

Thank you for purchasing the Electronic Speed Controller (ESC) for boat. High power system for RC model can be very dangerous, so please 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】

- ▶ Specially designed for RC boat, with excellent start-up, acceleration and linearity features.
- ▶ Use top quality electronic components to enhance the current endurance ability of the ESC.
- ▶ Water cooling.
- ▶ Water-proof.
- ▶ 2 running modes: "Forward Only" mode and "Forward/Backward" mode for various of boats.
- ▶ Multiple protection features: Low voltage cut-off protection for lithium or nickel battery / Over-heat protection / Throttle signal loss protection.
- ▶ 8 steps of timing adjustment, compatible with all kinds of sensorless brushless motors.
- ▶ Compatible with the pocket-sized Program Card.

Note1: The program card is optional equipment for the boat ESC. With this program card, the setting of the ESC becomes much easier.

【Specifications】

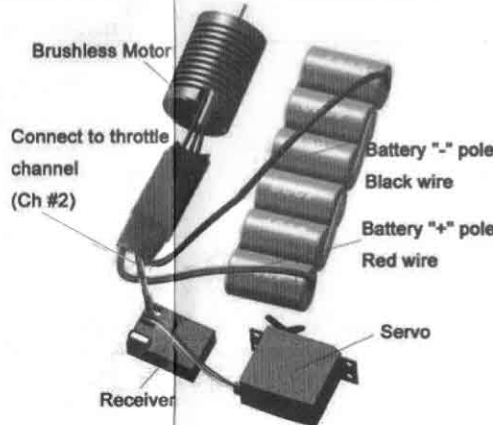
Class	Model	Cont. Current	Burst Current (10s)	BEC Mode	BEC Output	Battery Lipo	Cell NIMH	Weight	Water Cooling Pipe	Size L*W*H
40A	VEGAPOWER-40A-RTR	40A	55A	Linear	5V/3A	2-3	5-9	46g	Φ4	74*25*14.5

【Begin To Use The New ESC】

Warning! For safety, please always keep the propeller away from human body or any other object.

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

The output wires of A, B, C 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.



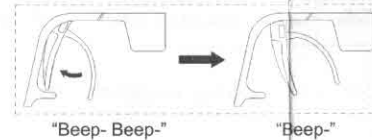
STEP #2. Throttle Range Setting (Throttle Range Calibration)

In order to make the ESC fit the throttle range, you must calibrate it for the following cases; otherwise the ESC cannot work properly.

- ▶ Begin to use a new ESC;
- ▶ Begin to use a new transmitter;
- ▶ Change the settings of neutral position, ATV or EPA etc of throttle channel.

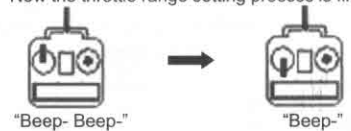
2.1 Turn on the transmitter, set the "EPA/ATV" value of throttle channel to "100%", and **disable the "ABS" brake function** of your transmitter. If you use a Futaba transmitter, please set the direction of the throttle channel to "REV".

- 2.2 If you are using a **Handgun-style** transmitter:
- a) Move the throttle stick to full throttle position, and then connect the battery pack to the ESC, after 2 seconds, motor emits "Beep- Beep-" tone, that means the full throttle position has been confirmed.
 - b) Release the throttle stick to the neutral position, motor emits a "Beep" tone, which means the neutral position has been confirmed. Now the throttle range setting process is finished.



- 2.2 If you are using a **Flat-style** transmitter:
- a) Move the throttle stick to the full throttle position, and then connect the battery pack to the ESC, after 2 seconds, motor emits "Beep- Beep-" tone, that means the full throttle position has been confirmed.
 - b) If you want to set it to **half-range**, please move the throttle stick to the neutral position, motor emits a "Beep" tone, which means the neutral position has been confirmed.

If you want to set it to **full-range** (In such a case, the boat cannot run backward), please move the throttle stick to the bottom position, motor emits a "Beep" tone, which means the bottom position has been confirmed. Now the throttle range setting process is finished.



【The Normal Start Process】

1. Move the throttle stick to the neutral position or the bottom position, and then turn on the transmitter.
2. Connect the battery pack to the ESC.
3. The motor emits several "Beep" tones to represent the cells number of your lithium battery pack. Please make sure that the number is correct. If only one "Beep" tone is emitted, that means the "Low Voltage Cutoff Threshold" is set to "No protection", this is only suitable for NiMH/NiCd battery. Please never use "No protection" mode for lithium battery; otherwise the lithium battery is damaged quickly. (Please refer to the "Programmable Items" in the following table).
4. Move the throttle stick upwards, the motor begins to run.

【Programmable Items】 Note2: The *italics texts* in the following form are the default settings.

Programmable Items	Option							
	1	2	3	4	5	6	7	8
1. Running Mode	Forward Only	<i>Forward and Backward</i>						
2. Lipo Cells	<i>Auto Calculate</i>	2 cells	3 cells	4 cells	5 cells	6 cells		
3. Low Voltage Cutoff Threshold	No Protection	2.8V/Cell	3.0V/Cell	<i>3.2V/Cell</i>	3.4V/Cell			
4. Timing	0.00 °	3.75 °	7.50 °	11.25 °	<i>15.00 °</i>	18.75 °	22.50 °	26.25 °

1. **Running Mode:** With "Forward Only" mode, the boat can go forward, but cannot go backward; "Forward and Backward" mode provides backward function, which is suitable for some specially designed boats. Please read the user manual of your boat to confirm whether it is possible to run backward.
2. **Lipo Cells:** **We strongly suggest setting the "Lipo Cells" item manually.** If you choose "Auto Calculate", the ESC will measure the battery's voltage when it is just connected, and then the ESC judges the cells number. For example, if the battery's voltage is lower than 8.8V, it will be judged as 2 cells Lipo battery. In order to let the ESC judge the cells number correctly, please always use a fully charged battery to connect the ESC. If the battery is partly discharged, the "Auto Calculate" may get a wrong result. **Note:** In the startup process, the motor will emit several "Beep" tones to represent the Lipo cells number, it is helpful for you to check whether it is coincident with the actual battery pack or not.
3. **Low Voltage Cutoff Threshold:** This 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 to 50%. Please replace the battery pack as soon as possible. **Warning!** If you keep running the motor when low voltage cutoff happens, the battery pack will be damaged!

a) **How to calculate the cutoff threshold of a battery pack:**
 The cutoff threshold of a battery pack = The threshold of each cell * cells number
 For example, if the threshold of each cell is set to "3.2V/Cell", and the battery pack is 3S (3 Cells), then the cutoff threshold of this battery pack is 3.2*3=9.6V.

b) **If you are using NiMH or NiCd battery:**
 NiMH and NiCd battery are not easy to be damaged, usually you needn't worry about the over-discharge problem, so you can set this programmable item to "No Protection".

4. **Timing:** Please select the suitable timing option according to the motor you are just using. The correct timing makes the motor running smoothly. And generally, the higher the timing is, the larger the output power is.

【Program the ESC】

1. **Program the ESC with you transmitter**

4 Steps: Enter program mode → Select programmable item → Select the new option of the selected item → Exit

STEP #1. Enter the program mode

- Switch on the transmitter, move the throttle stick to full throttle position, and then connect the battery pack to the ESC.
- Wait for 2 seconds, the motor emits "Beep-Beep"-tone.
- Wait for 5 seconds, the motor emits "♪isis" special tone, that means the program mode is entered.

STEP #2. Select the programmable item

You will hear 4 groups of "Beep" tone circularly, If you move the throttle stick to bottom position or the neutral position within 3 seconds after one kind of tones, this item will be selected.

- | | | |
|---|-----------------------|------------------------------|
| 2 | "Beep-" | Running Mode |
| 3 | "Beep-Beep-" | Lipo Cells |
| 4 | "Beep-Beep-Beep-" | Low Voltage Cutoff Threshold |
| 5 | "Beep-Beep-Beep-Beep" | Timing |

STEP #3. Select the new option for the selected item

After entering an item, you will hear several tones in loop. Set the option matching to a tone by moving the throttle stick to the full throttle position when you hear the tone, then a special tone "♪isis" emits, means the option is selected and saved in the ESC. (Keep the throttle stick at the full throttle position, you will go back to step #2 to select other items; Or move the stick to bottom or neutral position within 2 seconds to exit program mode directly.)

Tone	"B" 1 short Beep	"BB" 2 short Beeps	"BBB" 3 short Beeps	"BBBB" 4 short Beeps	"Beep-" 1 long Beep	"Beep-B" 1 long 1 short	"Beep-BB" 1 long 2 short	"Beep-BBB" 1 long 3 short
Running Mode	Forward Only	Forward & Backward						
Lipo Cells	Auto Calculate	2 Cells	3 Cells	4 Cells	5 Cells	6 Cells		
Low Voltage Cutoff Threshold	No Protection	2.8V/Cell	3.0V/Cell	3.2V/Cell	3.4V/Cell			
Timing	0°	3.75°	7.5°	11.25°	15°	18.75°	22.5°	26.25°

Note6: One long "Beep-" = 5 short "Beep". For example, "Beep-Beep" tone means the No.6 value. (5+1=6)

STEP #4. Exit program mode

There are 2 methods to exit the program mode:

- In Step #3, after selecting the new option, the motor will emits special tone "♪isis", move the throttle stick to the bottom position or the neutral position in 2 second to exit the program mode.
- Disconnect the battery pack from the ESC to exit the program mode forcibly.

2. **Program the ESC with the LED Program Card**

The LED Program Card is optional equipment for boat ESC. It has 3 digital LEDs to show the programmable items and their optional values, so its user interface is very friendly for programming the boat ESC easily. Please read the user manual of the program card for detail information.

【Trouble Shooting】

Trouble	Possible Reason	Action
After power on, motor does not work, no sound is emitted	The connection between battery pack and ESC is not correct	Check the power connection. Replace the connector.
After power on, motor does not work, such an alert tone is emitted: "beep-beep-, beep-beep-" (Every "beep-beep-" has a time interval of about 1 second)	Input voltage is abnormal, too high or too low.	Check the voltage of battery pack
After power on, motor does not work, such an alert tone is emitted: "beep-, beep-, beep-" (Every "beep-" has a time interval of about 2 seconds)	Throttle signal is irregular	Check the receiver and transmitter
The motor runs in the opposite direction	The connection between ESC and the motor need to be changed.	Swap any two wire connections between ESC and motor
The boat cannot run backward	The ESC is not set to "Forward and Backward" running mode	Program the ESC correctly
	The ESC cannot recognize the neutral point of throttle channel	Calibrate the throttle range again according to the instructions on page 1
After power on, motor does not work, a special tone "♪isis" is emitted after 2 beep tone ("Beep-Beep-")	Direction of the throttle channel is reversed, so the ESC has entered the program mode	Set the direction of throttle channel correctly
The motor suddenly speeds down even if at the full throttle situation	The ESC has entered the low voltage cutoff protection mode	Replace the battery pack as soon as possible
	The ESC is over heat	Stop running the boat for several minutes to cool the ESC