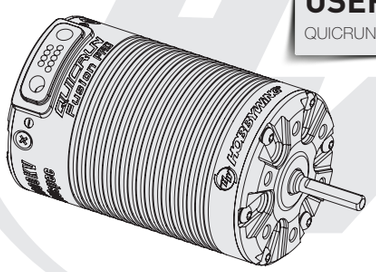
HOBBYWING®

QUICRUN USER MANUAL

QUICRUN Fusion Pro



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01 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.

02 Attentions

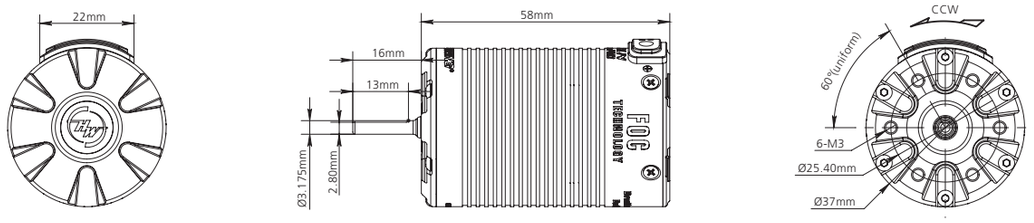
- Please make sure that all wires and connecting parts are well insulated before the ESC connected with relevant connecting parts, because short circuit will damage the ESC.
- Please connect all parts carefully. If connect improperly, you may not be able to control the vehicle normally, or the equipment will be damaged or other unpredictable situations occurs.
- 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 power system.
- If need to weld 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℃/194℉, 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 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!

03 Features

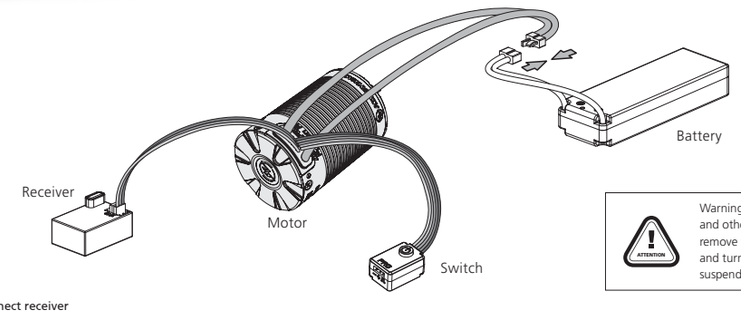
- The integrated design of the ESC and the motor greatly reduces the overall volume and weight, and makes the layout and wiring of car frame simpler and more convenient.
- The FOC driving mode, low speed torque is strong. Smooth running at extreme low speed, which is far superior to the common sensored 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 system is IP67, with excellent waterproof and dustproof performance. Under various weather conditions, the whole system 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 slope.
- With strong built-in switch mode BEC, the continuous current is up to 6A, and support switch between 6V and 7.4V, easy to drive various powerful steering servo and high-voltage steering servo.
- Multiple protection functions: battery low voltage protection, overheat protection, throttle lost protection, lock-up protection.
- It supports LED program box to set ESC parameters, and has independent parameter setting interface, which is integrated on electronic switch, making setting parameters more convenient.

04 Specifications

Model	QUICRUN Fusion Pro
Continuous / peak current	60A / 200A
Main applications	1 / 10 Crawler
Lipo Cells	2-3S Lipo, 6-9 Cells NiMH
BEC output	6V / 7.4V adjustable, continuous current 6A (Switch mode)
Size/Weight	37mm(diameter)x58mm(length) / 209g (including wires&connectors)
Programming port	Independent programming interface (switch position)
Motor KV	2300KV
Diameter / Length of motor	37mm / 58mm
Shaft diameter / exposed shaft length	3.175mm / 16mm
Motor Poles	4



05 Connections



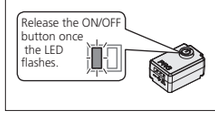
Warning: The power of the system is powerful. For the safety of you and other people around you, we strongly recommend that you remove the pinion gear before calibrating and setting the system, and turn on the control switch of the ESC when the wheel is suspended!

- **Connect receiver**
  Insert the throttle cable of the ESC into the throttle channel of receiver (that's THROTTLE channel). Because the red line of throttle cable output 6V/7.4V voltage to receiver and steering servo, do not supply power to receiver, otherwise the ESC may be damaged. If need to supply power, pick out the red line among throttle cable, wrap it and suspend.
- **Connect battery**
  The input line of the ESC has polarity. When connecting 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.

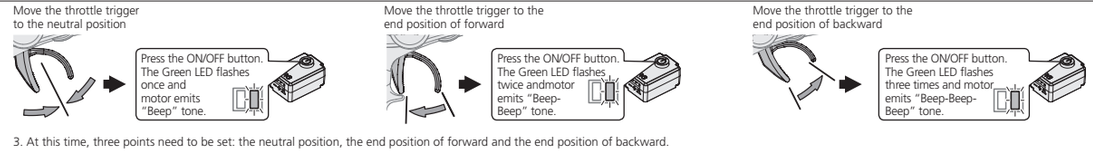
06 ESC Setup

1 Set the Throttle Range – ESC Calibration

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 wrong action. We recommend to set the fail-safe function of throttle channel ("F/S") to close output mode or set the protection value to the neutral position, making the motor stop running when the receiver cannot receive signal of the radio. The method of setting the throttle range is 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).
2. In power off state, press the power button and hold it continuously. The red light on the ESC's switch starts to flash, then release the power button immediately (If the power button is not released within 8 seconds, the ESC will enter other modes, and need to start over) , the motor will sound synchronously..



3. At this time, three points need to be set: the neutral position, the end position of forward and the end position of backward.
   - The throttle trigger stays at the neutral position, press the power button, the green light flashes once, and the motor emits "beep" once, indicating that the neutral position has been stored.
   - Move the throttle trigger to the end position of forward, press power button, the green light flashes twice, and the motor emits "beep" twice, indicating that the end position of forward has been stored.
   - Push the throttle trigger to the end position of backward, press power button, 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, the motor can be operated normally.

2 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.

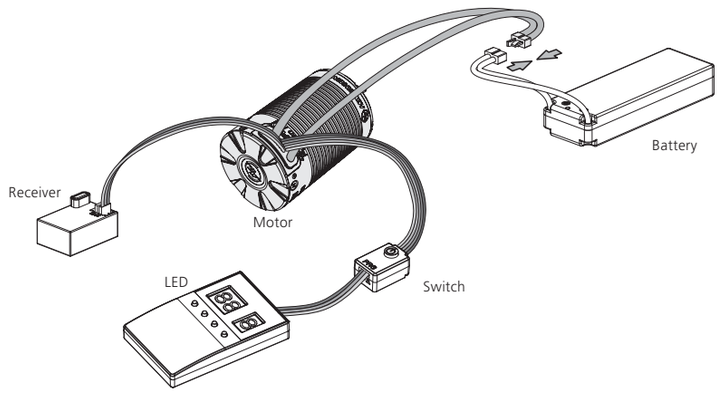
3 Instruction for programmable items

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	Running Mode	*Forward and Reverse (RPM Matching)*	Forward/Reverse with Brake (Normal mode)	Forward and Reverse (Normal mode)						
2	Lipo Cells	*Auto*	2S	3S						
3	Cutoff Voltage	Disabled	Low	*Medium*	High					
4	Thermal Protection	*105℃/221℉*	125℃/257℉							
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%*					
10	Max. Brake Force	10%	20%	30%	40%	50%	*60%*	70%	85%	100%
11	RPM Decrease Rate	*Level 1*	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9
12	Punch	Level 1	Level 2	Level 3	Level 4	*Level 5*	Level 6	Level 7	Level 8	Level 9
13	Neutral Range	4%	6%	*8%*	10%	12%				

1. Running Mode:
   Option 1: Forward/Reverse(RPM Matching)
   When the throttle trigger is pushed from neutral to reverse area, the motor reverses immediately.
   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: Forward/Reverse with Brake(Normal mode)
   When the throttle trigger is first pushed to the reverse point, the motor comes to a standstill (brake). Reverse will be activated only when the throttle trigger is back to the neutral point, and the second push to the reverse point. The purpose of this is to prevent the vehicle from reversing by mistake due to multiple attempts during driving.
   Like common sensored brushless or brushed 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.
   Option 3: Forward/Reverse(Normal mode)
   When the throttle trigger is pushed from neutral to reverse area , the motor reverses immediately.
   Like common sensored brushless or brushed 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 judgement. 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 have 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 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, and the power will be completely closed after 30 seconds. When entering the low-voltage protection, the red LED will blink in the way of "☆—, ☆—, ☆—" in single cycle. When set to "Disabled", there will be no low voltage protection function, for NiMH batteries,you can set this parameter to "Disabled". The low, medium and high options correspond to 3.0V/Cell,3.25V/Cell,3.5V/Cell.
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 correct. If the rotation direction is wrong, change to the reverse direction.
6. BEC Voltage:
   Option 1: 6.0V
   Apply to ordinary servo, if use 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 options of drag brake force to adjust, "Disabled" means the drag brake force is 0;the corresponding drag brake force increases from level 1 to level 8. 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 as slow brake. This value has 9 options to adjust. The higher the level is, the greater the drag brake rate is. Reasonably set this value can make the vehicle stop more stably.
9. Max. Reverse Force:
   Select different parameter value can produce different max. reverse force.
10. Max.Brake Force:
    The ESC provides proportional braking function, with the size of the braking force and the position of the throttle trigger relatable. The maximum braking force refers to the braking position when the brake is applied. Depending on the vehicle, select the appropriate maximum braking force.
11. RPM Decrease Rate:
    This refers to the speed of rpm change when reducing the throttle (from high to low throttle) in the normal mode. The higher the value, the faster the change. If you want to achieve the experience of natural sliding when reducing the throttle like normal brushless power, this value needs to be set to small.
    Note: this parameter is only valid for normal running mode.
12. Punch:
    This item is used to control the throttle response. Set in 1-9 stages, the higher the set value, the faster the acceleration. Kindly take into consideration according to the site, tire grip characteristics, vehicle configuration, etc. An aggressive setting may cause the tire to slip, the starting current to be too large and adversely affect the electronics performance.
13. Neutral Range:
    As not all transmitters have the same stability at "neutral position", please adjust this parameter as per your preference. You can adjust to a bigger value when this happens.

4 Parameter setting method



Use LED program box to set ESC parameters
It is easy and fast to read and set parameters via a LED program box. 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 - + ʊ 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" button on the programming card can quickly select the programming items and parameter values, press "OK" button to save the new parameters in ESC.

5 Factory reset

Use LED program box to restore factory settings. The method is as follows:
After connect program box and the ESC, press "RESET" button and then press "OK" button to save, the factory settings can be restored.

6 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:
Connect the battery, press and hold the button on the power switch,the red light will flash first, then switch to green light flashing after about 8 seconds, now you can release the button, the motor will enter the automatic pairing process,after about 5 seconds, the system will restart and self-check(report Lipo cells), which indicates that the pairing is completed.

07 Indication for LED of ESC

1. Startup stage
   - In the normal state after power on, 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 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.
   - Green light flashes continuously(single flashing, "☆, ☆, ☆"): the temperature of ESC is too high, and enters overheat protection status.

08 Troubleshooting

Malfunction	Cause	Solution
The indicator light is not on after power on, the motor cannot start.	1. The battery voltage is not input to the ESC; 2. The switch of ESC is damaged.	1. Check whether the connection between the battery and the esc is good, whether the plug is soldered poorly, whether there is a problem with the battery; 2.Replace the switch.
Power on and finish inspecting the number of Lipo cells (Green light flashes N times), red light flashes quickly.	1. Throttle signal is not detected by the ESC; 2. The neutral position of ESC and radio is unmatched.	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 neutral position. Recalibrate throttle range.
The car is going in the reversed direction when the forward.	The default rotation direction setting of motor and car frame is unmatched.	Set the parameter item "Motor Rotation" to the opposite direction via LED program box.
The motor suddenly stopped or significantly reduced the output in running.	1. The receiver is interfered; 2. The ESC enters low voltage protection; 3. The ESC enters overheat protection.	1. Check why the receiver is interfered. Check battery level of transmitter; 2. Red light flashes continuously is low voltage protection, please replace battery; 3. Green light flashes continuously is overheat protection. Please use it after the temperature drops.
When the throttle is in neutral position, the car slowly moves forward or backward.	1. The middle position of radio drifts and the signal is unstable; 2. Throttle range is not calibrated well.	1. Replace a radio with stable signal; 2. Recalibrate throttle range or use throttle TRIM to calibrate midpoint.
The throttle range setting could not be completed.	1. The throttle cable of esc is not inserted the correct channel of receiver, or inserted reversely; 2. Problem with the receiver or transmitter.	1. Check whether the throttle cable is correctly connected to the receiver; 2. If the servo works normally,you can connect the throttle cable of esc to the steering channel to have a test, or change the transmitter/receiver system for test directly.