Declaration

Thanks for purchasing "SeaKing" series Electronic Speed Controller (ESC) for boat. High power system for RC model can be very dangerous, so we strongly suggest you read this manual carefully. In that we have no control over the correct use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of the product. Any claims arising from the operating, failure of malfunctioning etc. will be denied. We assume no liability for personal injury, consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation to compensation is limited to the invoice amount of the affected product.

Features

The "**SeaKing**" series brushless controllers include ESCs of 25A, 35A and 60A for boats.

1. Specially designed for RC boat, with excellent start-up, acceleration and linearity features.
2. Use top quality electronic components to enhance the current endurance ability of the ESC.
3. With water cooling system and the whole ESC is waterproof to get a longer life.
4. 2 running modes, "Forward Only" mode and "Forward/Backward" mode.
5. With brake function to make it easier to control the boat.
6. Multiple protection features: Low voltage cut-off protection for lithium or nickel battery / Over-heat protection / Throttle signal loss protection.
7. 8 steps of timing adjustment, compatible with all kinds of sensorless brushless motor.

Specifications

Model	SeaKing-25A	SeaKing-35A	SeaKing-60A
Cont. Current	25A	35A	60A
Burst Current	90A	190A	380A
Resistance	0.005 ohm	0.0015 ohm	0.0007 ohm
Battery	4-12 Cells Ni-xx (NiMH or NiCd) or 2-4 Cells Li-Po When using 9-12 cells NiMH/NiCd or 4 cells Lipo battery, you must disable the output of the built-in BEC and supply the receiver with a 3Amp UBEC. *(*Note1)*		
BEC Output	6V/1.5A		
Motor Type	Sensorless Brushless Motor		
Dimension	**31.5* 27.5* 16**		
Weight	23g(Without wires)	30g(Without wires)	32g(Without wires)

**Note1: To disable the built-in BEC, please cut the red wire in the trio of the receiver wires.*

Begin To Use The New ESC

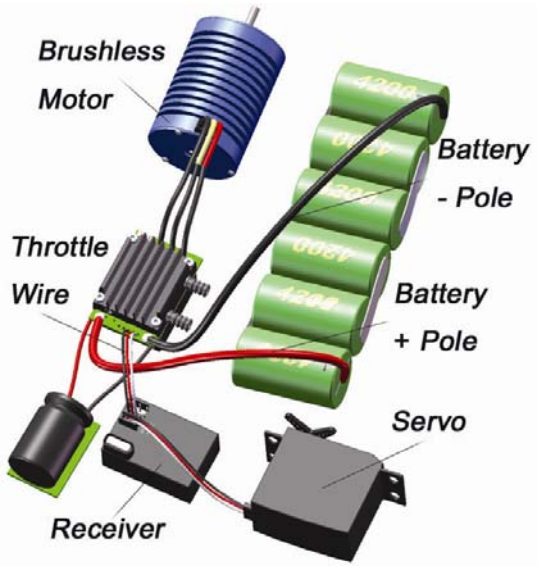
1. Connect the ESC, motor, receiver, battery and servo according to the following diagram

"+" and "-" wires on the ESC are connected with the battery pack, and #A, #B and #C are connected with the motor wires. The "SET" button is used for programming the ESC.

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.

Note: You can use the transmitter to set the throttle channel to the "Reverse" direction, and then the motor will run reversely. Please calibrate the throttle range again after changing the direction of throttle channel.



2. Throttle Range Setting (Throttle Range Calibration)

In order to make the ESC fit the throttle range, 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 top point of "forward"," backward" and the neutral point.

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

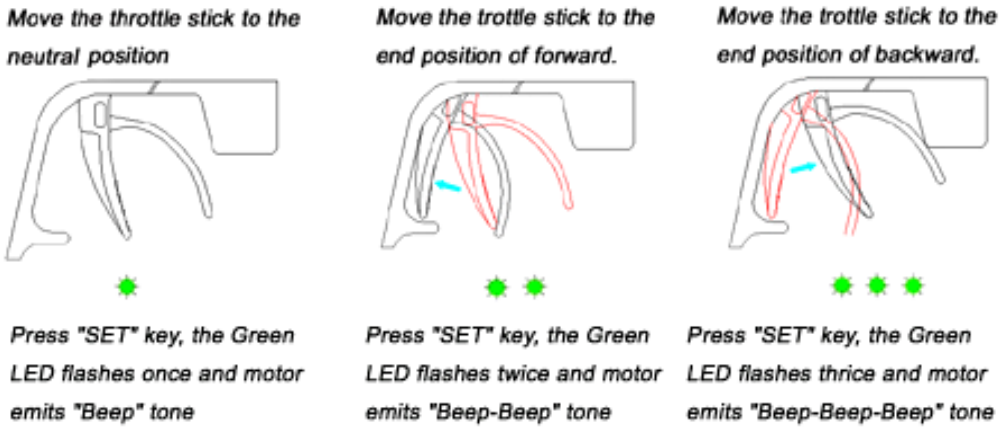
A) Turn on the transmitter, set the "EPA/ATV" value of throttle channel to "100%", and disable the "ABS" brake function of your transmitter if it does has this function.

B) Hold the "SET" key and then connect the ESC with the battery, when the red LED begins to flash, release the key immediately. (*Note2)

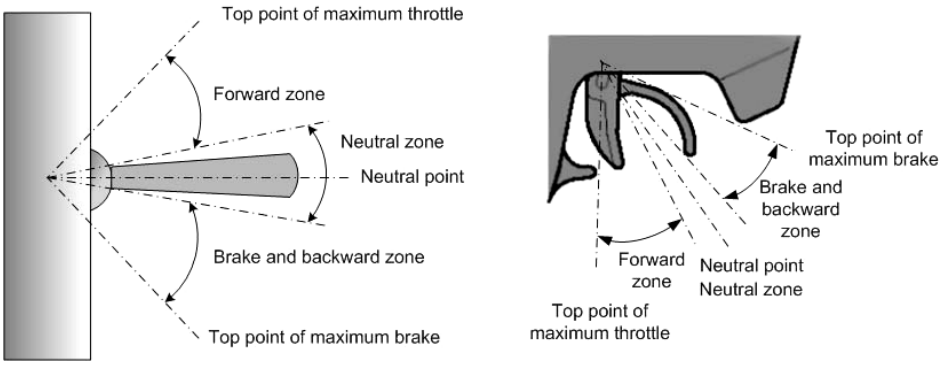
**Note2: If you don't release the "SET" key after the red LED begins to flash, the ESC will enter the program mode, in such a case, please re-calibrate the throttle range again from step A to step D.*

C) Set 3 points according to the steps shown in the picture on the right side.
1) Neutral point
2) End point of forward direction
3) End point of backward direction

D) When the process of calibration is finished, the motor can be started after 3 seconds.



If you are not using a gun-style transmitter, please refer to the picture on the right corner to set the throttle range.



3. The LED Status

In normal use, if the throttle stick is in the neutral range, neither the red LED nor the green LED lights.

a) The red LED lights when the boat is run forward or backward.
b) The green LED lights when the throttle stick is moved to the top point (end point) of the forward zone or backward zone.
c) The red LED flashed quickly when the boat is braking.
d) If the ESC is over heat, the output power will be gradually cut-off to protect the ESC, in such a case, the Green LED will flash in such a way: "Flashes-----Flashes-----Flashes-----"

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/NiCd battery packs, if the voltage of the whole NiMh/NiCd battery pack is higher than 9.0V but lower than 12V, it will be considered as a 3 cells lithium battery pack; If it is lower than 9.0V, it will be considered as a 2 cells 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 2 cells 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 special value for 5 seconds, the ESC will gradually cut off the output power.
3. Throttle signal loss protection: The ESC will cut off the output power if the throttle signal is lost for 0.2 second.

Trouble Shooting

Trouble	Possible Reason	Solution
After power on, motor can't work, no sound is emitted	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 "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, motor can't work, but emits "beep-, beep-, beep-" alert tone. (Every "beep-" has a time interval of about 2 seconds)	Throttle signal is abnormal	Check the transmitter and the receiver Check the wire of the throttle channel
The motor runs in the opposite direction	The wire connections between ESC and the motor need to be changed	Swap any two wire connections between the ESC and the motor.
The motor stops running while in working state	The throttle signal is lost	Check the transmitter and the receiver Check the wire of the throttle channel
	The ESC has entered the Low Voltage Protection Mode	Replace the battery pack
	The ESC is over heat	Restart the RC boat after a few minutes

Program The ESC

1. Programmable Items list

Programmable Items	Programmable Value							
	1	2	3	4	5	6	7	8
1. Running Mode	Forward Only	***Forward/Reverse***						
2.Low Voltage Cut-Off Threshold	Non-Protection	2.6V/Cell	***2.8V/Cell***	3.0V /Cell	3.2V /Cell	3.4V /Cell		
3.Brake	None	***Soft Brake***	Strong Brake					
4.Timing	0.00 °	3.75 °	7.50 °	11.25 °	***15.00 °***	18.75 °	22.50°	26.25°

The italics texts in the above form are the default settings.

2. Programmable Values

a) **Running Mode:** With "Forward Only" mode, the boat can go forward, but cannot go backward, this mode is suitable for competition; "Forward/Reverse" mode provides backward function, which is suitable for training.
Note: "Forward/Reverse with Brake" mode uses "Double-Click" method to make the boat go backward. When you move the throttle stick from forward zone to backward zone for the first time, 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 now. When the throttle stick is moved to the backward zone again (The 2nd "click"), if the motor speed is slowed down to zero (i.e. stopped), the backward action will be occurred. The "Double-Click" method can prevent mistakenly reverse when the brake function is frequently used in steering.
In the process of braking or reverse, if the throttle stick is moved to forward zone, the motor will regain forward running at once.

b) **Low Voltage Cut-Off:** The function is mainly to prevent the lithium battery pack from over discharging. When using lithium battery pack, please set the suitable value for low-voltage protection as your like. The ESC monitors the battery's voltage at any time, if the voltage is lower than the threshold, the output power will be cut off.

c) **Brake Function:** When this function is activated, the motor can be stopped in a shorter time.

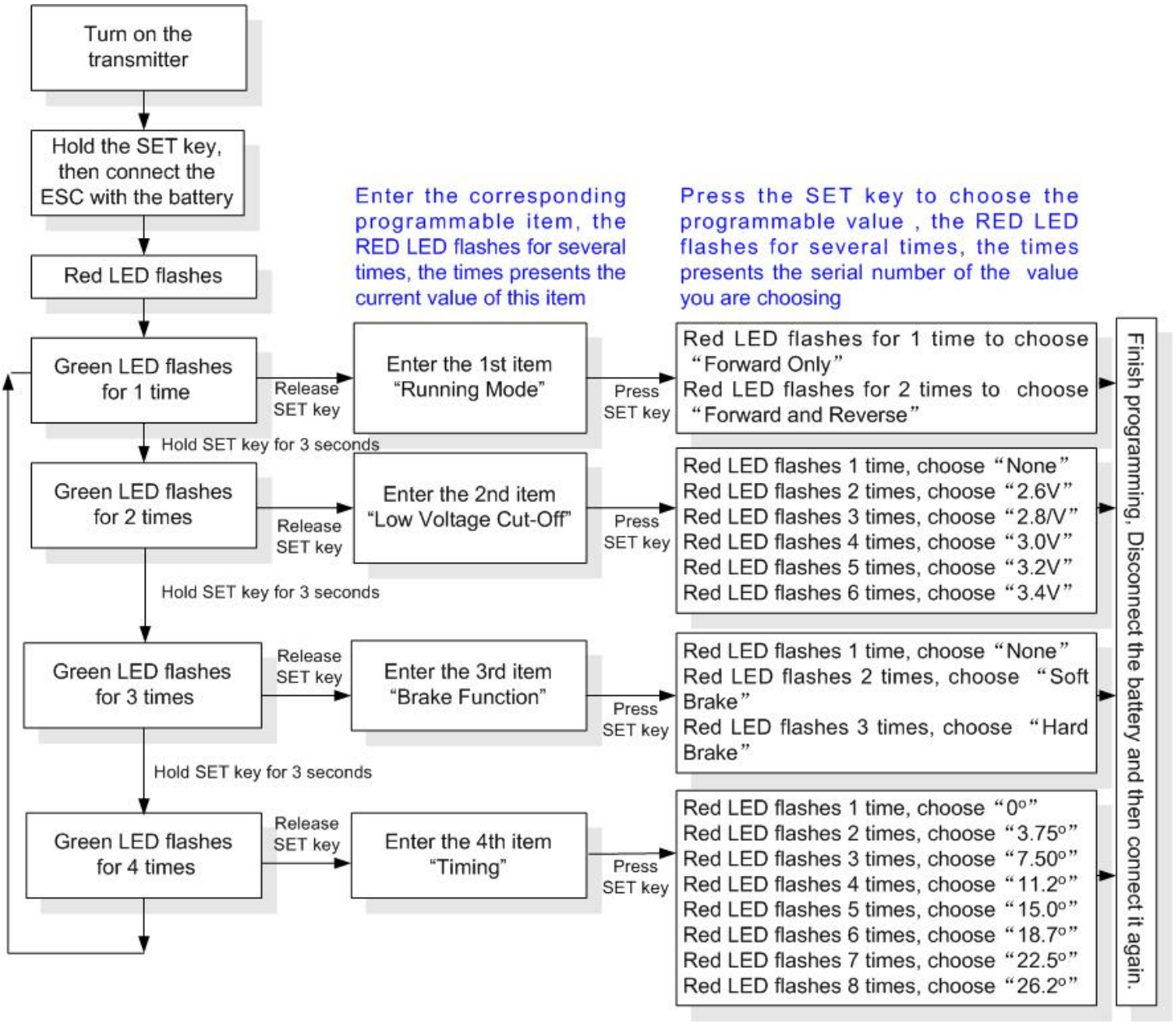
d) **Timing:** There are many differences among structures and parameters of different brushless motors, so a fixed timing ESC is difficult to compatible with all brushless motors. It is necessary to make the timing value programmable. Please select the most suitable timing value according to the motor you are just using. Generally, higher timing value brings out higher power output, but the whole efficiency of the system will be slightly lower down.

3. Reset All Items To Default Values

At any time when the throttle is located in neutral zone (except in the throttle calibration or parameters program process), hold the "SET" key for over 3 seconds, the red LED and green LED will flash at the same time, means each programmable item has be reset to its default value. **Please calibrate the throttle range again after resetting**.

4. Program The ESC

You can program the ESC with the "SET" key.



In the program process, the motor will emit "Beep" tone at the same time when the LED is flashing. In a noisy environment, perhaps you cannot hear the "Beep" tone clearly.