



HOBBYWING QUICRUN Motor User Manual

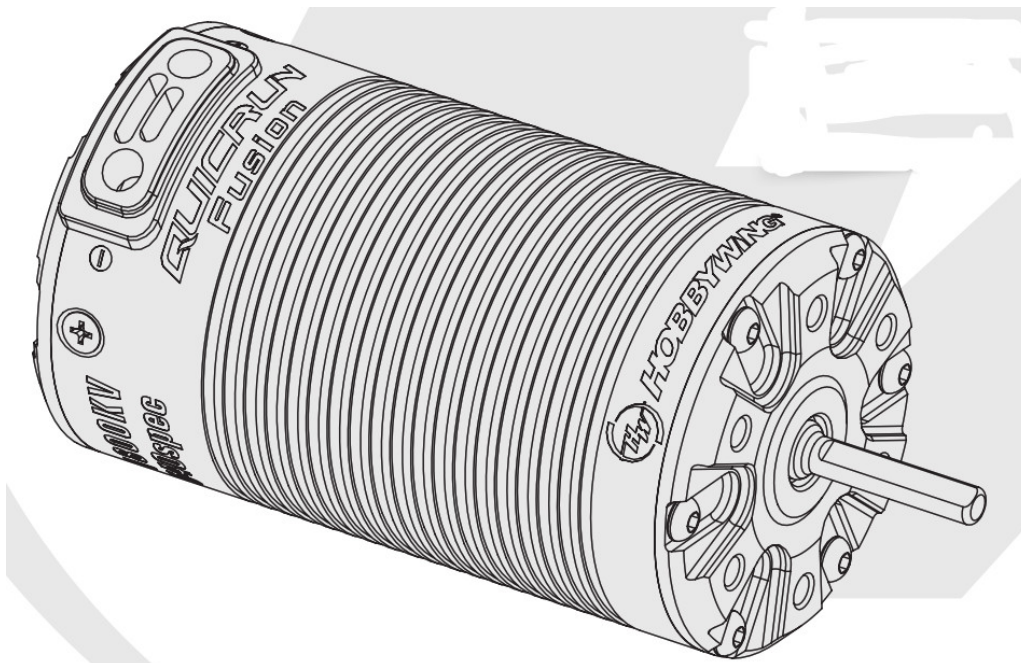
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USER MANUAL
QuicRun Fusion BL SYS for
Crawler-540Spec

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Disclaimer



Thank you for purchasing this HOBBYWING product! Any improper use may cause personal injury and damage to the product and related devices. We strongly recommend reading through this user manual before use and strictly abide by the specified operating procedures. We shall not be liable for any liability arising from the use of this product, including but not limited to reimbursement for incidental or indirect losses. Meanwhile, we do not assume any responsibility caused by unauthorized modification of the product. We have the right to change the product design, appearance, performance, and use requirements without notice.

Attentions

- Please make sure that all wires and connecting parts are well insulated before the ESC is connected with relevant connecting parts because a short circuit will damage the ESC.
- Please connect all parts carefully. If connect improperly, you may not be able to control the vehicle normally, or the equipment will be damaged or other unpredictable situations occur.
- Before using this system, please carefully check each power device and car frame instructions to ensure the power matching is reasonable. Prevent wrong matching from damaging the power system.
- If need to weld the input line, output line, and plug of ESC, please use welding equipment of at least 60W to ensure weld firmly.
- Do not let the external temperature of the system exceed 90 °C/194 °F, high temperature will destroy the power system.
- After use, remember to disconnect the battery and the ESC. If the battery isn't disconnected, the ESC will consume electric energy all the time even if it is off. It will discharge completely if connect to the battery for a long time, thus resulting in the failure of the battery or the ESC. We are not responsible for any damage caused by this!

Instruction for power on/off and Tones

Instruction for power on/off: Short press the switch button to start in off state; long press the switch button to shut down in on state.

Instruction for sound: Start in normal condition (Not setting throttle range), the times of beep emitted by motor indicates the number of Lipo Cells, for example, "Beep, Beep" indicates 2S Lipo; "Beep, Beep, Beep" indicates 3S

Lipo.

Features

- The integrated design of the ESC and the motor greatly reduces the overall volume and weight and makes the layout and wiring of car frame simpler and more convenient.
- The FOC driving mode, low-speed torque is strong. Smooth running at extremely low speed, which is far superior to the common sensored brushless power system, even better than the brushed power.
- Thanks to the sine wave driving mode, the whole system has high efficiency, small heat, and effectively extends the endurance time; and the motor runs more quietly and soft.
- The protection grade of the whole set of power is IP67, with excellent waterproof and dustproof performance. Under various weather conditions, the whole set of power can easily deal with the complex road surface containing silt, ice and snow, and water.
- Intelligent torque output and speed closed-loop control, fully experience the cruise control and steep slope slow descent function of 1:1 vehicle, making the control handy.
- Active drag brake force adjustment, providing unprecedented parking capacity on a slope.
- With strong built-in switch mode BEC, the continuous current is up to 4A, and support switch between 6V and 7.4v, easy to drive various powerful steering servo and high-voltage steering servo.
- Equipped with advanced and safe electronic switch to avoid reed stuck and contact rusted of traditional mechanic switch in a dusty and damp environment, and automatic close of the mechanic switch due to fierce impact.
- Multiple protection functions: battery low voltage protection, overheat protection, throttle lost protection, lock-up protection.
- It supports an LED setting box to set ESC parameters and has an independent parameter setting interface, which is integrated on the electronic switch, making setting parameters more convenient.

Instruction for programmable items

The column of white words on black background in the following table are the default values of programmable items.

No.	Setting item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1	RPM/Throttle Matching	Disabled	Disabled							
2	LiPo/NiMH Cells	Enabled	2S	3S						
3	Cutoff Voltage	Auto	Low	Intermediate	High					
4	ESC Thermal Protection	105 °C/21 °F	125 °C/257 °F	Disabled						
5	Motor Rotation	CCW	CW							
6	BEC Voltage	6.0V	7.4V							
7	Drag Brake Force	Disabled	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
8	Drag Brake Rate	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9
9	Max. Reverse Force	25%	50%	75%	100%					

1. RPM/Throttle Matching:

Option 1: Enabled

Through speed closed-loop control to realize cruised control function, that is, when the resistance of the vehicle changes, the ESC will automatically adjust the output torque.

Option 2: Disabled

Like common sensed brushless ESC, the ESC will not automatically adjust the output torque in this mode, that is, when the resistance of the vehicle changes, the speed will change accordingly.

2. Lipo Cells:

The default is automatic judgment. If you usually use the same battery, we suggest you set manually the number of Lipo Cells to avoid misjudgment (Which may mistakenly judge 3S Lipo that has no power as 2S Lipo that are fully charged, which will cause the low-voltage protection function of the ESC operates wrongly.

3. Cutoff Voltage:

This function is mainly to prevent the irrecoverable damage caused by the over-discharge of Lipo Cells. If the voltage protection is turned on, the ESC will monitor the battery voltage all the time during operation. Once the voltage is lower than the set threshold value, the power output will gradually reduce to 50% of the normal power within 3 seconds, and the power will be completely closed after 10 seconds. When entering the low-voltage protection, the red LED will blink in the way of “ ☆ ☆☆ ☆☆☆ ” in a single cycle. When set to no protection, the ESC will not cut off power due to low voltage. When using Lipo Cells, it is not recommended to set to (no protection), otherwise, the battery may be damaged due to over-discharge. For NiMH batteries, it is recommended to set this parameter to no protection. The low, medium and high options correspond to 3.0v/3.2v/3.4v respectively.

4. ESC Thermal Protection:

The ESC will close output automatically when the temperature rises to the preset value, and the green light will flash, and the output will be restored until the temperature drops. The green light flashes in the way of ☆☆☆ in single cycle when in overheat protection.

5. Motor Rotation:

The front of the motor shaft faces the user's face (i.e. the tail of the motor is far away from the user's face, when the radio is increasing the throttle in the forward direction if it is set to CCW, the motor shaft rotates counterclockwise; if it is set to CW, the motor shaft rotates clockwise. Due to the structure difference of car frame, the rotation direction would not be correct. If the rotation direction is wrong, change to the reverse direction.

6. BEC Voltage:

Option 1: 6.0V

Apply to the ordinary servo, if using high voltage servo, do not set to this, otherwise, it will not work normally due to insufficient voltage.

Option 2: 7.4V

Apply to high voltage servo, if use ordinary servo, do not set to this, otherwise, it will damage steering servo due to high voltage.

7. Drag Brake Force:

Drag brake means a brake force on the motor when the throttle trigger moves from the non-neutral range to the neutral range. There are 9 gears of drag brake force to adjust, "off" means the drag brake force is 0; the corresponding drag brake force increases from 1 gear to 8 gear. Select the appropriate drag brake force according to the actual situation.

8. Drag Brake Rate:

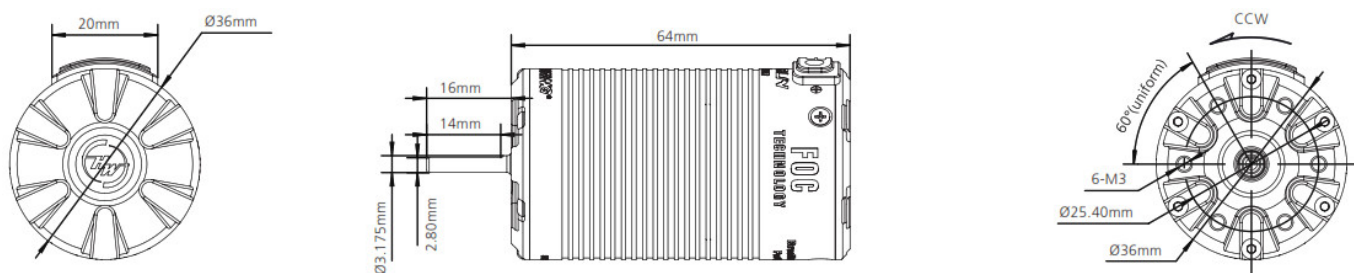
It means the rate when drag brake force increases from zero to the set value when the radio trigger enters the neutral range, commonly called a slow brake. This value has 9 gears to adjust. The higher the gear is, the greater the drag brake rate is. Reasonably set this value can make the vehicle stop more stably.

9. Max. Reverse Force:

The select different parameter values can produce different max. reverse force.

Specifications

Model	QuicRun Fusion BL SYS for Crawler-540Spec
Continuous peak current	40A/160A
Main applications	1/10 rock crawler
LiPo/NiMH Cells	2-3S Lipo, 6-9 Cells NiMH
BEC output	6V/7.4V adjustable, continuous current 4A (Switch mode)
Input plug	XT60
Size/Weight(entirety)	36mm(diameter)x64mm(length) / 201g (including wire plug)
Parameter setting	Independent programming interface(switch position)
Motor KV	1200KV, 1800KV
Diameter/length of Motor	36mm / 64mm
Shaft diameter / exposed shaft length	3.175mm / 16mm
Motor Poles	4 poles

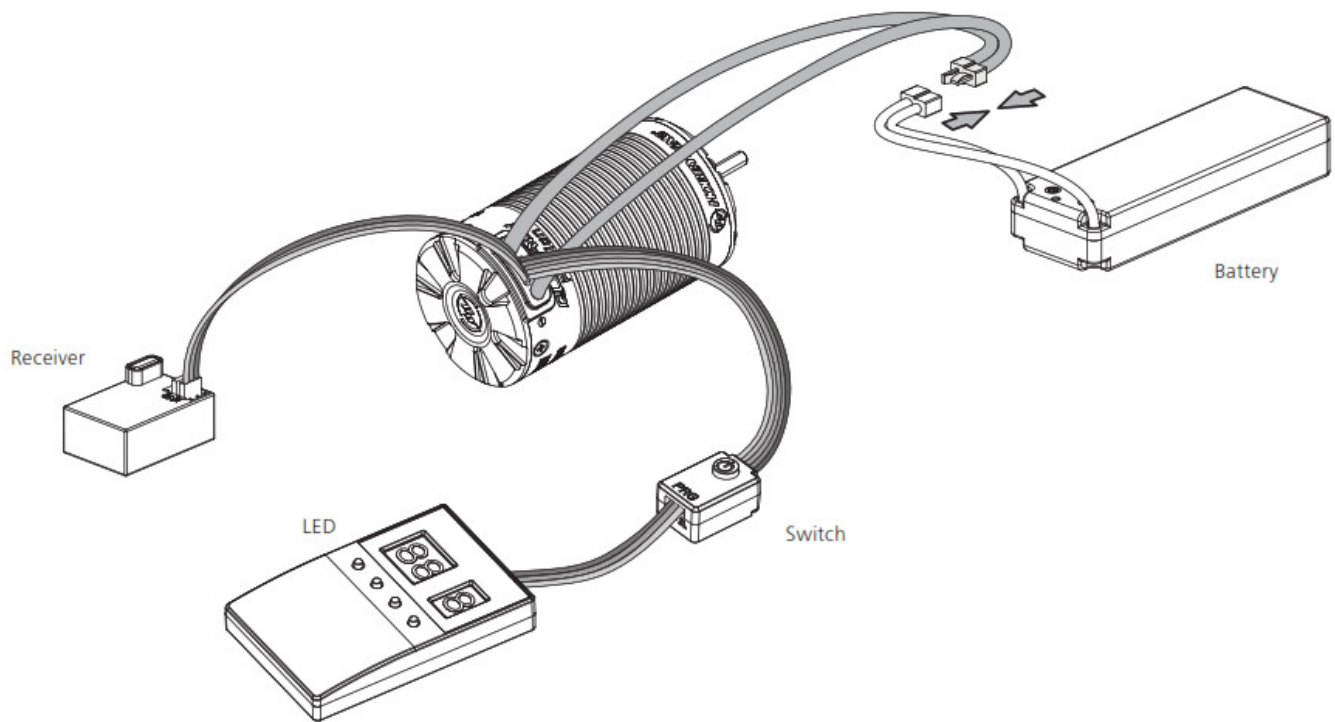


Parameter setting method

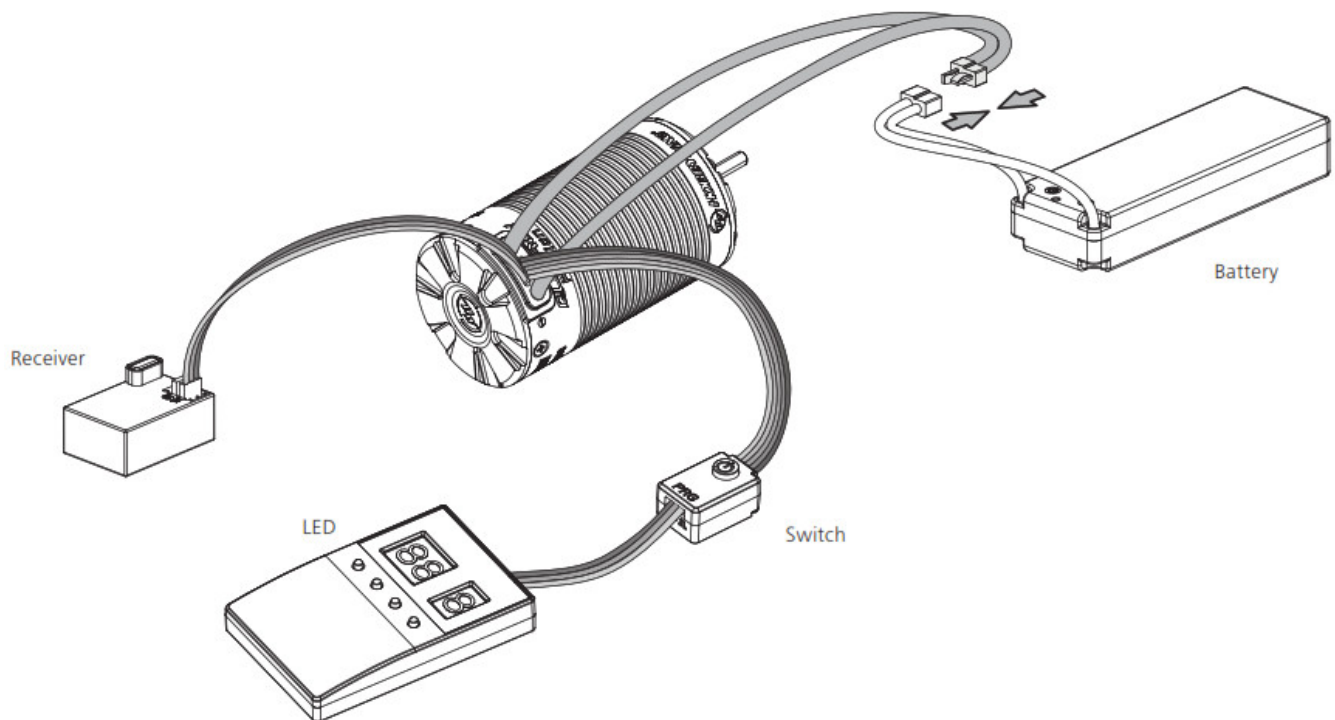
Use LED setting box to set ESC parameters

The ESC is equipped with a LED box. The LED box is small and suitable for outdoor use. The interface is intuitive. It is easy and fast to read and set parameters. The setting method is as follows:

The ESC is in off state, connect the 3pin setting interface on the 2 in 1 system switch with the interface marked with – + on the upper right corner of the setting box according to the polarity with a flat cable with JR plug at both ends. Then power on the ESC, after a few seconds, all parameters of the ESC can be displayed. The “ITEM” and “VALUE” buttons on the programming card can quickly select the programming items and parameter values, press the “OK” key to save the new parameters in ESC.



Begin to Use a New Brushed ESC



- **Connect receiver**

Insert the throttle control flat cable of the ESC into the throttle channel of the receiver (that's the THROTTLE channel). Because the red line of flat cable output 6V/7.4V voltage to receiver and steering servo, do not supply power to the receiver, otherwise the ESC may be damaged. If need to supply power, pick out the red line among the throttle line, wrap it and suspend.

- **Connect battery**

The input line of the ESC has polarity. When inserting the battery, make sure that the (+) pole of the ESC is connected to the (+) pole of the battery and the (-) pole is connected to the (-). If the ESC is connected reversely, the ESC will be damaged. There is no warranty service for damaging ESC due to power on reversely.



Warning: The power of the system is powerful. For the safety of you and other people around you, we strongly recommend that you remove the pinion gear before calibrating and setting the system, and turn on the control switch of the ESC when the wheel is suspended!

Factory reset

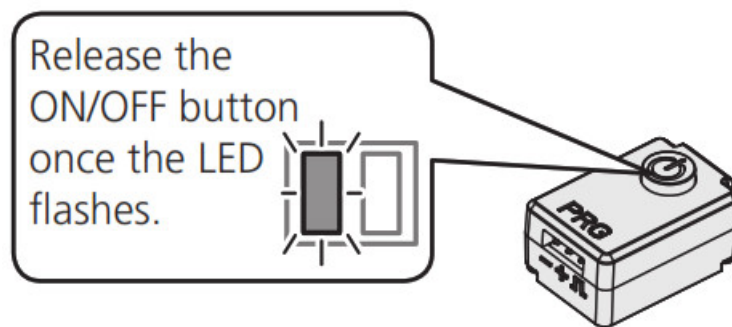
Use LED setting box to restore factory settings. The method is as follows:

After connecting the setting card and the ESC, press the “RESET” key and then press the “OK” key to save, the factory settings can be restored.

ESC Setup

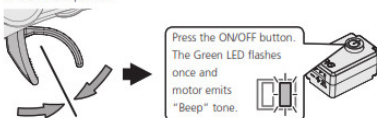
Set the Throttle Range – ESC Calibration – Radio Setup

Before the first use of ESC or after the radio changed parameters of throttle channel “TRIM” D/R EPA, the throttle range needs to be reset. Otherwise, the ESC may be unable to use or the wrong action. We strongly recommend turning on the fail-safe function, set the no signal protection function of the throttle channel “F/S” to close output mode, or set the rotation value to the midpoint position, making the motor stop running when the receiver cannot receive the signal of the radio. Adjust the throttle as following:

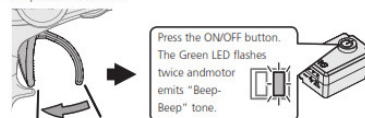


1. Turn on the radio, adjust the “D / R”, “EPA”, “ATL” of the throttle channel to 100% (if the radio has no display screen, adjust the corresponding knob to the maximum position), and adjust the “TRIM” of the throttle channel to 0 (if the remote control has no display screen, adjust the corresponding knob to the middle position). Futaba and similar radio need to set the throttle channel direction to “REV”, and the throttle channel direction of other brands radio should be set to “NOR”. Be sure to turn off the ABS brake function of the radio.
2. In the power-off state, press the power key and hold it continuously. The red light on the ESC's switch starts to flash (and the motor sounds at the same time), then release the key immediately (If the key is not released within 8 seconds, the ESC will enter other modes).

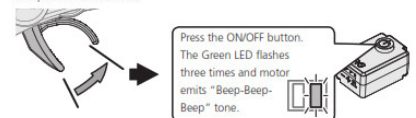
Move the throttle trigger to the neutral position



Move the throttle trigger to the end position of forward



Move the throttle trigger to the end position of backward



3. At this time, three points need to be set: the neutral position, the end position of forwarding and the end position of backward.
 - The throttle trigger stays at the neutral position, press the SET key, the red light goes out, the green light flashes once, and the motor emits a “beep” once, indicating that the neutral position has been stored.
 - Move the throttle trigger to the end position of forward, press SET key, the green light flashes twice, and the motor emits “beep” twice, indicating that the end position of forwarding has been stored.

- Push the throttle trigger to the end position of backward, press SET key, the green light flashes three times, and the motor emits “beep” three times, indicating that the end position of backward has been stored.
4. After calibrating and adjusting the throttle range, the motor can be operated normally.

Automatic Motor Pairing(Optional)

If the motor has been subjected to severe impact or has abnormal heating and abnormal power output during operation, need to do the following automatic motor pairing. The operation method is as follows:

Step 1: Pull out the throttle line from the receiver and remove the motor gear.

Step 2: Connect the battery, long press and start key, the switch of ESC will flash the red light first, then switch to green light flashing after about 8 seconds, now enter the automatic motor pairing process. The motor will automatically rotate if release the button, waits for the motor to end the rotation and the red light starts flashing, indicating that the automatic motor pairing is completed.

Step 3: After the automatic motor pairing is completed, the ESC will self-check (report Lipo Cells). Reconnect the throttle line to operate normally.

Note: Please remove the motor gear before the operation, otherwise it may lead to incorrect matching and unknown risk.

Indication for LED of ESC

1. Startup phase

- In the normal state after startup, the red light is always on.
- The red light flashes continuously and rapidly: No throttle signal is detected by the ESC or the neutral position of the ESC does not match with the radio.
- The green light flashes N times: The number of Lipo Cells detection, flashes N times indicates there are N Lipo.

2. Driving stage

- The throttle trigger is in the neutral range, and the green light goes out.
- When forwarding, the green light flashes; when the throttle is at the end position of forward, the green light is always on.
- When reversing, the green light flashes; when the throttle is at the end position of backward and the max. reverse force is set to 100%, the green light is always on.


3. When relevant protection functions are triggered, the LED status means:

- The red light flashes continuously(single flashing, “☆ ☆☆ ☆”): the ESC enters low-voltage protection status.
- Greenlight flashes continuously(single flashing, “ ”): the temperature of ESC is too high, and enters overheat protection status.

Troubleshooting

Malfunction	Cause	Solution
The indicator light is not on after the power is on, the motor cannot start.	<ol style="list-style-type: none"> 1. The battery voltage is not input to the ESC. 2. The switch of ESC is damaged. 	Check whether the power input channel has poor welding and re-weld. Replace the switch.
Power on and finish inspecting the number of Lipo cells (Greenlight flashes N times), red light flashes quickly.	<ol style="list-style-type: none"> 1. Throttle signal is not detected by the ESC. 2. The neutral position of ESC and radio is unmatched. 	<ol style="list-style-type: none"> 1. Check whether the throttle line is inserted reversely, whether the channel is inserted wrongly and whether the radio is on. 2. The throttle return to the neutral position. Recalibrate throttle range.
The radio increases throttle forward, the car reverses.	The default rotation direction setting of the motor and car frame is unmatched.	Set default rotation direction to another item via LED setting box.
The motor suddenly stops rotating or the power output reduces obviously during rotation.	<ol style="list-style-type: none"> 1. The receiver interferes. 2. The ESC enters low voltage protection 3. The ESC enters overheat protection 	<ol style="list-style-type: none"> 1. Check why the receiver interferes. Check the battery level of the transmitter. 2. Red light flashes continuously is voltage protection, please replace the battery. 3. Green light flashes continuously is temperature protection. Please use it after the temperature drops.
When the throttle is in a neutral position, the car slowly moves forward or backward.	<ol style="list-style-type: none"> 1. The middle position of the radio drifts and the signal is unstable. 2. Throttle range is not calibrated well. 	<ol style="list-style-type: none"> 1. Replace the radio with a stable signal. 2. Recalibrate throttle range or use throttle TRIM to calibrate midpoint.
When set throttle range, press Set key to set neutral position, the green light does not flash and emit "beep" sound, or after setting neutral position, it cannot set the end position of forwarding or backward.	<ol style="list-style-type: none"> 1. The throttle line of ESC has not inserted the correct channel of the receiver. 2. The throttle line of ESC is inserted reversely. 3. The throttle channel setting does not match with the ESC. 	<ol style="list-style-type: none"> 1. Insert throttle line to The Throttle channel marked by the receiver. 2. Check the receiver's mark to ensure the throttle line of ESC is inserted into the receiver correctly. 3. If it is Futaba radio, set the throttle to "REV", try to keep the ratio before and after of the throttle channel at 5:5 for other radios.

Documents / Resources

	HOBBYWING QUICRUN Motor [pdf] User Manual QUICRUN, QUICRUN Motor
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