ZTW Technology Co.,Ltd MANTIS G2 Series ESC User Manual

Thank you for purchasing ZTW Mantis G2 Brushless Electronic Speed Controller (ESC). Please read this manual carefully before using this product for the sake of safety. ZTW Model have no control over the use, installation, application, or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of this item.

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 connection with battery pack and ESC may start unexpectedly and cause serious danger. Always treat them with enough respect.
- We recommend you to remove the propeller when you working on the plane that with power source connected.
- Observe all local laws when you fly a RC airplane.
- Never fly over others or near crowds.

Key Features

1. The holes on both sides of the ESC and the unique fan guard structure make the ESC better heat dissipation.
2. Adopting new generation craft on the MOSFET, low heat generation, withstand large current instantly, and high reliability.
3. Adopting high performance 32 bit microprocessor, stronger computing ability and faster running speed.
4. Super smooth start-up and accurate throttle linearity.
5. Higher driving efficiency and more energy-saving.
6. Two modes: normal and soft acceleration. It is compatible with normal fixed-wing and EDF jet airplanes, please ensure to select the "Soft" acceleration when using EDF jet airplanes.
7. Multiple protections: start-up, over-heat, low-voltage cutoff, overload, over-current and signal loss.
8. Support high RPM motors, and compatible with most motors in the market.
9. The ESC has a separate programming interface to connect with LCD programming card or App adaptor for parameter setting.(Extra ZTW App adaptor or LCD program card needed)
10. The ESC has data returning feature, it can send data in real-time: current, voltage, temperature, RPM, throttle and ESC status. And you can check the data via ZTW App or LCD program box G2 in real-time.(The ESC under 65A doesn't have this feature)

Specification

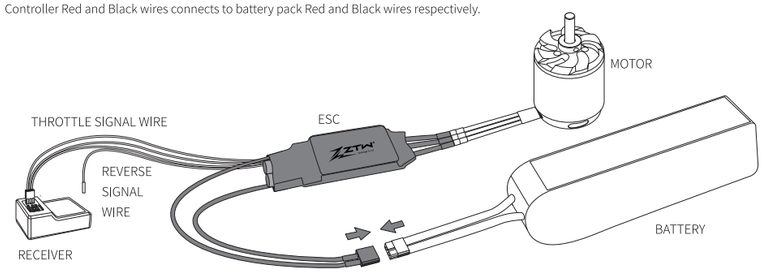
Type	PN#Model	Cont./Burst Current(A)	Battery cell Lipo/LiHV	Weight (g)	BEC	Size(mm)	User Program
Mantis 6A SBEC G2	2006211	6A/10A	2-3S LiPo/LiHV	7	5V/3A	25*15*6	Yes
Mantis 25A SBEC G2	2025211	25A/35A	2-4S Lipo/ LiHV	36	5V/6V/7.4V 4A	68*28*10	Yes
Mantis 35A SBEC G2	2035211	35A/45A	2-4S Lipo/ LiHV	40	5V/6V/7.4V 4A	68*28*10	Yes
Mantis 45A SBEC G2	2045211	45A/55A	2-6S Lipo/ LiHV	45	5V/6V/7.4V 4A	73*28*10	Yes
Mantis 65A SBEC G2	2065211	65A/75A	3-6S Lipo/ LiHV	60	6V/7.4V/8.4V 8A	60*36*23	Yes
Mantis Nano 80A HV G2	2080411	80A/90A	6-14S LiPO/LiHV	88	NONE	56*31*23	Yes
Mantis 85A SBEC G2	2085211	85A/95A	3-8S Lipo/ LiHV	107	6V/7.4V/8.4V 8A	88*38*24	Yes
Mantis 105A SBEC G2	2105211	105A/115A	3-8S Lipo/ LiHV	114	6V/7.4V/8.4V 8A	88*38*24	Yes
Mantis 125A SBEC G2	2125211	125A/135A	3-8S Lipo/ LiHV	127	6V/7.4V/8.4V 8A	88*38*24	Yes
Mantis 130A HV G2	2130411	130A/150A	6-14S Lipo/LiHV	205	NONE	82*45*33	Yes
Mantis 160A HV G2	2160411	160A/180A	6-14S Lipo/LiHV	209	NONE	82*45*33	Yes

Wires Connection

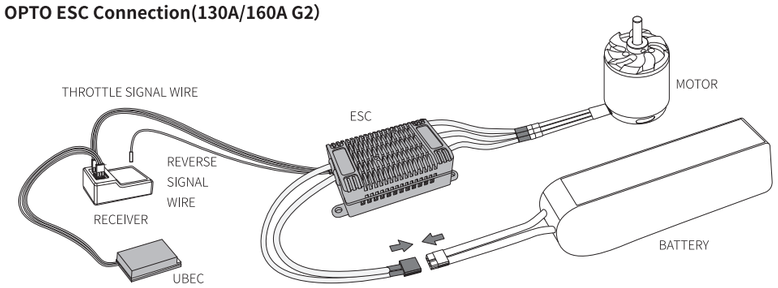
The speed controller can be connected to the motor by soldering directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tube. The maximum length of the battery pack wires shall be within 6 inches.

- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tubes.

Plug the "JR" connector into the receiver throttle channel.
Controller Red and Black wires connects to battery pack Red and Black wires respectively.



OPTO ESC Connection(130A/160A G2)



Throttle Calibration

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.

The motor will make two short beeps, lower the throttle stick to the lowest position as soon as you hear these two beeps.

Motor will now beep a number of times (one beep for every cell in your flight battery) followed by a longer "Beep----Beep".

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

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.

The motor will beep several sounds, sounds time presents the amount of battery cells.

When the motor emits "Beep----Beep", means self-test is finished, the ESC is ready to work.

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 LCD programming card 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 RVS 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**/5°/10°/15°/20°/25°/30°
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**/Set this item manually
   Auto: When the "Auto" is selected, the ESC will automatically calculate the number of Lipo cells as per 3.8V/Cell.
7. Low Voltage Cutoff Threshold: OFF/2.3V/2.5V/**3.0V**/3.2V/3.4V/3.6V
   For example: using 4 lithium batteries and setting 3.0V as the low voltage cutoff value, then the low voltage protection threshold is: 4*3.0 = 12.0V
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. BEC: **6.0V**/7.4V/8.4V
   The 25A/35A/45A ESC's BEC is 5V/6V/7.4V, the Mantis 130A/160A G2 doesn't have built-in BEC.
10. Acceleration: **Normal**/Soft
    Please ensure to select the "Soft" acceleration when using EDF jet airplanes.
11. Start-up Power: Low/**Mid**/High

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)

❶ Note: 1. 1 long "beep- -" = 5 short "beep"Programmable items
2. The BEC items is invalid for Mantis 130A HV and 160A HV G2, as they don't have built-in BEC.

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.

Programming Items

Items \ Tones	"beep"	"beep.beep"	"beep.beep .beep"	"beep.beep .beep.beep"	"beep- -"	"beep- - beep"	"beep- - beep.beep"
	1short tone	2short tone	3short tone	4short tone	1long	1long 1short	1long 2short
SMR Function	***OFF**	ON					
Brake Type	***OFF**	Soft Brake	Mid Brake	Hard Brake			
Motor Timing	***Auto**	5°	10°	15°	20°	25°	30°
Motor Rotation	***CW**	CCW					
SR Function	ON	***OFF**					
Battery Cells	***Auto**	2S	3S	4S	6S		
		3S	4S	6S	8S		
		6S	8S	10S	12S	14S	
Low voltage Cutoff Threshold	OFF	2.3V	2.5V	***3.0V**	3.2V	3.4V	3.6V
Low Voltage Cutoff Type	***Reduce Power**	Cut off Power					
BEC Voltage	***5V**	6V	7.4V				
	***6V**	7.4V	8.4V				
Acceleration	***Normal**	Soft					
Start-up Power	Low	***Mid**	High				
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.
5. Over-current protection: When the peak current exceeds the specified value, the ESC will immediately cut off the output power, and then restart to restore the power. If the current exceeds the specified value again, the output power will be completely cut off. Possible reason is overload, burnt motor or some others.

Trouble Shooting

Trouble	Possible Reason	Action
After powering up, ESC emits the sound of battery cells, but motor can't run.	1.Bad connection between ESC and battery. 2.ESC doesn't set throttle range. 3.Bad soldering cause bad contact. 4.Low voltage of the battery. 5.Quality problem of ESC.	Set throttle range again.
After powering up, motor doesn't run and doesn't emit any sound.		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 does n'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.

Explanations for Warning Tones

Troubles:	Warning Tones:
1.Throttle signal loss	"Beep--Beep--"(every two seconds)
2.Temperature protection	"Beep Beep-Beep Beep--"(every two seconds)
3.Low voltage protection	"Beep Beep Beep--Beep Beep Beep--"(every two seconds)
4.The throttle value is not at 0% throttle	"Beep-Beep-"(every 200 milliseconds)
5.The voltage is not within the range	"DoRaMi-DoRaMi-"(every 200 milliseconds)

Shenzhen ZTW Model Science & Technology Co.,Ltd
ADD: 2/F, Block 1, GuanFeng Industrial Park, Jiuwei, Xixiang, Baoan, Shenzhen, China, 518126
TEL: +86 755 29120026, 29120036, 29120056 FAX: +86 755 29120016 WEBSITE: www.ztwoem.com EMAIL: support@ztwoem.com

螳螂 MANTIS G2 系列

无刷电子调速器说明书

感谢您使用中特威科技有限公司设计、制造的无刷电子调速器（ESC）。我们强烈建议您在使用之前阅读本使用手册。深圳市中特威科技有限公司有权不经通知变更其产品，包括其外观和性能参数及使用要求；对其产品是否适合特定用途不作任何保证、申明或承诺。不承担因第三方产品相关修改所引起的任何责任，中特威科技有限公司也不承担因应用该产品而产生的任何责任，包括直接损失或间接损失的赔偿责任。

注意事项

- 检验无线电接收装置上的正确设置，第一次测试ESC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池。
- 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。
- 使用正确的电缆连接器。
- 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。

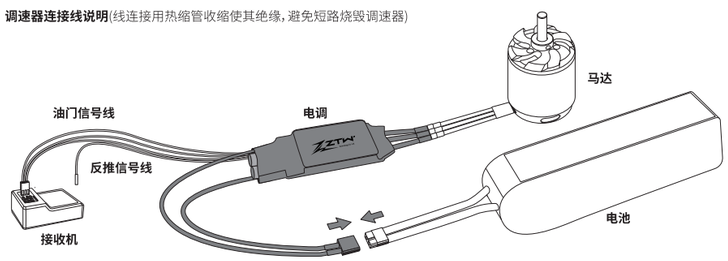
主要特性

1. 两边开孔加独特的导流风道结构，使得电调散热效果更好。
2. 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。
3. 高性能32位处理器，运算能力更强，运行速度更快。
4. 超流畅的启动与精准的油门线性 。
5. 效率高，电调更节能，续航时间更长。
6. 具有普通启动/柔和启动两种模式，兼容普通固定翼与涵道飞机(涵道飞机请务必选择柔和启动模式)。
7. 多重保护：启动保护，过温保护，低压保护，过负荷保护，电流保护，信号丢失保护。
8. 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。
9. 具备独立参数编程线，可用LCD编程卡或手机App编程，操作更简单方便(需单独购买ZTW LCD编程卡或蓝牙模块)。
10. 具有数据回传功能，可实时发送数据：电流、电压、温度、转速、油门、电调状态，且可用手机App或LCD编程卡上实时查看以上数据。(65A以下电调无此功能)

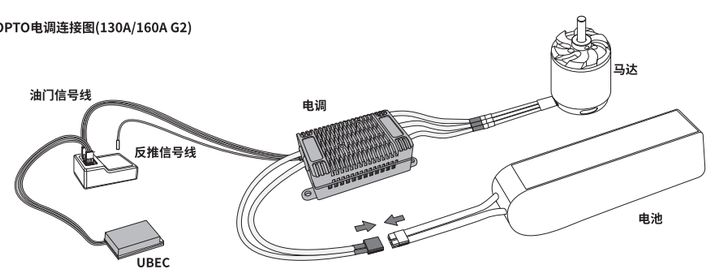
产品规格

Type	编号	持续电流 峰值电流 (A)	电池节数	重量 (g)	BEC输出	尺寸(mm) (长*宽*高)	支持编程卡
Mantis 6A SBEC G2	2006211	6A/10A	2-3S LiPo/LiHV	7	5V/3A	25*15*6	是
Mantis 25A SBEC G2	2025211	25A/35A	2-4S Lipo/LiHV	36	5V/6V/7.4V 4A	68*28*10	是
Mantis 35A SBEC G2	2035211	35A/45A	2-4S Lipo/LiHV	40	5V/6V/7.4V 4A	68*28*10	是
Mantis 45A SBEC G2	2045211	45A/55A	2-6S Lipo/LiHV	45	5V/6V/7.4V 4A	73*28*10	是
Mantis 65A SBEC G2	2065211	65A/75A	3-6S Lipo/LiHV	60	6V/7.4V/8.4V 8A	60*36*23	是
Mantis Nano 80A HV G2	2080411	80A/90A	6-14S LiPO/LiHV	88	NONE	56*31*23	是
Mantis 85A SBEC G2	2085211	85A/95A	3-8S Lipo/LiHV	107	6V/7.4V/8.4V 8A	88*38*24	是
Mantis 105A SBEC G2	2105211	105A/115A	3-8S Lipo/LiHV	114	6V/7.4V/8.4V 8A	88*38*24	是
Mantis 125A SBEC G2	2125211	125A/135A	3-8S Lipo/LiHV	127	6V/7.4V/8.4V 8A	88*38*24	是
Mantis 130A HV G2	2130411	130A/150A	6-14S Lipo/LiHV	205	NONE	82*45*33	是
Mantis 160A HV G2	2160411	160A/180A	6-14S Lipo/LiHV	209	NONE	82*45*33	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)



OPTO电调连接图(130A/160A G2)



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

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 ▶ 自检完成，发出“滴--滴”确认音 ▶ 电调准备就绪

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至地面使用，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**/5度/10度/15度/20度/25度/30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(动能回收):打开/**关闭**
   效率更高，更节能，续航时间更长
6. 锂电节数: **自动**/手动设置
   自动：按单节电池3.8V计算电池节数
   手动设置：根据不同电调电压范围进行手动设置
7. 低压保护点: 关闭/2.3V/2.5V/**3.0V**/3.2V/3.4V/3.6V
   例如：使用4节锂电，设定为3.0V为低电压保住值，则低压保护阈值为: 3.0*4 = 12.0V
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: **6.0V**/7.4V/8.4V
   25A/35A/45A此三款电调BEC为5V/6V/7.4V可调，130A与160A HV G2此两款电调无BEC
10. 加速度: **普通**/柔和
    涵道飞机请务必选择柔和模式！
11. 启动力度: 低/**中**/高

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”	锂电节数	(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.——滴”	启动力度	(2长1短音)

注：1. 一声长嘀相当于五声短嘀。
2. 130A与160A HV G2此两款电调无BEC，因此BEC项设置无效

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

鸣叫报警音说明

问题	报警音
1.油门信号丢失	“哔–哔–”(每隔2s)
2.温度保护	“哔哔–哔哔–”(每隔2s)
3.低压保护	“哔哔哔–哔哔哔–”(每隔2s)
4.上电油门不归零	“哔-哔-”(每隔200ms)
5.电压不在支持范围	“123-123-”(每隔200ms)

编程参数表

设定项 \ 提示音	“嘀”	“嘀.嘀”	“嘀.嘀.嘀”	“嘀.嘀.嘀.嘀”	“嘀—”	“嘀—嘀”	“嘀—嘀.嘀”
	1短音	**2短音**	**3短音**	**4短音**	**1长音**	**1长1短音**	**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	5度	10度	15度	20度	25度	30度
马达转向	正向(CW)	反向(CCW)					
SR功能	打开	关闭					
锂电节数	自动计算	2S	3S	4S	6S		
		3S	4S	6S	8S		
		6S	8S	10S	12S	14S	
低压保护值	关闭	2.3V	2.5V	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	7.4V				
	6V	7.4V	8.4V				
加速度	普通	柔和					
启动力度	低	中	高				
恢复出厂默认	复位						

ⓘ 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，最多降到全功率的 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，但电调不是立即关闭输出，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。
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。
5. 电流保护：当瞬时电流超过规定值以后，电调会立即切断动力输出，然后重启恢复动力输出，如再次出现电流超过规定值，则彻底切断动力输出。可能原因：负载过重或马达连线短路。

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，伺服系统也未运行	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位相反 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，但伺服系统在运行接通电调后马达不工作，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

地址:深圳市宝安区西乡街道九围新村冠锋工业园一栋二楼
电话: +86 755 29120026, 29120036, 29120056　　传真: +86 755 29120016
网址: www.ztwoem.com　　邮箱: support@ztwoem.com