User Manual of "Sailfish" series Brushless Speed Controller for Boat

Thanks for purchasing "SAILFISH" series 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. 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

1. 2 running modes, "Forward Only" mode and "Forward/Backward" mode for various of boats.
2. 5 steps of timing adjustment, compatible with all kinds of sensorless brushless motor.
3. Multiple protection features: Low voltage cut-off protection for lithium or nickel battery/Over-heat protection/Throttle signal loss protection.
4. Pocket-sized Program Card can be purchased separately for easily setting the programmable items and online update.

Note 1: The program card is optional equipment for the ESC.

Programmable Items Note 2: The italics texts in the following form are the default settings:

Programmable Items	Value					
	1	2	3	4	5	6
1.Running Mode	Forward Only	Forward&Backward				
2. Timing	Very Low	Low	Mid	High	Very High	
3. Start up Accelerate	Very Soft	Soft	Acce			
4. Low Voltage Cutoff	2.6V/C	2.8V/C	3.0V/C	3.2V/C	3.4V/C	No Protection
5. Motor Div	Forward	Reverse				
6. Frequency	Low	High				

1. Running Mode: **Forward Only**/Forward and Backward
2. Timing：Very Low/Low/**Middle**/High/Very High

Please select the most suitable timing value according to the motor you are just using. The correct timing value makes the motor running smoothly. And generally, higher timing value brings out higher output power and higher speed but more heat.

3. Start up Acceleration: Very Soft/**Soft**/Accelerate
4. Low Voltage Cutoff Threshold：2.6V/2.8V/**3.0V**/3.2/3.4/No protection
   1) If you are using Lipo battery pack，the ESC will automatically calculate the No. of Battery cells.For example, if you are using a 3 cell Lipo pack and set the cutoff voltage as 3.0V/cell, then the cutoff value will be: 3.0*3=9.0V。
   2) If you are using NiMH or NiCd battery, they 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".
5. Motor Rotation：**Forward**/Reverse

In most cases motor rotation is usually reversed by swapping two motor wires. However, in cases where the motor cables have been directly soldered the ESC cables, motor rotation can be reversed by changing the value of setting on the ESC.

6> **6.** Frequency Type: **Low**/High

For motors have more polarities and high RPM, if you are using High frequency, the motor will run more smoothly and faster, but will cause more heat and switching to ESC.

[Begin to use The New ESC]

Step 1, Connect the ESC, motor, receiver, battery and servo accordingly.

Step 2, Throttle Range Setting (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 of the throttle stick, ATV or EPA parameters etc.

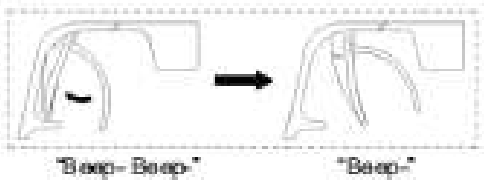
2.1 Turn on the transmitter set the "EPA/AVT" value of throttle channel to "100%", and disable the "ABS" brake function of your transmitter if it does has this function. If you are using a Futaba transmitter, please set the direction of the throttle channel to "REV"

2.2 If you are using a **Handgun-style** transmitter

a) Move the throttle stick to the maximum position(i.e. full throttle position), and then connect the battery pack to the ESC, after 2 seconds, "Beep-Beep" tone can be heard, that means the full throttle position has been confirmed.

b) The "Beep-Beep" can be heard for 4 times repeatedly, during this time, release the throttle stick to the neutral position, a special "Beep-" tone can be heard, that means the neutral position has been confirmed.

Now the throttle range setting process is finished.



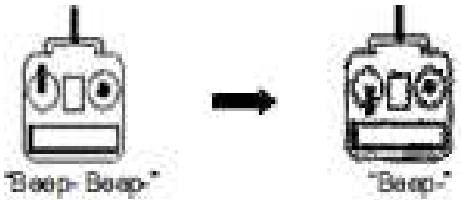
2.2 If you are using a **flat-Style** transmitter

a) Move the throttle stick to the top position (that is full throttle position), and then connect the battery pack to the ESC, after 2 seconds, "Beep-Beep-" tone can be heard, that means the ful throttle position has been confirmed.

b) If you want to set it to **half-range,** please move throttle stick to the neutral position, a "Beep" tone can be heard, that 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, a "Beep" tone can be heard, that means the position has been confirmed.

Now the throttle range setting process is finished.



[The Normal Start Process]

Move the throttle stick to the neutral position or the bottom position, and then turn on the transmitter.

Connect the battery pack to the ESC.

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" mode for lithium battery, otherwise the battery is very easy to be damaged.

Move the throttle stick upwards, the motor begins to run and speeds up.

[Program the ESC]

1. Program the ESC with your transmitter4 Steps: Enter Program mode →Select programmable item→Choose the new value of the selected item→Exit

STEP #1. Enter the program mode

1. Switch on the transmitter, move the throttle stick to maximum position(Full throttle position), and then connect the battery pack to the ESC.
2. Wait for 2 seconds, the motor emits "Beep-Beep-" tone.
3. The motor will "Beep-Beep-" tone repeatedly for 4 times, that means the program mode is entered.

STEP#2. Select the programmable item

You will hear 6 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.

1. "Beep-"	Running Mode
2. "Beep-Beep-"	Timing
3. "Beep-Beep-Beep-"	Start up Acceleration
4. "Beep-Beep-Beep-Beep-"	Low Voltage Cutoff Threshold
5. "Beep---"	Motor Diversion
6. "Beep---Beep-"	Frequency Type

STEP#3. Choose the new value for the selected item

After entering an item, you will hear several tones in a loop. Set the value matching to a tone by moving the throttle stick to the maximum position (Full throttle position) when you hear the tone, then a special tone emits, means the value is chosen and saved in the ESC. (Keep the throttle stick at the maximum position(Full throttle position), you will go back to step#2 and you can select other items; Cut off the power directly will exit program mode directly.

Programmable Items	**Value**					
	1	**2**	**3**	**4**	**5**	**6**
1.Running Mode	Forward	Forward&Backward				
2. Timing	Very Low	Low	Mid	High	VHigh	
3. Start up Acce	Very Soft	Soft	Acce			
4. Low Vol Cutof	2.6V/C	2.8V/C	3.0V/C	3.2V/C	3.4V/C	no protect
5. Motor Div	Forward	Reverse				
6. Frequency	Low	High				

STEP#4. Exit Program mode
Disconnect the battery pack from the ESC to exit the program mode forcibly.

2. Program the ESC with the Program Card

Program card is an optional equipment for boat ESC, it has 3 digital LEDs to show the programmable items and their values, so the user interface is very friendly. It is quite easy for programming the ESC with this small equipment. Please read the user manual of program card for more 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-	Input voltage is abnormal, too high or too low.	Check the voltage of battery pack.
The boat cannot run backward	The ESC is not set to “Forward and Backward” in running mode The ESC cannot recognize the neutral point of throttle channel	Program the ESC correctly Calibrate the throttle range again according to the instruction on page 1
The motor suddenly speeds down even if at the full throttle situation	The ESC has entered the low voltage cutoff protection mode The ESC is over heat	Replace the battery pack right away Stop running the boat for several minutes to cool the ESC
The motor cannot start up but jibber only	Motor wire and ESC output wire connection is incorrect ESC or motor is damaged	Check if the connection of wires are correct or not Change new ESC or Motor
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.

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