

【FEATURES】

- 1. Specially designed for RC car RTR (Ready to Run) application.
- 2. Excellent start-up, acceleration and linearity features.
- 3. Compatible with sensorless brushless motor.
- 4. Running modes: Forward mode (single direction) and Forward/Backward mode (dual directions)
- 5. Proportional ABS brake function, with 4 steps of maximum brake force adjustment, 8 steps of drag-brake force adjustment.
- 6. Different options of start modes (Also called “Punch”) from “soft” to “aggressive”.
- 7. Multiple protection features: Low voltage cut-off protection for lithium or nickel battery / Over-heat protection / Throttle signal loss protection / Motor blocked protection.
- 8. Splash proof and dustproof.

【SPECIFICATIONS】

Model	S18 RTR	S16 RTR	S10A/B RTR	S10C/D RTR	S8A RTR	S8B RTR
Suitable Car	1/18 car	1/16 car	1/10 On-Road	1/10 Off-Road	1/8 Buggy/Truggy	1/8 Truggy/Monster
Battery	4-9 cells NiMH or 2-3S Lipo				2-4S Lipo	2-6S Lipo
Cooling Fan	N/A	N/A	S10A: N/A S10B/C/D: 5V		5V	5V
	For 4-6 cells NiMH or 2S Lipo: Just use the cooling fan pre-installed on ESC; For 7-9 cell NiMH or 3S Lipo: Please choose a high voltage cooling fan or supply the fan from the receiver; (Please check the instructions on page 3)				The cooling fan gets power supply from built-in BEC	The cooling fan gets power supply from built-in BEC
Suitable Brushless Motor	2S Lipo On-road: ≥12T Off-road: ≥18T 2030 size motor	2S Lipo On-road: ≥12T Off-road: ≥18T 2030 size motor	2S Lipo On-road: ≥9T Off-road: ≥12T 3650 size motor	2S Lipo On-road: ≥5.5T Off-road: ≥8.5T 3650 size motor	4S Lipo KV ≤ 2400 4074 size motor	4S Lipo KV ≤ 2400 4074 size motor
	3S Lipo On-road: ≥18T Off-road: ≥24T 2030 size motor	3S Lipo On-road: ≥18T Off-road: ≥24T 2030 size motor	3S Lipo On-road: ≥12T Off-road: ≥18T 3650 size motor	3S Lipo On-road: ≥8.5T Off-road: ≥13.5T 3650 size motor		6S Lipo KV ≤ 2000 4274 size motor
BEC Output	6V@1A	6V@1.5A	6V@1.5A	6V@3A	5.75V@3A	5.75V@3A
Motor Type	Sensorless Brushless Motor					
Dimension	31.5* 24* 15	31.5* 27.5* 16	31.5*27.5*30	31.5*27.5*33	58*46*35	58*46*35

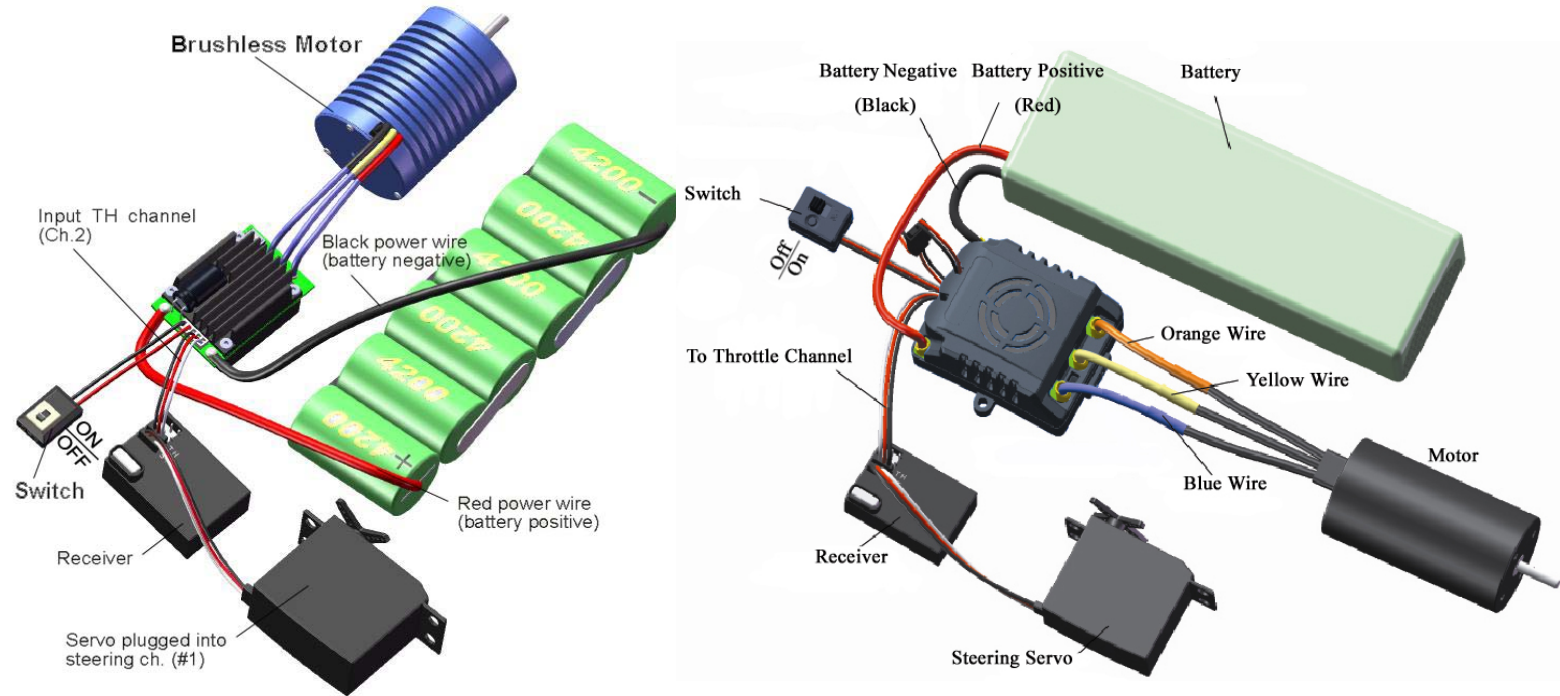
【BEGIN TO USE THE NEW ESC】

1. Connect the ESC, motor, receiver, battery and servo according to the following diagrams

“+” and “-” wires of the ESC are connected with the battery pack, and #A, #B and #C are connected with the motor wires. The control cable of the ESC (trio wires with black, red and white color) is connected with the throttle channel of the receiver (Usually CH2).

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

The “SET” button is used for programming the ESC.



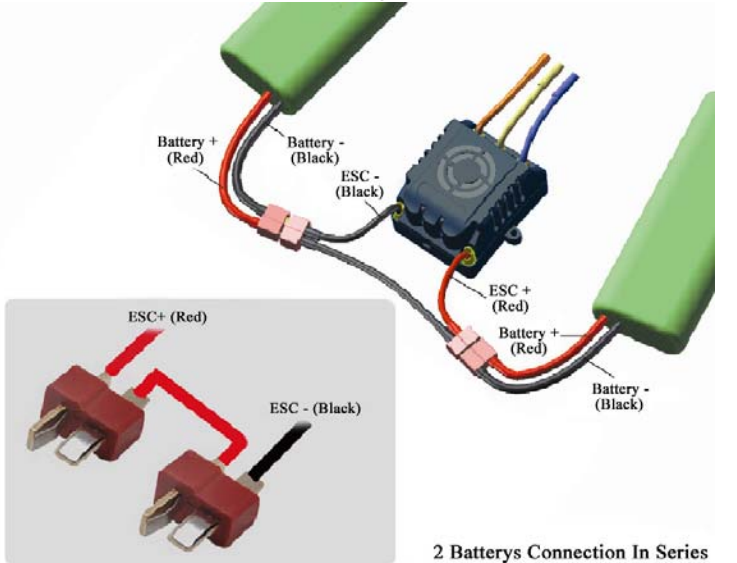
If there are 2 battery packs need to be connected in series, please refer to the following picture:

2. Throttle Range Setting (Throttle Range Calibration)

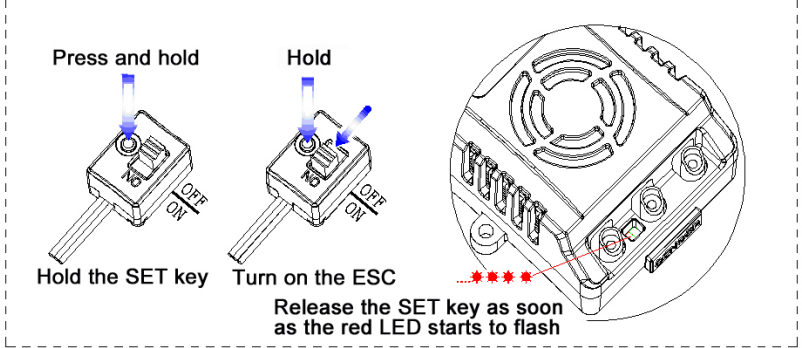
- In order to make the ESC fit the throttle range of your transmitter, you must calibrate it for the following cases; otherwise the ESC cannot work properly.
- 1) Begin to use a new ESC;
 - 2) Begin to use a new transmitter;
 - 3) Change the settings of neutral position of the throttle stick, ATV or EPA parameters, etc.

There are 3 points need to be set, they are the end point of “forward”, the end point of ” backward” and the neutral point.

The following pictures show how to set the throttle range with a Futaba™ transmitter.



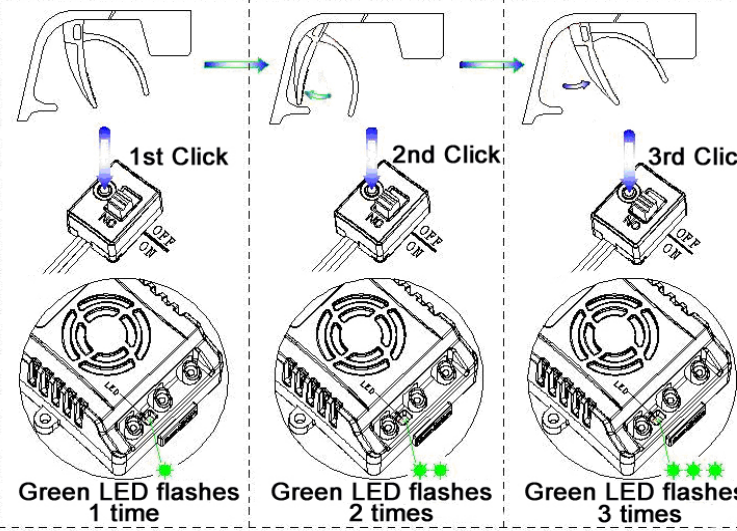
- A) Switch off the ESC, turn on the transmitter, set the direction of throttle channel to “REV”, set the “EPA/ATV” value of throttle channel to “100%”, and disable the ABS function of your transmitter.
- B) Hold the “SET” key (Note1) and then switch on the ESC, and release the “SET” key as soon as the red LED begins to flash. (Note2)



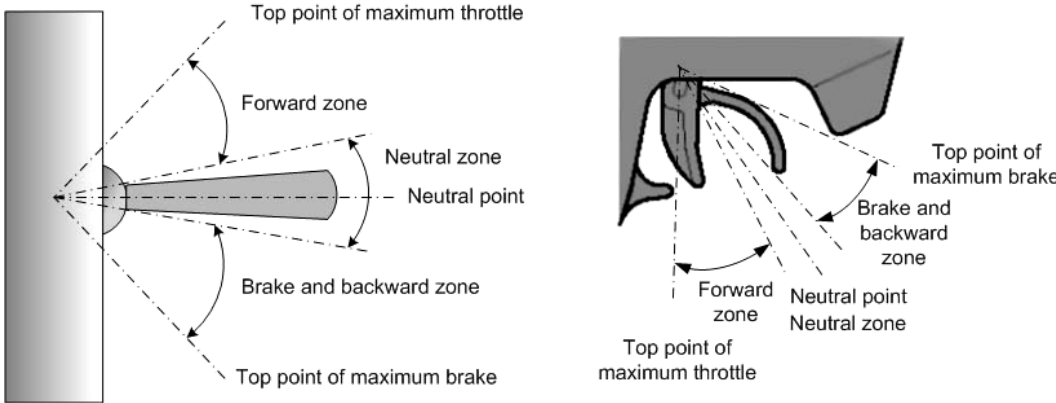
Note1: The “SET” key of S18 and S8 ESC is beside the main switch of the controller.
The “SET” key of S16, S10B/C/D ESC is located on the main board of the controller.

Note2: If you don't release the “SET” key as soon as the red LED begins to flash, the ESC will enter the program mode, in such a case, please switch off the ESC and re-calibrate the throttle range again from step A to step D.

- C) Set the 3 points according to the steps shown in the pictures on the right side.
 - 1) **The neutral point**
Move the throttle stick at the neutral point, and then click the SET key, the green LED flashes 1 time.
 - 2) **The end point of forward direction**
Move the throttle stick at the end point of forward direction, and then click the SET key, the green LED flashes 2 times.
 - 3) **The end point of backward direction**
Move the throttle stick at the end point of backward direction, and then click the SET key, the green LED flashes 3 times.
- D) Throttle range is calibrated; motor can be started after 3 seconds.



3. Throttle Range Explanation



【LED STATUS IN NORMAL RUNNING】

1. In normal use, if the throttle stick is in the neutral range, neither the red LED nor the green LED lights.
2. The red LED lights when the car is running forward or backward and it will flash quickly when the car is braking.
3. The green LED lights when the throttle stick is moved to the top point of the forward zone.

【ALERT TONES】

1. Input voltage abnormal alert tone: The ESC begins to check the input voltage when power on, if it is out of the normal range, such an alert tone will be emitted: “beep-beep-, beep-beep-, beep-beep-” (There is 1 second time interval between every “beep-beep-” tone).
2. Throttle signal abnormal alert tone: When the ESC can’t detect the normal throttle signal, such an alert tone will be emitted: “beep-, beep-, beep-” (There is 2 seconds time interval between every “beep-” tone).

【PROTECTION FUNCTION】

1. Low voltage cut-off protection: If the voltage of a lithium battery pack is lower than the threshold for 2 seconds, the ESC will cut of the output power. Please note that the ESC cannot be restarted if the voltage of each lithium cell is lower than 3.5V.
For NiMH battery packs, if the voltage of the whole NiMH battery pack is higher than 9.0V but lower than 12V, it will be considered as a 3S lithium battery pack; If it is lower than 9.0V, it will be considered as a 2S lithium battery pack. For example, if the NiMH battery pack is 8.0V, and the threshold is set to 2.6V/Cell, so it will be considered as a 2S lithium battery pack, and the low-voltage cut-off threshold for this NiMH battery pack is 2.6*2=5.2V.
2. Over-heat protection: When the temperature of the ESC is over a factory preset threshold for 5 seconds, the ESC will cut off the output power. When the over-heat protection happens, the Green LED will flash in such a style: “☆☆, ☆, ☆” (Single flash).
3. Throttle signal loss protection: The ESC will cut off the output power if the throttle signal is lost for 0.2 second.

【PROGRAM THE ESC】

1. **Programmable Items List** *(The italics texts in the form are the default settings)*

Table A: Programmable Items for S8A, S8B RTR ESC									
Programmable Items	Options								
	1	2	3	4	5	6	7	8	9
1. Running Mode	Forward with Brake	<i>Forward/Reverse with Brake</i>	Forward and Reverse						
2.Drag Brake Force	<i>0%</i>	5%	10%	20%	40%	60%	80%	100%	
3.Low Voltage Cut-Off Threshold	Non-Protection	2.6V/Cell	2.8V/Cell	<i>3.0V /Cell</i>	3.2V /Cell	3.4V /Cell			
4.Start Mode(Punch)	Level1	Level2	Level3	Level4	<i>Level5</i>	Level6	Level7	Level8	Level9
5.Max Brake Force	25%	<i>50%</i>	75%	100%	Disable				

Table B: Programmable Items For S18,S16,S10A,S10B,S10C,S10D RTR ESC								
Programmable Items	Programmable Value							
	1	2	3	4	5	6	7	8
1. Running Mode	Forward with Brake	<i>Forward/Reverse with Brake</i>						
2.Drag Brake Force	0%		10%	15%	20%	25%	30%	40%
3.Low Voltage Cut-Off Threshold	Non-Protection	<i>2.6V/Cell</i>	2.8V/Cell	3.0V /Cell	3.2V /Cell	3.4V /Cell		
4.Start Mode(Punch)	Level1	Level2	<i>Level3</i>	Level4				
5.Maximum Brake Force	25%	50%		100%				

2. Explanation For Each Programmable Item

2.1. **Running Mode:** With “Forward with Brake” mode, the car can go forward and brake, but cannot go backward, this mode is suitable for competition; “Forward/Reverse with Brake” mode provides backward function, which is suitable for daily training.
Note: “**Forward/Reverse with Brake**” mode uses “**Double-click**” method to make the car go backward. When you move the throttle stick from forward zone to backward zone for the 1st time (The 1st “click”), the ESC begins to brake the motor, the motor speeds down but it is still running, not completely stopped, so the backward action is NOT happened immediately. When the throttle stick is moved to the backward zone for the 2nd time (The 2nd “click”), if the motor speed is slowed down to zero (i.e. stopped), the backward action will happen. The “Double-Click”

method prevents mistaken reversing action when the brake function is frequently used in steering.
By the way, in the process of brake or reverse, if the throttle stick is moved to forward zone, the motor will run forward at once.
“**Forward/Reverse**” mode uses “**Single-click**” method to make the car go backward. When you move the throttle stick from forward zone to backward zone, the car will go backward immediately. This mode is usually suitable for Rock Crawler.

2.2. **Drag Brake Force:** Set the amount of drag brake applied at neutral throttle to simulate the slight braking effect of a neutral brushed motor while coasting.

2.3. **Low Voltage Cut-Off:** The function prevents the lithium battery pack from over discharging. The ESC detects the battery’s voltage at any time, if the voltage is lower than the threshold for 2 seconds, the output power will be reduced 70%, 10 seconds later the output will be completely stopped, and the red LED flashes in such a style: “☆☆, ☆☆☆, ☆☆☆” (Double flashes).

2.4. **Start Mode (Also called “Punch”):** Select from “Level1” to “Level9” (For S8 ESC) or “Level1” to “Level4” (For S18, S16 and S10A/B/C/D ESC). Higher number means more aggressive start effect. Please note that if you choose “Level7” to “Level9” mode, you must use good quality battery pack with powerful discharge ability, otherwise these modes cannot get the burst start effect as you want. If the motor runs hardly (trembling), it may caused by the weak discharge ability of the battery pack, please choose a better battery or increase the gear rate (Use a smaller pinion).

2.5. **Maximum Brake Force:** The ESC provides proportional brake function. The brake force is related to the position of the throttle stick. Maximum brake force refers to the force when the throttle stick is located at the end point of the backward zone. A very large brake force can shorten the brake time, but it may damage the gears. The “Disable” option of S8 ESC inhibits the inherent brake function of the speed controller. When this option is selected, the brake function is realized by a traditional disc-brake system driven by a servo.

3. Program The ESC With SET Button

Please check the instructions on the page 3.

4. Reset All Items To Default Values

At any time when the throttle is located in neutral zone (except in the throttle calibration process or ESC program mode), hold the “SET” key for over 3 seconds, the red LED and green LED will flash at the same time , which means each programmable item has be reset to its default value.

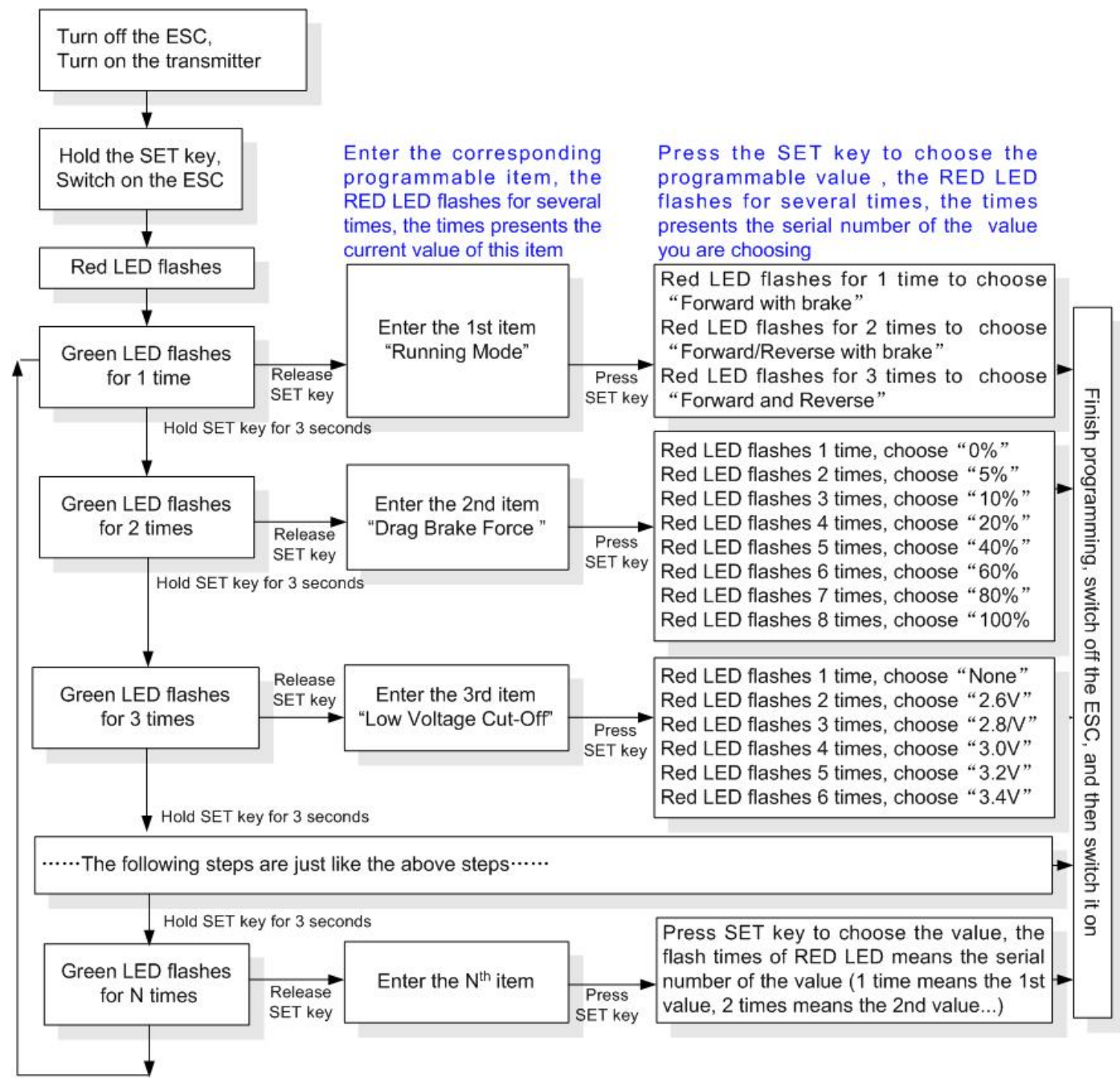
【TROUBLE SHOOTING】

Trouble	Possible Reason	Solution
After power on, motor doesn’t work, and the cooling fan doesn’t work	The connections between battery pack and ESC are not correct	Check the power connections Replace the connectors
After power on, motor can’t work, but emits “beep-beep-, beep-beep-” alert tone. (Every group of “beep-beep-” has a time interval of 1 second)	Input voltage is abnormal, too high or too low	Check the voltage of the battery pack
After power on, red LED always lights, the motor doesn’t work	Throttle signal is abnormal	Plug the control wire into the throttle channel of the receiver correctly.
The motor runs in the opposite direction when it is accelerated	The wire connections between ESC and the motor are not correct	Swap any two wire connections between the ESC and the motor.
The motor suddenly stops running	The throttle signal is lost	Check the transmitter and the receiver Check the signal wire from the throttle channel of your receiver
	The ESC has entered the Low Voltage Protection Mode or Over-heat Protection Mode	Red LED flashing means Low voltage protection. Please replace battery pack. Green LED flashing means Over-heat protection, please stop running to cool the ESC.
When accelerating quickly, the motor stops or trembles	1) The battery has a bad discharge performance 2) The gear rate is too small 3) The “Start Mode (Punch)” of the ESC is too aggressive	1) Use a better battery 2) Use lower KV motor or change the gear rate, choose smaller pinion 3) Select a softer option for the “Start Mode (Punch)”

【PROGRAM THE ESC WITH SET BUTTON】

The following is a flow chart sample for programming a S8 ESC.

Flow chart: Program the ESC with the SET key



Note3:

- ★ In the program process, the motor will emit “Beep” tone at the same time when the LED is flashing.
- ★ If the “N” is bigger than the number “5”, we use a long time flash and long “Beep---” tone to represent “5”, so it is easy to identify the items of the big number.
For example, if the LED flashes as the following:
“A long time flash + a short time flash” (Motor sounds “Beep---Beep”) = the No. 6 item
“A long time flash + 2 short time flash” (Motor sounds “Beep---BeepBeep”) = the No. 7 item
“A long time flash + 3 short time flash” (Motor sounds “Beep---BeepBeepBeep”) = the No. 8 item
.....
And so on.

【OPTIONAL ACCESSORIES FOR UPGRADE】

- 1. High Voltage Cooling fan (12V):** The high voltage fan is necessary when you are using 3S Lipo or more than 6 cells NiMH battery pack for S10B/C/D ESCs.
- WARNING!**
The original cooling fan (5V) combined with the S10B/C/D ESC can ONLY work with a 2S lipo battery pack or 4-6 cells NiMH battery pack. Please NEVER use it with a 3S Lipo battery pack or NiMH batteries pack more than 6 cells, otherwise it may be damaged.
The 12V cooling fan is only useful for the S10B/C/D ESCs.
- 2. Program Card for ESC:**
The Program Card is an optional accessory which needs to be purchased separately. It has friendly user interface. The process of programming the ESC becomes quite easy with this pocket sized device.
When programmable value needs to be changed, please just plug the control wires of the ESC (trio wires with black, red and white color) into the port of the program card (The port is on the right corner, and marked with ⊖ ⊕ ⊔), and then connect battery pack to the ESC. After several seconds, the value of programmable item will be shown by the digital LED.
Use “ITEM” and “VALUE” buttons to select the programmable items and new values, and then press “OK” button to save the new settings into the ESC. Press “RESET” button will change each programmable item to its default value.

