setting 3.0V as the low voltage cutoff value, then the low voltage protection threshold is: 3*3.0 = 9.0V
8. Low Voltage Cutoff Type: **Reduce Power**/Cut Off Power
Reduced power: When the voltage drops to the set low-voltage protection threshold, the ESC will reduce power to 70%.
Cut Off power: When the voltage drops to the set low-voltage protection threshold, the ESC will cut off the power immediately.
9. 40A、50A、60A、80A、100A ESCs have adjustable SBEC 5V/6V, the default set is **5.0V**.
10. Acceleration: **Normal**/Soft

ENTERING THE PROGRAMMING MODE

1. Turn on the transmitter, move the throttle stick to the top position.
2. Connect the battery pack to ESC.
3. Wait for 2 seconds, the motor will emit special tone like " beep-beep beep"
4. Wait for another 3 seconds, the motor will emit special tone like "123", which means program mode entered.

PROGRAMMABLE ITEMS

After entering program mode, you will hear 11 tones in a loop with the following sequence.

Tones	Programmable items	
1). "beep"	SMR Function	(1 short tone)
2). "beep.beep"	Brake Type	(2 short tone)
3). "beep.beep.beep"	Motor Timing	(3 short tone)
4). "beep.beep.beep.beep"	Motor Rotation	(4 short tone)
5). "beep--"	SR Function	(1 long tone)
6). "beep--.beep"	Battery cells	(1 long 1short)
7). "beep--.beep.beep"	Low Voltage Cutoff Threshold	(1 long 2 short)
8). "beep--.beep.beep.beep"	Low Voltage Cutoff Type	(1 long 3 short)
9). "beep--.beep.beep.beep.beep"	BEC Voltage	(1 long 4 short)
10). "beep--beep--"	Acceleration	(2 long tone)
11). "beep--beep--.beep"	Restore Factory Setup Defaults	(2 long 1 short)

Note: 1 long "beep--" = 5 short "beep"

SET ITEM VALUE

Moving the throttle stick to the bottom position within 2 seconds after one kind of following tones, this item will be selected. After the programmable item selected, then you will hear several tones in loop as follows on each programmable item, set the value matching to a tone by moving throttle stick to top position when you hear the tone, then the motor will emit special tone like "123", means this value is set and saved.

For example: If you want to set the motor rotation, when you hear four short tones of "Beep", moving the throttle stick to the bottom position within 2 seconds, means you enter the motor rotation menu. One short tone of "Beep" is forward direction(CW), two short tones of "Beep" is reverse direction(CCW). If you want to set to reverse direction(CCW), moving the throttle stick to the top position when you hear the two short tones of "Beep", then you will hear a special confirmation tone like "123", which means the "CCW" is set and saved.

Keeping the throttle stick at top, you will go back to programming mode and you can select other items; or moving the stick to bottom within 2 seconds will exit program mode directly.

IMPORTANT WARNINGS

- ZTW is not responsible for your use of this product, or any damage or injuries you may cause or sustain as a result of its usage.
- Always place safety as priority when you use the product.
- An electric motor that is connected in combination with a battery and/or ESC may start unexpectedly and cause serious damage and so should always be used with care and respect.
- We recommend you always remove the propeller when working on a model with the power source connected.
- Follow and observe all local laws and by-laws relating to model flying when flying RC planes.
- Never fly over others or near crowds.

KEY FEATURES

1. Utilizes powerful next generation MOSFET with a low thermal signature, high peak current threshold and reliability.
2. Features high performance 32bit microprocessor as standard. Stronger computing ability and faster processing rates.
3. Super smooth start up and throttle throughout the power range.
4. Higher driving efficiency and more energy-saving.
5. Adjustable SBEC output voltage, 5V/6V. (40A/50A/60A/80A/100A have SBEC adjustable)
6. Multiple protection protocols: start-up, over-heat, low-voltage cutoff, signal loss, phase loss etc.
7. Supports wide range of high RPM type motors commonly found in today's market.
8. Fully programmable via optional ZTW mobile app or ZTW LCD programming card.

SPECIFICATION

Type	PN#Model	Cont./Burst Current(A)	Battery cell NiXX\Lipo	Weight (g)	BEC Output	Size(mm) L*W*H	User Program
Beatles 20A SBEC G2	3020211	20A/30A	5-12NC\2-4Lipo	25	5.5V/4A	60*25*10	Yes
Beatles 30A SBEC G2	3030211	30A/40A	5-12NC\2-4Lipo	25	5.5V/4A	60*25*10	Yes
Beatles 40A SBEC G2	3040211	40A/55A	5-12NC\2-4Lipo	37	5V/6V 4A	68*25*10	Yes
Beatles 50A SBEC G2	3050211	50A/65A	5-12NC\2-4Lipo	37	5V/6V 4A	68*25*10	Yes
Beatles 60A SBEC G2	3060211	60A/80A	5-18NC\2-6Lipo	50	5V/6V 8A	70*34*10	Yes
Beatles 80A SBEC G2	3080211	80A/100A	5-18NC\2-6Lipo	75	5V/6V 8A	90*37*10	Yes
Beatles 100A SBEC G2	3100211	100A/120A	5-18NC\2-6Lipo	80	5V/6V 8A	90*37*10	Yes

Wires Connection:

The speed controller is connected to the motor via the three wires coming from the ESC/MOTOR. These wires can be soldered directly together if desired, but the recommendation is to use suitable high quality connectors that are properly soldered to the wires and insulated with heat shrink to connect the ESC and motor wires. Note: It is recommend that your battery wire length not exceed 152mm (6 inches)
- Ensure your choice of connectors/plugs meet the current drawn demands of your set-up (battery and motor connectors/plugs).
- Use heat shrink tubing to cover and insulate all solder joints.
- Servo lead/JR plug from the ESC plugs into the throttle channel of your receiver.
- Reversing lead from the ESC plugs into the single pin of any spare Rx channel and should assigned to a 2 position switch on your Tx.
- Ensure correct polarity when connecting the ESC to the battery (red to red, black to black).
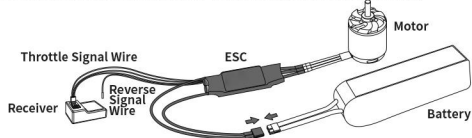
THROTTLE CALIBRATION

(IMPORTANT: Please ensure you manually calibrate the throttle range when using the ESC for the first time. This should always be done with the propeller removed if the ESC is connected to a motor and with the ESC correctly connected to you Rx and your Rx bound to your radio)

Turn on your transmitter and when fully initiated, move the throttle stick to the highest position (ensure throttle trim is neutral first). ▶ Connect your flight battery to the ESC and wait for about 2 seconds.

Motor will now beep a number of times (one beep for every cell in your flight battery) followed by a longer "Beep-----Beep". ◀ The motor will make two short beeps, lower the throttle stick to the lowest position as soon as you hear these two beeps.

This indicates that the throttle for your ESC is now calibrated and ready to use.

PROGRAMMING TONE REFERENCE TABLE

Items \ Tones	"beep" 1short tone	"beep.beep" 2short tone	"beep.beep.beep" 3short tone	"beep.beep.beep.beep" 4short tone	"beep--" 1long	"beep--beep" 1long 1short	"beep--beep.beep" 1long 2short
SMR Function	*OFF	ON					
Brake Type	*OFF	Soft Brake	Mid Brake	Hard Brake			
Motor Timing	*Auto	Low	Mid	High			
Motor Rotation	*CW	CCW					
SR Function	ON	*OFF					
Battery Cells	*Auto	2S	3S	4S	5S	6S	
Low voltage Cutoff Threshold	OFF	NIMH50%	NIMH60%	*3.0V	3.2V	3.4V	3.6V
Low Voltage Cutoff Type	*Reduce Power	Cut off Power					
BEC Voltage	*5V	6V					
Acceleration	*Normal	Soft					
Restore Factory Default Sets	Restore						

❶ Note: " * " value means default settings.

PROTECTION FUNCTION

1. Start-up protection: If the motor fails to start normally within 2 seconds after pushing the throttle to start, the ESC will cut off the output power, and you need to make the throttle calibration again, then ESC can be restarted. Possible reasons: disconnection or poor connection between ESC and motor, the propeller or motor is blocked by other objects, the gearbox is damaged, etc.)
2. Over-heat protection: When the temperature of the ESC is over about 110°C, the ESC will automatically reduce the output power for protection, but will not fully shut down the power, reduce it to 70% of the full power at most to ensure the motor has enough power to avoid crashes.
3. Throttle signal loss protection: The ESC will reduce the output power if throttle signal is lost for 1 second, will cut off output to the motor if the throttle signal is lost over 2 seconds. If the throttle signal recovers during power down, the ESC will immediately resume throttle control. In this way, the ESC will not protect when the signal loss less than 2 seconds, only when the signal lost is over 2 seconds or longer time. And the ESC will reduce the output power gradually instead of cutting off it immediately, so the player has certain amount of time to save the plane, taking into account safety and practicality.
4. Over load protection: The ESC will cut off power or restart automatically when the load increased a lot suddenly, possible reason is the motor blocked.

TROUBLE SHOOTING

Trouble	Possible Reason	Action
After powering up, ESC emits the sound of battery cells, but motor can't run.	ESC doesn't set throttle range.	Set throttle range again.
After powering up, motor doesn't run and doesn't emit any sound.	1.Bad connection between ESC and battery. 2.Bad soldering cause bad contact. 3.Low voltage of the battery. 4.Quality problem of ESC.	1.Clean the connectors or replace them, check the connection polarity. 2.Solder the wires again. 3.Check battery pack, use full-charged battery. 4.Change ESC.
Motor doesn't work and no audible tone emitted after connecting the battery. Servos are not working either.	1. Poor/loose Connection between battery Pack and ESC. 2. No power 3. Poor soldered connections 4. Wrong battery cable polarity 5. ESC throttle cable connected to receiver in the reverse polarity	Check all the connections make sure you are doing it right.
Motor does not work but servos do	1. Poor / loose connection between ESC and motor 2. Burnt motor coils 3. The battery pack voltage exceeds the acceptable range. 4. Throttle stick is not at the lowest position 5. The ESC throttle calibration has not set up	1. Check all the connections make sure you are doing it right. 2. Change a new motor. 3. Solder the wires again. 4. Check the battery pack, use full-charged battery. 5. Set throttle range again.
When the ESC is powered on, the motor does not work and an alarm sound (continuously beeping) will sound.	The throttle stick is not in the bottom position after power on.	Move the throttle stick to the bottom position.
Motor runs in reverse rotation	Wrong cables polarity between the ESC and the motor.	Swap any two of the three cable connections between the ESC and the Motor or access the Motor Rotation function via the ESC programming mode and change the pre-set parameters.
Motor stops running in flight.	Lost throttle signal	Check proper operation of the radio equipment. Check the placement of the ESC and the Receiver and check the route of the receiver's aerial and ESC