魔兽 BEAST G2 系列

无刷电子调速器说明书

感谢您购买中特威产品，Beast G2 系列电调是我们新一代的无刷电子调速器(RTR版本)。无刷动力系统功率强大，请您在使用设备前仔细阅读本说明书。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

- 不能让小孩在无成人监管的情况下使用此产品。
- 电调在使用过程中可能会变烫，拿的时候要小心。
- 若需对电调的输入输出线、插头做相关焊接时，请使用至少60W功率的焊接设备进行焊接。
- 不使用电调时需要断开电池。
- 使用电调时不能靠近易燃物品。
- 如果电调出现过热，冒烟或者着火，请立即停止使用，断开电池并寻求帮助。

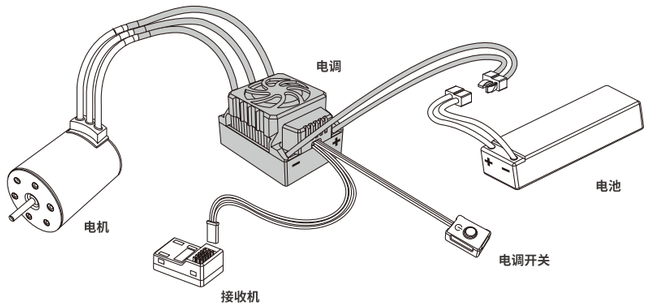
主要特性

1. 全防水设计,适应各种气候环境。
2. 电调使用了32位处理器，提供更加强大的运算能力及更精准的油门输出。
3. 更加优秀的油门启动、加速度及油门线性。
4. 多重保护功能：电池低压保护、过温保护、油门信号丢失保护。
5. 支持LED编程卡对电调参数进行设定。

产品规格

产品名称	持续/峰值电流	电池节数	BEC输出	尺寸(mm)	重量(g)	编程方式	防水特性	适用车型
Beast SL 50A G2	50A/300A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	94	LED	全防水	1/10th电房/电越/卡车/大脚车
Beast SL 60A G2	60A/360A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	95	LED	全防水	1/10th电房/电越/卡车/大脚车
Beast SL 80A 2-3S G2	80A/420A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	98	LED	全防水	1/10th电房/电越/卡车/大脚车
Beast SL 80A 2-4S G2	80A/420A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	48x38x32.5	100	LED	全防水	1/10th电房/电越/卡车/大脚车
Beast SL 120A SCT G2	120A/720A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	56.5x38x34.5	112	LED	全防水	1/10th短卡/卡车/大脚车
Beast SL 150A G2	150A/900A	2-6S LiPo/ 6-18 Cells NiMH	6V,7.4V/6A	55x48x37.5	153	LED	全防水	1/8th电房/电越/卡车/大脚车

电调连接



电池连接

电调连接电池时，要特别注意正负极位置，错误的连接会损坏电调和电池。如上图所示，电调正极线连接电池的正极，负极线连接电池的负极。

电机连接

电调与马达相连无严格的线序要求，电调的#A/#B/#C可以与电机的三线随意对接，若出现转向相反，任意交换两条马达线即可。

接收机连接

信号线提供6.0V电压给到接收机、舵机等，所以不需要额外的电池，外接电源到接收机可能会损坏电调。

黑线　　RX- 负极
红线　　RX+正极6.0V
白线　　RX 信号线

电调软件功能及设置

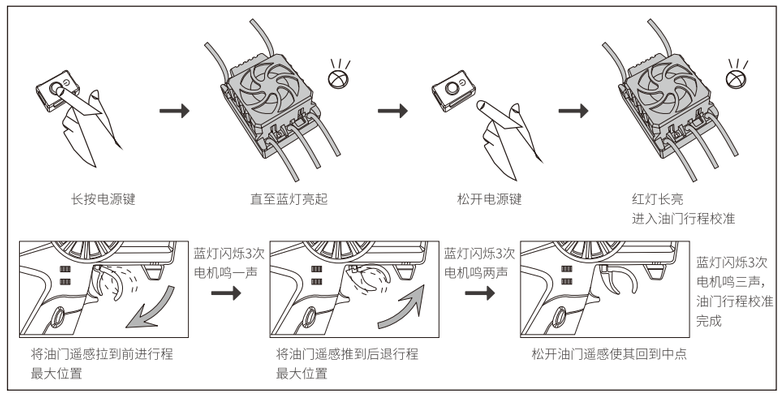
开关机

1.短按电源键电调开机。
2.长按电源键至全部LED灯熄灭，电调将关机（油门离开中点10%距离后不能关机）。

校准油门行程

1. 电调连接好电池及接收机，打开遥控器。
2. 关机状态下长按电源键，直至蓝灯亮起，同时电机长鸣叫一声，松开电源键，电调将进入油门行程校准。电调进入油门行程校准后，红灯长亮，若没有油门信号，蓝灯一直双闪；油门摇杆在中位，蓝灯熄灭。
3. 将油门摇杆拉到前进行程最大位置，蓝灯将闪烁3次，然后电机鸣叫一声，表示电调已记录前进油门行程，蓝灯常亮。
4. 电调记录前进油门行程后，将油门摇杆推到后退行程最大位置，蓝灯将闪烁3次，然后电机鸣叫两声，表示电调已记录后退油门行程，蓝灯常亮。
5. 电调记录后退油门行程后，松开油门摇杆使其回到中点，蓝灯将闪烁3次，然后电机鸣叫三声，表示油门行程校准完成。
6. 电调支持反向油门行程校准，即遥控器在油门校准时设置了油门反向，导致油门信号脉宽大小的变化与正常情况相反时（正常情况下拉摇杆油门信号脉宽变大，推摇杆油门信号脉宽变小），这种情况下电调仍然可以校准油门行程，电调前进、后退不受遥控器反向的影响。

注：*油门行程校准完成后，新油门行程立即生效，无需重启电调。
　　*如果在蓝灯闪烁期间油门摇杆离开前进行程一定范围，电调将退出油门行程校准。



LED编程卡

1. 如何连接
　把电调与电池连接通电后，短按电调电源键开机，然后电调信号线连接到编程卡上方右侧接口，等待两秒后LED编程卡红灯亮，表示可以开始编程。
2. 如何设定参数
　按MENU键选择一级主菜单，按VALUE键选择二级子菜单，OK键表示确认，RESET键表示复位。
　比如需要设置Neutral Range在8%，先按MENU选至03，按VALUE选至02，再按OK键。
　电调复位时，先按RESET键，再按OK键。
　LED编程卡详细编程项见右图。

LED灯指示

1. 操作中

油门位置	蓝灯状态	红灯状态
中立位	蓝灯闪	红灯灭
最大油门位置	蓝灯亮	红灯亮
最大刹车位置	蓝灯灭	红灯亮

注: 蓝灯变频闪，油门正常，蓝灯的闪烁频率会随油门的大小变化，油门越大频率越高（肉眼可分辨）。

2. 当一些电调保护功能触发时
- 任何时候按下电源键红灯都会亮起。
- 红灯每隔一秒闪1次（¤ ¤ ¤），电压异常。
- 红灯每隔一秒闪2次（¤¤ ¤¤ ¤¤），温度异常。
- 红灯每隔一秒交替闪1次，2次（¤ ¤¤ ¤ ¤¤ ¤ ¤¤），电压和温度异常同时发生。
- 在开机时没有检测到油门信号，如果此时存在电压异常或者温度异常，红灯不会有相应指示。
- 蓝灯每隔两秒闪2次（¤¤　¤¤　¤¤），油门异常（无油门，开机油门不在零位）。

油门信号

1. 电调最大支持450Hz的PPM油门信号。
2. 以下情况电调将开启油门保护，蓝灯双闪：(a) 电调开机时，油门摇杆不在中位；(b) 丢失油门信号。
3. 电调正在输出波形驱动电机，如果此时油门信号丢失，电调立即停止输出，同时蓝灯双闪，直到油门信号正常后，电调恢复输出（油门摇杆不需要回中）。

无感

无感模式下PWM驱动频率由电调自主选择，用户设置无效。
无感模式下低于1KHz的刹车PWM频率设置无效，此时电调强制为1KHz。

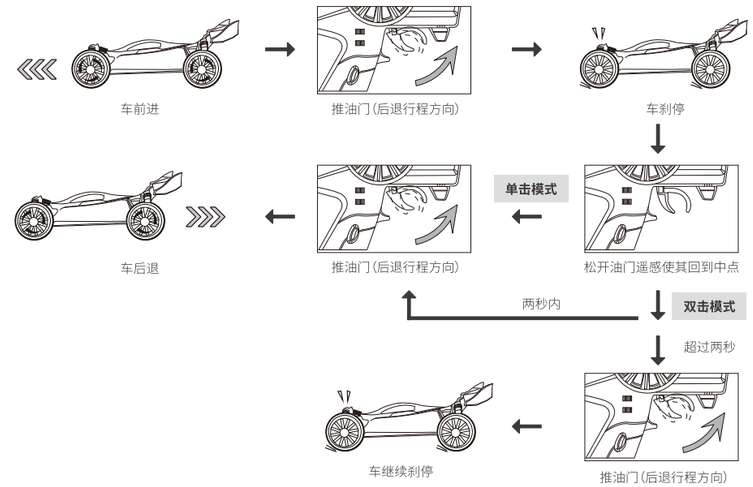
保护

1. 高压保护
　电调在开机瞬间检测到过高电压时，且电压保护设置不为“OFF”电调将开启电压保护，限制输出油门，输出油门值不会超过50%（高压保护只在开机瞬间起作用，在之后的过程中出现高压电调不会开启保护，高压保护激活后，即使电压降低到正常范围内也不能解除）。
2. 低压保护
　任何时候电调检测到电压低于设置值，并保持一段时间，电调开启低压保护，限制输出油门，输出油门值不会超过50%（低压保护激活后，即使电压回到正常范围内也不能解除）。
3. 高温保护
　温度大于设定值时，电调开启温度保护，限制输出油门，输出油门值不会超过50%（温度降低到65度以下，解除温度保护）。
4. 电压保护或温度保护设置为OFF时，如果此时存在电压或者温度异常的状况，LED正常显示相应的指示状态，只是不做“限制输出油门”的动作。
5. 驱动异常保护，指电调驱动电机发生异常，导致电机无法正常旋转。当驱动发生异常（堵转、缺相等），油门值大于一定数值，且持续了一段时间后，电调开启驱动异常保护，电机持续快速“嘀嘀嘀”鸣叫（如果发生了缺相，电机有可能无法发出鸣叫；有些电机鸣叫声会比较小），直到油门回中并保持0.2秒，才能解除保护，如果连续发生3次驱动异常，则无法解除保护，必须排除故障重启电调。

可编程项目描述

1. 油门响应（Throttle Response）：时间越短，加速越快
2. 油门缓降（Throttle Coast）：减油门时，车速不会立即下降，而是滑行更远。
3. 油门中点宽度（Neutral Range）：油门中点宽度越大，需要拨动油门摇杆越远离中点车才开始启动。
4. 最小油门值（Min. Throttle）：值越大，当拨动油门摇杆正好离开中点范围时，车启动速度越大。
5. 最大前进力度（Max. Forward force）：值越小，前进极速越小。
6. 最大倒车力度（Max. Reverse force）：值越小，后退极速越小。
7. 刹车响应（Brake Response）：刹车响应时间越短，刹车越快。
8. 最小刹车力度（Min. Brake Force）：进入刹车后，值越大，当拨动油门摇杆正好离开中点范围时，刹车力度越大。
9. 最大刹车力度（Max. Brake Force）：值越小，极限刹车力度越小。
10. 前进拖刹力度（Fwd. Drag Brake Force）：油门在中位时，刹车的力度；值越小，车能滑行更远。
11. 倒车拖刹力度（Rev. Drag Brake Force）：油门在中位时，刹车的力度，值越小，车能滑行更远。
12. 电机旋转方向（Motor Rotation）：某些车架在默认转向下，前进、后退都是相反的，此时设置另一个电机旋转方向可以纠正这种错误。
13. 运行模式（Running Mode）：运行模式分为前进/刹车、前进/刹车/后退、前进/后退。
14. 倒车模式（Reverse Mode）：当运行模式设置为前进/刹车/后退时，One Shot: 单击油门摇杆倒车，Two Shot: 双击油门摇杆倒车。
15. 低压保护（Cutoff Voltage）：低压保护设置为自动时，电调开机瞬间自动识别锂电节数。
16. 高温保护（Thermal Protection）：当电调温度上升到设置值时，电调会自动停止或降速.
17.BEC输出（BEC Output）：根据舵机需要设置BEC输出值

• 倒车模式：单击模式/双击模式（仅在前进/刹车/后退模式下）



故障快速处理

故障现象	可能原因	解决办法
上电后指示灯不亮，电机无法启动，风扇不转。	1、电池电压没有输入到电调。 2、电调开关损坏。	1、检查电源输入通路是否有焊接不良情况，并重新焊好。 2、更换开关。
电机转动过程中，突然停转或功率输出显著降低。	1、接收机遇到干扰。 2、电调进入电池低压保护状态。 3、电调进入过温保护状态。	1、检查接收机出现干扰的原因，检查发射机电池电量。 2、红灯每隔一秒闪1次，电压异常，请更换电池。 3、红灯每隔一秒闪2次，温度异常。
电机抖动，无法启动。	1、电调和电机连接的插头有虚焊。 2、电调故障（部分功率管MOSFET烧坏）。	1、检查各焊接点，必要时重新焊接。 2、联系经销商处理维修事宜。
油门在中点时，车子缓慢前进或缓慢后退。	1、遥控器中位有漂移，导致信号不稳。 2、油门行程没校准好。	1、更换信号稳定的摇控器。 2、重新校准油门行程。

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Beast G2 Series ESC User Manual

Thank you for your purchasing the ZTW product, Beast G2 series ESC is our new generation brushless electronic speed controller (RTR version). The high power systems for RC models can be very dangerous, we strongly suggest that you read this manual carefully before using your speed control. 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.

Caution

- Do not let children use this product without the supervision of an adult.
- The ESC might get hot during use, be careful when handling it.
- When soldering input/output wires and connections, set the iron to 60W minimum.
- Always disconnect the battery after use, do not store with the battery connected.
- Do not use near flammable materials.
- If the ESC overheats, emits smokes or burns, immediately discontinue use, disconnect the battery and seek assistance.

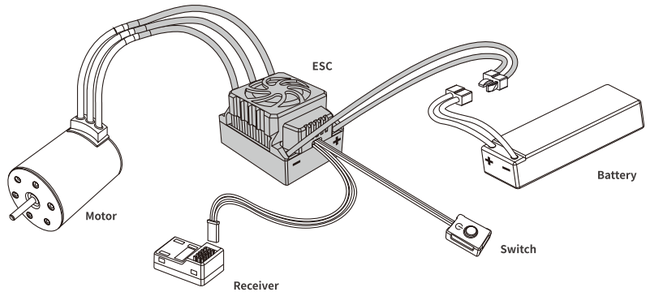
Features

- Completely water-proof and dust-proof.
- 32-bit microprocessor can support more powerful processing capability and more accurate motor output.
- Excellent start-up, acceleration and linearity features.
- Multiple protection features: Low voltage cut-off protection, over-heat protection and throttle signal loss protection.
- Be easily programmed with LED Program Card.

Specification

Product Name	Cont./ Peak Current	Input	BEC Output	Size(mm)	Weight(g)	Program By	Waterproof	Car Applicable
Beast SL 50A G2	50A/300A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	94	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 60A G2	60A/360A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	95	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 80A 2-3S G2	80A/420A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48x38x32.5	98	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 80A 2-4S G2	80A/420A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	48x38x32.5	100	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 120A SCT G2	120A/720A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	56.5x38x34.5	112	LED	Support	1/10th SCTs/ Truck/Monster Trucks
Beast SL 150A G2	150A/900A	2-6S LiPo/ 6-18 Cells NiMH	6V,7.4V/6A	55x48x37.5	153	LED	Support	1/8th Touring Cars/ Buggies/Trucks/ Monster Trucks

Connection



Battery Wire Connection

When connecting the battery, pay attention to polarity: incorrect connection will damage the ESC and Battery.

As shown in the figure above, connect the positive (+) wire is connected to (+) battery port, and the negative (-) wire is connected to the (-) battery port.

Motor Wire Connection

The #A, #B, #C wires of the ESC can be connected with the motor wires freely (without any sequence). If the motor runs in the opposite direction, please swap any two wire connections.

Receiver Wire Connection

The signal wire supplies 6.0V to the receiver, servo, etc. So there is no need to connect an additional battery. External power connected to the receiver may damage the ESC.

Black wire RX-
Red wire RX+6.0V
White wire RX-Signal

Software Functions and Settings

Power On/Off ESC

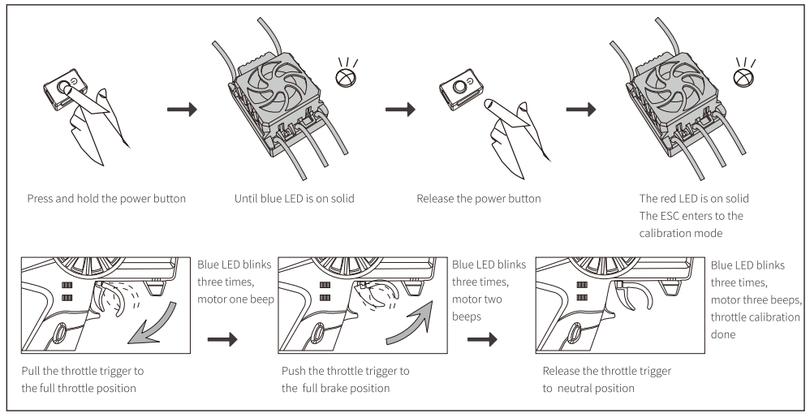
1. Press the power button then the ESC will be powered on.
2. Press and holding the power button until the all LEDs died out, then the ESC will be powered off.

(Note: Please place the throttle trigger on the neutral position: within 10%, otherwise the ESC can not be powered off.)

Throttle Calibration

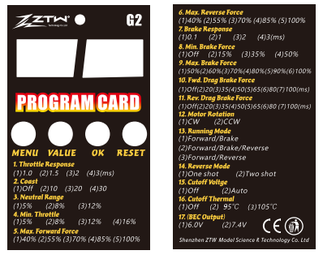
1. Connect the ESC with the battery and receiver well, then turn on the transmitter.
2. Press and holding the power button until the blue LED is on solid, the motor have a long beep at the same time, then release the power button, the red led will be on solid, the ESC enters to the calibration mode.
3. Pull the throttle trigger to the full throttle position, the blue led blinks three times and the motor beeps once, the full throttle position is saved.
4. Push the throttle trigger to the full brake position, the blue led blinks three times and the motor beeps twice, the full brake position is saved.
5. Release the throttle trigger to the neutral position, the blue led blinks three times and the motor beeps three times, the throttle calibration is completed.
6. The ESC can support reverse throttle calibration, if the transmitter throttle set reverse (it means pull the throttle will go to 1000 throttle position/normally is 2000, and push the throttle will go to 2000 throttle position/normally is 1000), then you do the throttle calibration the same way as usual (as above), it will not have any effects on the ESC forward and revers way even if the transmitter throttle set reverse.

Remark: No need to restart the ESC again after throttle calibration finished.
Do not move the throttle during the time of the blue led blinks.



LED Program Card

1. How to connect
   Connect the ESC with the battery, power on the ESC, then plug the ESC signal wire into the right socket of the LED, wait for two seconds until LED is on, you are ready to program.
2. How to program
   Press MENU button to select the main menu, press VALUE button to select the sub-menu, press OK button to confirm, press RESET button to reset.
   For example: if you want to set Neutral Range at 8%, press MENU button to select 03, and press VALUE button to select 02, then press OK button.
   If you want to reset the ESC value, press the RESET button first, then press OK button.
   Check the picture on the right for detail LED programmable value.



LED Status

1.During operation

Throttle Position	Blue LED	Red LED
Neutral	Blinking	OFF
Full Throttle	ON	ON
Full Brake	OFF	ON

Note: When you pull the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will go faster when the throttle goes higher.

2. When some protection is activated
- The RED LED is always on solid once the power button is pressed.
- The RED LED blinks, single flash between every one second. Repeat like "□ □ □" indicates that the voltage is abnormal.
- The RED LED blinks, double flash between every one second. Repeat like "□□ □□ □□" indicates that the temperature is abnormal.
- The RED LED blinks, single and double flash alternately between every one second. Repeat like "□ □□ □ □□ □ □□" indicates that both of the voltage and temperature is abnormal at the same time.
- The RED LED will not have any responds even the voltage or temperature is abnormal if not detect the signal.
- The BLUE LED blinks,double flash between every two seconds. Repeat like "□□ □□ □□" indicates that the throttle is abnormal. (No throttle, or the throttle is not on the neutral position)

Throttle Signal

1. The ESC can support the 450Hz maximum PPM throttle signal.
2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash:
   - The throttle trigger do not place on the neutral position when the ESC turns on.
   - Lost the throttle signal.
3. If the ESC lost throttle signal during the operation, the BLUE LED will blink double flash, and the ESC will start to work again until the throttle signal is back to normal.

Sensorless

1. The PWM driving frequency will be selected automatically by the ESC on sensorless mode, and the manual setting is invalid.
2. It is invalid to set the brake PWM frequency less than 1KHz and forced recognized as 1KHZ, if the ESC is on sensorless mode.

Protection

1. High Voltage Protection:
   If the ESC detected the voltage too high(Higher than the esc standard voltage), when the ESC turns on, and the voltage protection was not set "OFF", then the voltage protection will be activated, and the maximum throttle output will be limited within 50%.(The high voltage protection only worked on the moment of the ESC turns on, and it will not work on the other stages even it detected the high voltage, once the high voltage protection opened, even though the voltage comes down to the normal voltage, the protection will not be relieved.)
2. Low Voltage Protection:
   If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%.(Once the low voltage protection activated, even though the voltage comes back to normal, the protection can not be relieved.)
3. Thermal Protection:
   The output throttle from the ESC will be limited (not over 50%) with the thermal value you have preset.(The Thermal protection will be dismissed when the ESC temperature drop to 65°C)
4. If the voltage protection and temperature protection set off, and when the voltage and temperature become abnormal, the LED status will indicates the problems correspondingly, but will not limit the throttle output and will not close all ESC timing.
5. If the ESC detected the motor have the driving problem (like motor rotor locked or motor phase lost problem) which can cause the motor not run smoothly, and when the throttle trigger leave neutral position for a while, then the ESC driving abnormal protection will be activated, and the motor will emit special tone like beep-beep-beep (note: some motors can not beep or beep with a low sound if motor have phase loss problem), and the protection will be closed until you released the throttle trigger to neutral position for 0.2 seconds. If this problem occurs three times continuously, then you have to solve the motor driving problem first,or the protection will exist all the time.

Programmable Items Description

1. Throttle Response: The shorter the time, the quicker the acceleration.

2. Coast: With this function activated, the car won't slow down immediately but coast for a while when reducing the throttle input.

3. Neutral Range: The wider the neutral range, the further the throttle trigger/stick must be moved away from the neutral point. Otherwise, the car won't move.

4. Min. Throttle: The bigger the value, the more aggressive the start-up when moving the throttle trigger/stick away from the neutral range.

5. Max. Forward force: The lower the value, the slower the maximum speed in the Forward direction.

6. Max. Reverse force: The lower the value, the slower the maximum speed in the Reverse direction.

7. Brake Response: The shorter the time, the quicker the braking.

8. Min. Brake Force: After entering the braking mode, the higher the value, the stronger the brake force when moving the throttle trigger/stick away from the neutral range.

9. Max. Brake Force: The lower the value, the weaker the maximum brake force.

10. Fwd. Drag Brake Force: The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.

11. Rev. Drag Brake Force: The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.

12. Motor Rotation: It's the direction in which motor spins. With the factory default setting, it may run in the opposite direction in some scenarios. This function allows users to switch the rotational direction if necessary.

13. Running Mode: There are three running modes: Forward/Brake, Forward/Brake/Reverse, and Forward/Reverse.

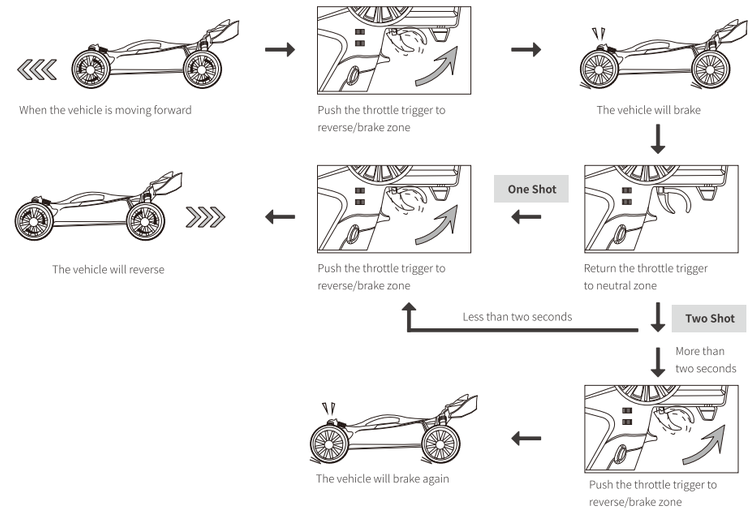
14. Reverse Mode: It's only available when the running mode is set to Forward/Brake/Reverse. There are two options: One Shot (pull the throttle trigger/stick once) & Two Shots (quickly pull the throttle trigger/stick twice).

15.CutOFF Voltage: With it set to "Auto", the ESC will automatically identify the number of LiPo cells you've plugged in the moment it's powered on.

16. Thermal Protection: The ESC will automatically cease operation when the internal temperature rises above user-selectable values.

17.BEC Output: Select the output of the Battery Eliminator Circuit depending on the operating voltage requirements of the servos.

- **Reverse Mode: One shot & Two shot (In the Forward/Brake/Reverse Mode)**



Trouble Shooting

Trouble Shooting	Possible causes	Solutions
The ESC was unable to start the status LED, the motor, and the cooling fan after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check if all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
The motor suddenly stopped or significantly reduced the output in operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the battery LVC (Low Voltage Cut off) protection. 3. The ESC entered the thermal (over-heat) protection.	1. Check all devices and try to find out all possible causes, and check the transmitter's battery voltage. 2. The RED LED blinks, single flash between every one second. 3. The RED LED blinks, double flash between every one second.
The motor stuttered but couldn't start.	1. Some soldering between the motor and the ESC was not good. 2. The ESC was damaged (some MOSFETs were burnt).	1. Check all soldering points, please re-solder if necessary. 2. Contact the distributor for repair or other customer services.
The car ran forward/backward slowly when the throttle trigger was at the neutral position.	1. The neutral position on the transmitter was not stable, so signals were not stable either. 2. The ESC calibration was not proper.	1. Replace your transmitter 2. Re-calibrate the throttle range or fine tune the neutral position on the transmitter.

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