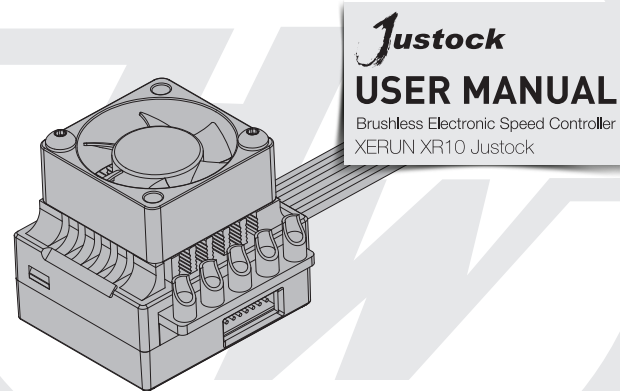




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01 Introduction



Thank you for purchasing the XR10 Justock, HOBBYWING's high performance sensorless brushless motor electronic speed controller! Brushless power systems can be very dangerous. 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. Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damage or losses resulting from the use of the product. We do not assume responsibility for any losses caused by unauthorized modifications to our product. We, HOBBYWING, are only responsible for our product cost and nothing else as result of using our product.

02 Warnings

- Ensure all wires and connections are well insulated before connecting the ESC to related devices, as short circuit will damage your ESC.
- Ensure all devices are well connected, in order to prevent poor connections that may cause your vehicle to lose control or other unpredictable issues like damage to the device.
- Read through the manuals of all power devices and chassis and ensure the power configuration is rational before using this unit.
- Please use a soldering iron with the power of at least 50W to solder all input/output wires and connectors.
- Stop using the ESC when its casing temperature exceeds 90 C/194 F; otherwise your ESC will get destroyed and may also get your motor damaged.
- Always disconnect and remove batteries after use, as the ESC will continue to consume current if it's still connected to batteries (even if the ESC is turned off). Long-time contact will cause batteries to completely discharge and result in damage to batteries or ESC or both. This will not be covered under warranty.)

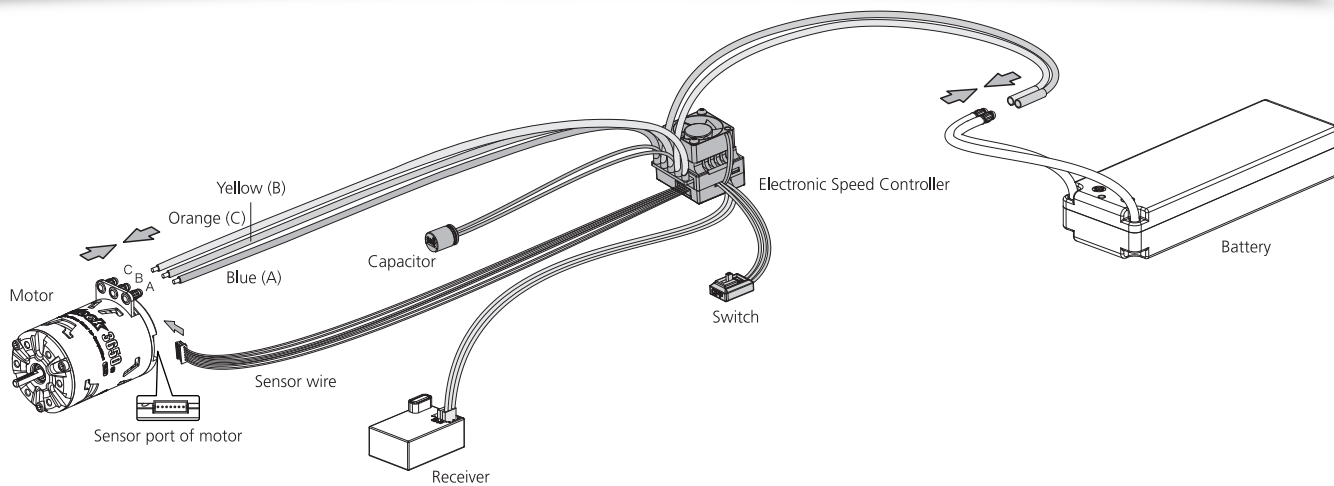
03 Features

- Compact design for easy installation.
- Compatible with sensored/sensorless brushless motors. In sensored mode, it's compatible with most popular sensored brushless motors on the market. In sensorless mode, it's compatible with 99% of brushless motors on the market.
- Aluminum housing top with excellent heat dissipation and great current endurance.
- The timing has been permanently set to 0 degree. With the identical competition motor, this ensures that every driver will have the same power system and have a really just STOCK race.
- Proportional brake with 4 steps of maximum brake force, 8 steps of drag brake force and 4 steps of initial brake force.
- 9 levels of acceleration/punch from "soft" to "aggressive" for different vehicles, tires and tracks.
- Multiple protections: motor lock-up protection, low-voltage cutoff protection, thermal protection and fail safe (throttle signal loss protection).
- Single-button ESC programming and factory reset.
- Advanced programming via portable LED program card or multifunction LCD program box.
- Firmware upgrade via HOBBYWING multifunction LCD program box (item sold separately).
- Supports six RPM speed limit functions, including 25000 RPM, 22500 RPM, 20000 RPM, 17500 RPM, 15000 RPM, 12500 RPM, which can be burnt to the corresponding RPM limited Firmware via USB LINK software.

04 Specifications

Model	XERUN XR10 Justock
Cont./Peak Current	60A / 380A
Motor Limit	Sensored / Sensorless Brushless Motor
Applications	1/10", 1/12" on-road & off-road CLUB competition and normal training
(Motor) KV Limit	Brushless Motor Limit 2S LiPo/4-6S NiMH: >=8.5T (1/10 on-road), >=11.5T (1/10 off-road) Brushless Motor Limit 3S LiPo/8-9S NiMH: >=13.5T (1/10 on-road), >=17.5T (1/10 off-road)
LiPo/NiMH Cells	2-3S LiPo/4-9S NiMH
BEC Output	6V, 2A (Line-mode BEC)
Fan (Included)	Powered by the stable BEC output voltage of 6V
Connectors	Input End: No Connectors; Output End: No Connectors
Size/Weight (mm/g)	33.5mm(L) x 28.5mm(W) x 30.5mm(H) / 59.8g
ESC Programming	Via the Rx Cable (or Throttle Control Cable)

05 Connections



This is an extremely powerful brushless motor system. For your safety and the safety of those around you, we strongly recommend removing your pinion gear before performing calibration and programming functions with this system, and keeping wheels in the air when you turn on the ESC.

1. Motor Wiring

The sensored motor wiring is a little different from the sensorless motor wiring; please make sure that you will strictly follow the introductions below.

A. Sensored Motor Wiring

There is strict wiring order from the ESC to the motor, the three A/B/C ESC wires must connect to the three A/B/C motor wires correspondingly and then connect the ESC sensor port and the motor sensor port with the stock 6-pin sensor cable.

Note 1: If you don't plug the sensor cable in, your ESC will still work in sensorless mode even if you're using a sensored motor.

B. Sensorless Motor Wiring

There is no polarity on the A/B/C wires between ESC and motor, so do not worry about how you connect them initially. You may find it necessary to swap two wires if the motor runs in reverse.

2. Receiver Wiring

Plug the throttle control cable (also called Rx cable) on the ESC into the throttle (TH) channel on receiver. The red wire in the throttle control cable will output the BEC voltage of 6V to the receiver and servo, so please do not connect any additional battery to the receiver. Otherwise, your ESC may be damaged.

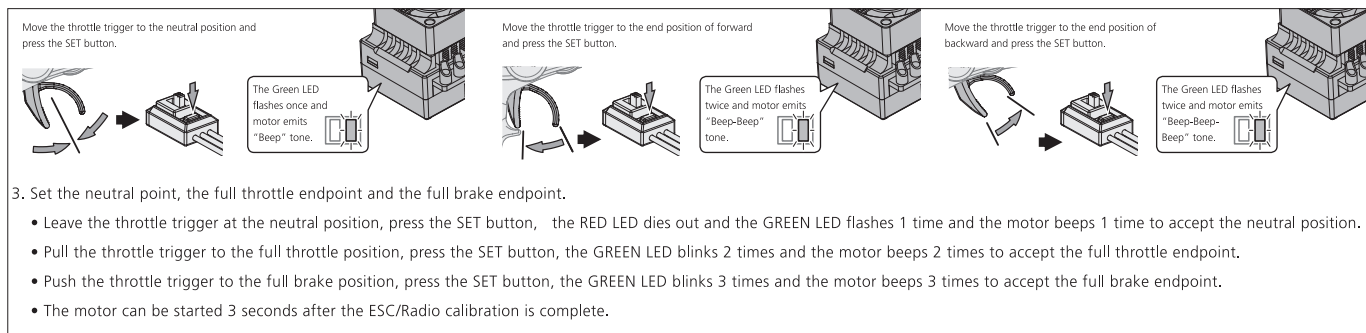
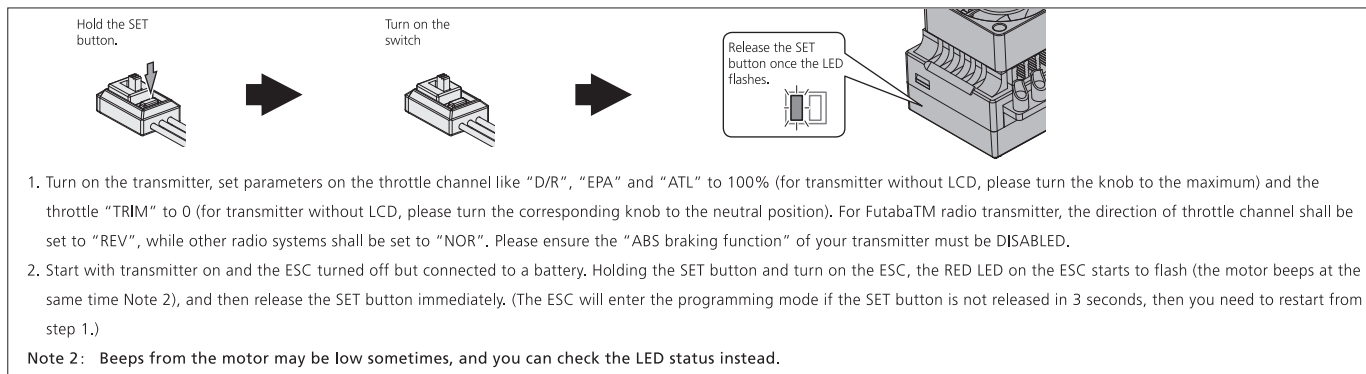
3. Battery Wiring

Proper polarity is essential here! Make absolutely sure positive (+) of ESC connects to positive (+) of battery, and negative (-) of ESC connects to negative (-) of battery when you plug in your battery! If reverse polarity is applied to your ESC from the battery, it will damage your ESC. This will not be covered under warranty!

06 ESC Setup

1 ESC/Radio Calibration

In order to make the ESC match the throttle range, you must calibrate it when you begin to use a new ESC, or a new transmitter, or after you change the settings such as the TRIM, D/R, EPA and other parameters of throttle channel on your transmitter, otherwise the ESC cannot work properly. We strongly recommend activating the "Fail Save" function of the radio system and set it (F/S) to "Output OFF" or set its value to the "Neutral Position" to ensure the motor can be stopped when there is no signal received from the transmitter. About setting the throttle range, let's take FutabaTM transmitter as an example.



2 Warning Tones

Turn on the ESC in the normal way (that is to turn it on without holding the SET button); the motor will beep the number of LiPo cells you have plugged in. For example, 2 beeps indicate a 2S LiPo, 3 beeps indicate a 3S LiPo.

3 Programmable Items

(Those "black background and white text" options are the factory default settings)

Programmable Items	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Running Mode	Forward with Brake	Forward/Reverse with Brake	Forward/Reverse (For Rock Crawler)						
2. Drag Brake Force	0%	5%	10%	20%	40%	60%	80%	100%	
3. Cutoff Voltage	Disabled	2.6V/Cell	2.8V/Cell	3.0V/Cell	3.2V/Cell	3.4V/Cell			
4. Start Mode (Punch)	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9
5. Max Brake Force	25%	50%	75%	100%					
6. Max Reverse Force	25%	50%	75%	100%					
7. Initial Brake Force	= Drag Brake Force	0%	20%	40%					
8. Neutral Range	6% (Narrow)	9% (Normal)	12% (Wide)						
9. Timing	This item has been permanently set to 0 degree.								
10. Overheat Protection	Enabled	Disabled							

1. Running Mode

Option 1: Forward with Brake

The vehicle can go forward and brake but cannot reverse in this mode. This mode is usually for racing.

Option 2: Forward/Reverse with Brake

This mode provides the braking function, it's usually for training. "Forward/Reverse with Brake" mode adopted the "DOUBLE-CLICK" method, that is your vehicle only brakes (won't reverse) when the 1st time you push the throttle trigger forward (away from you) (1st push). If the motor stops when you quickly release the throttle trigger and then re-push the trigger quickly (2nd push), the vehicle will reverse. If the motor does not stop, then your vehicle won't reverse but brake, you need to push the throttle trigger one more time. The vehicle only reverses after the motor stops. This method is for preventing vehicle from being accidentally reversed.

Option 3: Forward/Reverse

This mode used the "SINGLE-CLICK" method to make the car go backward. When you move the throttle trigger from forward zone to backward zone, the car will go backward immediately. This mode is usually used by special vehicles like the rock crawler.

2. Drag Brake Force

Drag brake is the braking power produced when releasing the throttle trigger to neutral zone. This is to simulate the slight braking effect of a neutral brushed motor while coasting.

(Attention! Drag brake will consume much power, so please apply it cautiously.)

3. Cutoff Voltage (or Low Voltage Cutoff Threshold)

Sets the voltage at which the ESC lowers or removes power to the motor in order to keep the LiPo battery at a safe minimum voltage. The ESC will monitor the battery voltage all the time, it will gradually reduce the power to 30% in 3 seconds (at this time, racer should pull the car aside and drop out of the race immediately to avoid blocking the track or hitting by some car comes behind,) and cutoff the output 10 seconds later when the voltage goes below the cutoff threshold. The RED LED will flash a short, single flash that repeats (↖↗, ↖↗, ↖↗) to indicate the low-voltage cutoff protection is activated. If necessary, you can customize the cutoff voltage at the precise step of ±0.1V through a multifunction LCD program box (item sold separately) for different battery packs like NiMH, LiFe and etc.

4. Start Mode / Punch / Acceleration

You can choose the punch from level 1 (very soft) to level 9 (very aggressive) as per the track, tires, grip, your preference and etc. This feature is very useful for preventing tires from slipping in the starting-up process. In addition, "level 7", "level 8" and "level 9" have strict requirement on battery's discharge capability. It may affect the starting-up if the battery discharges poorly and cannot provide large current in a short time. The car stutters or suddenly loses power in the starting-up process indicating the battery's discharge capability is not good; you need to reduce the punch or increase the FDR (Final Drive Ratio).

5. Brake Amount/ Max. Brake Force

This ESC provides the proportional braking function; the braking effect is determined by the position of the throttle trigger. It sets what percentage of available braking power is applied with full brake. Large amount will shorten the braking time but it may damage your pinion and spur. Please select the most suitable brake amount as per your car condition and your preference.

6. Reverse Amount/ Max. Reverse Force

Different reverse amount will bring different reversing speed. For the safety of your vehicle, we recommend using a low amount.

7. Maximum Reverse Force:

Sets how much power will be applied in the reverse direction. Different value makes different reverse speed.

8. Throttle Neutral Range

Adjust the throttle neutral zone as per your preference (as shown). Because the neutral position on some transmitters is not stable and it can cause the vehicle to go forward/backward slowly, so please set the throttle neutral width to a bigger value when this issue happens.

9. Timing:

This item has been permanently set to "0" degree.

10. Overheat Protection:

If this item is activated, the output will be automatically cut off when the ESC temperature or the internal temperature of the sensored brushless motor goes above the factory preset value. The Green LED will flash when this protection is activated. The output won't resume until the ESC/motor cools down.

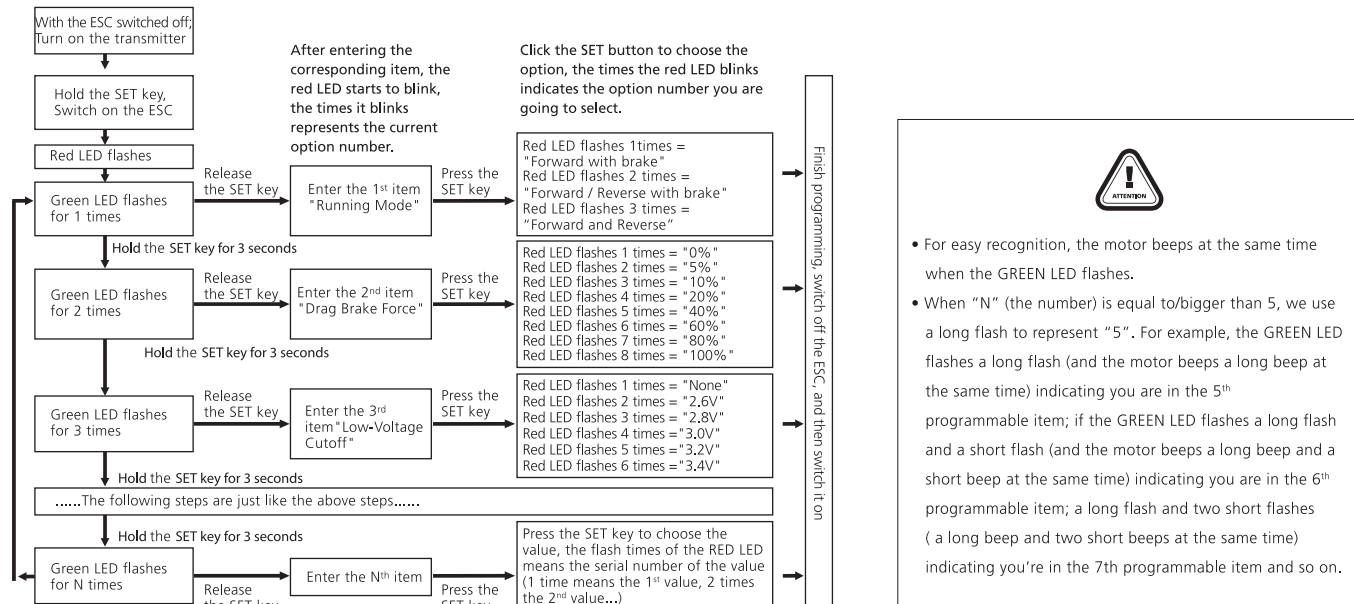
When the ESC is overheated, the Green LED will flash a short, single flash that repeats "↖↗, ↖↗, ↖↗".

When the motor is overheated, the Green LED will flash a short, double flash that repeats "↖↗↖↗, ↖↗↖↗, ↖↗↖↗".

Note: The motor overheat protection is only available to the sensored brushless motor manufactured by the same manufacturer of this ESC. For motors made by other manufacturers, this function may not be available or the protection point doesn't match the design of the ESC, please disable the overheat protection in this case.

4 ESC Programming

1. Programming your ESC with the SET button



2. Program your ESC with a LED program box

(For detailed information, please refer to the user manual of the LED program box.)

The portable program card is an optional accessory applicable for field use. Its friendly interface makes the ESC programming easy and quick. Before the programming, you need to unplug the throttle control cable (or Rx cable) from the receiver and plug it into the programming/ESC port on the program box, and then turn on the ESC, all programmable items will show up a few seconds later. You can select the item you want to program and the setting you want to choose via "ITEM" & "VALUE" buttons on the program card, and then press the "OK" button to save all new settings to your ESC.

3. Program your ESC with a multifunction LCD program box

(For more information, please refer to the user manual of the LCD program box.)

You can program this ESC through a 3-in-1 LCD program box or through a 3-in-1 LCD program box and a PC (HOBBYWING USB LINK software needs to be installed on the PC). Before the programming, you need to unplug the throttle control cable (or Rx cable) from the receiver and plug it into the programming/ESC port on the program box, then the boot screen will show up on the LCD, press any button on the program box to initiate the communication between your ESC and the program box. The "CONNECTING ESC" will be displayed, a few seconds later, the program box will display the current mode like profile 1 and then the 1st programmable item like running mode. You can adjust the setting through "ITEM" & "VALUE" buttons, and then press the "OK" button to save new settings to your ESC.

5 Factory Reset

• Restore the default values with the SET button

Press and hold the SET button for over 3 seconds anytime when the throttle trigger is at the neutral position (except during the ESC calibration and programming) can factory reset your ESC. RED & GREEN LEDs flash simultaneously indicating you have successfully restored all the default values within your ESC. Once you power the ESC off, and then back on, your settings will be back in the default mode.

• Restore the default values with the LED program box

After connecting the program box to the ESC, press the "RESET" button and the "OK" button to factory reset your ESC.

• Restore the default values with a multifunction LCD program box

After connecting the program box to the ESC, continuously press the "ITEM" button on the program box until you see the "RESTORE DEFAULT" item, and then press "OK" to factory reset your ESC.

07 Explanations for Different Status LEDs

1. During the Start-up Process

- The GREEN LED flashes "N" times indicating the number of LiPo cells you have connected to the ESC.

2. In Operation

- The throttle trigger is at the neutral position.
 - 1.1 Red LED flashes rapidly in Blinky mode.
 - 1.2 In RPM speed limit mode, when RPM limit is 25,000, the red LED is always on once and the green LED flashes once.
 - 1.3 In RPM speed limit mode, when RPM limit is 22,500, the red LED is always on once and the green LED flashes twice.
 - 1.4 In RPM speed limit mode, when RPM limit is 20,000, the red LED is always on once and the green LED flashes three times.
 - 1.5 In RPM speed limit mode, when RPM limit is 17,500, the red LED is always on once and the green LED flashes four times.
 - 1.6 In RPM speed limit mode, when RPM limit is 15,000, the red LED is always on once and the green LED flashes five times.
 - 1.7 In RPM speed limit mode, when RPM limit is 12,500, the red LED is always on once and the green LED flashes six times.
- Red LED is on eternally when moving forward. Green LED is also on when throttle trigger is at the end position of forward (100% throttle, on non-speed limit mode).
- The RED LED turns on solid when you brake your vehicle. The GREEN LED will also come on when pushing the throttle trigger to the full brake endpoint and setting the "brake amount/maximum brake force" to 100%.
- The RED LED turns on solid when you reverse your vehicle.
- Some Protection is Activated
 - The RED LED flashes a short, single flash that repeats (↖↗, ↖↗, ↖↗) indicating the low voltage cutoff protection is activated.
 - The GREEN LED flashes a short, single flash that repeats (↖↗, ↖↗, ↖↗) indicating the ESC thermal / overheat protection is activated.
 - The GREEN LED flashes a short, double flash that repeats (↖↗↖↗, ↖↗↖↗, ↖↗↖↗) indicating the motor thermal / overheat protection is activated.

08 Trouble Shooting

Trouble(s)	Possible Causes	Solution(s)
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 ESC was unable to start the motor after it was powered on, but the motor emitted a short, double beep (BB, BB, BB,...) that repeats with GREEN LED on the ESC blinked. (The interval between two beeps was 1 second.)	The battery voltage was beyond the normal operating voltage range of the ESC.	Check the battery voltage.
ESC was unable to start the motor after it was powered on, but the red LED turned on solid.	1. Throttle signal was abnormal. 2. The transmitter and receiver were not well bound.	1. Check if the throttle wire is reversely plugged in or in the wrong channel and if the transmitter is turned on. 2. Rebind the transmitter and receiver by referring to the user manual of the radio system.
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 LVC protection. 3. The GREEN LED keeps flashing indicating the thermal protection is activated.	1. Check all devices and try to find out all possible causes, and check the transmitter's battery voltage. 2. The RED LED keeps flashing indicating the LVC protection is activated, please replace your pack. 3. The GREEN LED keeps flashing indicating the thermal protection is activated, please let your ESC cool down before using it again.
The motor stuttered but couldn't start.	1. The wire connections between the motor and ESC were not A-A, B-B and C-C. 2. Some soldering between the motor and the ESC was not good. 3. The ESC was damaged (some MOSFETs were burnt).	1. Check the connections 2. Check all soldering points, please re-solder if necessary. 3. Contact the distributor for repair or other customer services.
The vehicle could run forward (and brake), but could not reverse.	1. The throttle neutral position on your transmitter was actually in the braking zone. 2. Set the "Running Mode" improperly. 3. The ESC was damaged.	1. Re-calibrate the throttle neutral position. No LED on the ESC will come on when the throttle trigger is at the neutral position. 2. Set the "running mode" to "Forward/Reverse with Brake". 3. 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.
When pressing the SET button to set the throttle neutral position, the GREEN LED didn't flash and no beep was emitted, or you were unable to set the full throttle endpoint and the full brake endpoint after the neutral position was accepted.	1. The ESC throttle cable wasn't plugged in the correct channel on the receiver. 2. The ESC throttle cable was reversely plugged in.	1. Plug the throttle cable into the throttle (TH) channel on your receiver. 2. Plug in the throttle cable properly by referring to relevant mark shown on your receiver.