

## 01 Introduction

### USER MANUAL SEAKING

Brushless Electronic Speed Controller  
SEAKING Pro 70A G2



Thank you for purchasing this Hobbywing product. 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

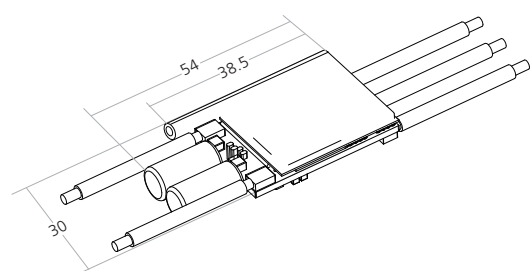
- Ensure all wires and connections are well insulated before connecting the ESC to related devices, as short circuit will damage your ESC.
- Ensure all devices are well connected, in order to prevent poor connections that may cause your boat to lose control or other unpredictable issues like damage to the device.
- Please use a soldering iron with the power of at least 60W to solder all input/output wires and connectors.
- Stop using the ESC when its heat-sink temperature exceeds 90°C/194°F; otherwise your ESC and/or motor will get damaged. We recommend setting the "ESC Thermal Protection" to 105°C/221°F (this refers to the internal temperature of the ESC).
- Never attempt to drive two brushless motors with only one ESC, otherwise the ESC will fail.
- Please keep the propeller away from your body and other objects.

## 03 Features

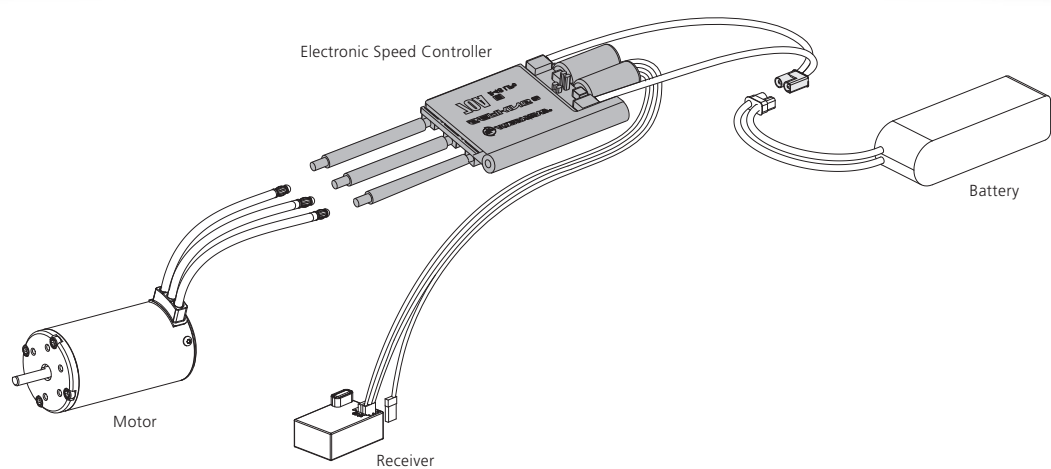
- Light-weight and small size, suitable for mini boat competition.
- Built in powerful switch mode BEC, continuous current up to 5A, peak up to 10A, and supports 6V/7.4V/8.4V adjustable, easily driving various powerful servos and high-voltage servos.
- The innovative Turbo Acceleration function allows the motor to release stronger power instantly.
- The PWM frequency is adjustable to meet the precise adjustment of the throttle output.
- Data recording function: Supports recording of extreme value data, and also supports using OTA Bluetooth module to record and view real-time running data.
- Support the use of LED Program Box, LCD Program Box Pro/G2, and OTA Programmer for parameter setting.
- Firmware upgrade via HOBBYWING LCD Program Box Pro/G2 or OTA programmer (sold separately).

## 04 Specifications

Model	Cont. AMP	Peak AMP	BEC Output	LiPo Cells	Weight	Diameter of Water Cooling port (mm)	Size(Without water cooling port & capacitor)	Main Application
SEAKING Pro 70A G2	70A	200A	6V/7.4V/8.4V Adjustable, continuous current 5A (Switch-mode)	2-4S LiPo	35g(w/o water cooling port)	∅2.0/4.0mm	38.5(L) x 30(W) x 8.4(H)mm	Mini Mono, Mini ECO, Mini Hydro



## 05 Connections



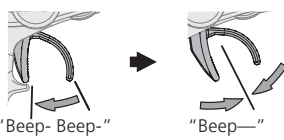
- 1. Motor connection:**  
There are no wire sequencing requirements for the connection between the esc and the motor. If the motor rotates in the opposite direction, you can exchange two of the motor wires, or set the "Motor Rotation" parameter to change the motor direction.
- 2. Connect the water-cooling pipe:**  
The water cooling port is not installed on the esc in the factory state and is included in the packaging box, it can be installed according to your needs, it can be tightened on the threaded hole of the heat sink if you want, and then connect the water cooling pipe.
- 3. Receiver connection:**  
Insert the throttle cable of the ESC into the throttle channel of receiver. The red wire of throttle cable provides the BEC voltage to receiver and steering servo, do not supply power to receiver, otherwise the ESC may be damaged. If need to supply power, unpin/disconnect the red wire with the throttle cable, insulate it and secure it away.  
**Yellow signal cable**  
This is an auxiliary(AUX) cable, it is used to connect to the idle/AUX channel on the receiver, and you can use the channel switch/knob specified by the transmitter to activate the turbo timing in real time. Please refer to the explanation of parameter item 13.
- 4. Battery connection:**  
Make sure that the (+) pole of the ESC is connected to the (+) pole of the battery and (-) to the (-), **the red wire is the positive pole, and the black wire is the negative pole. If the connection is reversed, the ESC will be damaged and will not be covered by the warranty.**

## 06 ESC Setup

### 1 Set the Throttle Range - ESC Calibration Process

The calibration must be done on the first use of the ESC, or if a new radio or receiver is installed, otherwise the esc may not work correctly. We strongly recommend to open the fail safe function of the transmitter, set the no signal protection of throttle channel ("F/S") to close the output or set the protection value to the throttle neutral position, thus the motor can stop running if the receiver cannot receive the signal of the transmitter. The calibration steps are below.

1. Turn on the transmitter, ensure all parameters (D/R, EPA, ATL) on the throttle channel are at default (100%). For transmitter without LCD, please turn the knob to the maximum, and the throttle "TRIM" to 0 (If the transmitter without LCD, turn the knob to the middle point). **This step can be skipped if the radio's settings are default!**
2. If you are using a pistol transmitter:  
Pull the throttle trigger to the full throttle position and hold it, then connect the esc to the battery, 2 seconds later, the motor will emit two beeps, indicating that the full throttle position has been confirmed, and then release the trigger to the neutral position, the motor will emit a long beep, indicating that the calibration has been completed.
3. If you are using a stick transmitter:  
Push the throttle trigger to the full throttle position, then connect the esc to the battery, 2 seconds later, the motor will emit two beeps, indicating that the full throttle position has been confirmed. If you want to set it to half throttle travel, place the throttle trigger to the neutral position; if you want to set it to whole throttle travel, pull the throttle trigger to the lowest/bottom position (In such a case, the boat cannot run backward); the motor will emit a long beep, indicating that the calibration has been completed.



Note: When the motor emits "Beep" tone(s), the red LED in the ESC flashes at the same time.



### 2 Start-up

- Move the throttle trigger/stick to the zero throttle position, and then turn on the transmitter.
1. Connect a battery pack to the ESC; the motor will beep "Number" times to indicate the amount of Lipo cells you have plugged in. Please ensure the cell count is correct.
  2. 1 second later, the motor will beep a long beep "B—" to indicate the ESC is ready to run. If the throttle trigger/stick is not at the zero throttle position, the motor will keep beeping a quick beep "B,B,B..." until the throttle trigger/stick is moved to the zero throttle position.
  3. You can start the motor.

### 3 Programmable Items

The highlighted options are the default settings of the ESC.

Programmable Items	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Running Mode	Forward Only	Forward and Reverse							
2. Max. Reverse Force	25%	50%	75%	100%					
3. LiPo Cells	Auto	2S	3S	4S					
4. Cutoff Voltage	LED Box	Disabled	2.8V/Cell	2.9V/Cell	3.0V/Cell	3.1V/Cell	3.2V/Cell	3.3V/Cell	3.4V/Cell
	LCD Box/OTA	Disabled	5.0-14.8V, Step: 0.1V						
5. ESC Thermal Protection	LED Box	Disabled	105°C/221°F	125°C/257°F					
	LCD Box/OTA		7.4V	8.4V					
6. BEC Voltage		6.0-8.4V, Step: 0.1V, Default: 6.0V							
7. Motor Rotation	CCW	CW							
8. Punch	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9
9. Initial Throttle Force	2%	3%	4%	5%	6%	7%	8%	9%	10%
10. PWM Drive Frequency	6K	8K	10K	12K	14K	16K			
11. Freewheeling	Disabled	Enabled							
12. Timing	0°	3.75°	7.50°	11.25°	15.0°	18.75°	22.5°	26.25°	30.0°
13. Turbo Timing	0°	3.75°	7.50°	11.25°	15.0°	18.75°	22.5°	26.25°	30.0°
14. Turbo Increase Rate	5°/0.1s	10°/0.1s	15°/0.1s	20°/0.1s	25°/0.1s	30°/0.1s	Instant		

#### 1. Running Mode

##### Option 1: Forward Only

The boat can only go forward in this mode. This mode is usually for racing.

##### Option 2: Forward and Reverse

The boat can also go backward in this mode. This mode is applicable to most applications. (Note: Please ensure that the drivetrain of your boat can reverse. Because the drivetrain with flexible shaft can only go in one direction, the reversal may damage the flexible shaft.)

#### 2. Max. Reverse Force:

Refers to the reversing speed. Please make sure to confirm whether the transmission system of the boat supports when setting it. It is recommended to use a small reverse force generally.

#### 3. LiPo Cells:

Set the correct value according to the actual number of LiPo batteries used. The default is automatically calculated. If the same cells of LiPo batteries are usually used, it is recommended to set this parameter to avoid misjudging, for example, 3S Lipo without power may be incorrectly calculated as fully charged 2S Lipo.

#### 4. Cutoff Voltage:

This function is mainly to prevent excessive discharge of lithium batteries causing damage. The ESC monitors the battery voltage at all times, and once the voltage falls below the set threshold, the power output will be reduced to 50%. The RED LED will flash a short, single flash that repeats (↕, ↕, ↕) to indicate the over-heat protection is activated.

#### 5. ESC Thermal Protection:

When the temperature of the ESC reaches the set value, the power output will be reduced to 50%. The GREEN LED will flash a short, single flash that repeats (↕, ↕, ↕) to indicate the over-heat protection is activated.

#### 6. BEC Voltage:

BEC voltage support 6V/7.4V/8.4V. Generally, 6.0V is suitable for standard servos, while 7.4V/8.4V is suitable for high-voltage servos. Please set according to the servo specifications.

**WARNING!** Do not set the BEC voltage above the maximum operating voltage of the servo and receiver, as this may damage the servo/receiver or even the ESC.

#### 7. Motor Rotation:

Used to set the rotation direction of the motor. Due to differences in motors and boat structure, it is possible for the boat to reverse when the throttle is applied to forward, in this case, you can solve it by adjusting this item.

#### 8. Punch:

This item is used to control the throttle response. The higher the punch, the more aggressive the throttle will be applied. If set too high, it may cause excessive start-up current and have adverse effects on the motor/ESC/battery.

#### 9. Initial Throttle Force:

It also called as minimum throttle force. You can set it according to the actual running situation, if you feel that the initial starting force is not enough, or if there is any cogging with very light throttle input, you can try to increase the initial throttle force.

#### 10. PWM Drive Frequency:

The acceleration will be more aggressive at the initial stage when the drive frequency is low; the acceleration will be more smoother when the drive frequency is high. You can set it according to the actual test results of your boat.

#### 11. Freewheeling:

When this function is enabled, it will slow down faster when releasing the throttle, provide better throttle linearity and energy recovery, and less heat under the same conditions.

#### 12. Timing:

This is the general timing and has three functions:

- 1) Compatible with different motors, some motors may work abnormally under the default value and need to be adjusted to the appropriate timing for normal operation;
- 2) The motor speed can be fine tuned, and the higher the timing, the higher the speed (and the higher the current). Whether there will be an increase in speed is related to factors such as the motor and load, and the specific effect depends on actual testing.
- 3) Adjusting the appropriate timing can improve the efficiency of the power system.

#### 13. Turbo Timing:

It can release greater power from the motor, and this timing is activated in real-time through the AUX/idle channel of the receiver & transmitter. Connect the yellow signal cable of the ESC to a AUX/idle channel of the receiver, and use the corresponding channel switch/button to activate or deactivate it in real time. When the channel signal value is greater than 1500us, the ESC will activate the turbo timing; otherwise, it will be closed.

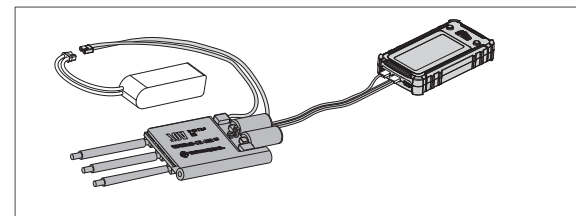
#### 14. Turbo Increase Rate:

This item is used to define the "speed" at which Turbo Timing is released when the trigger condition is met. For example, "5°/0.1s" refers to the Turbo Timing of 5 degrees that will be released in 0.1 second. Both the acceleration and heat is higher when the "Turbo increase rate" is of a larger value.

## 4 ESC Programming

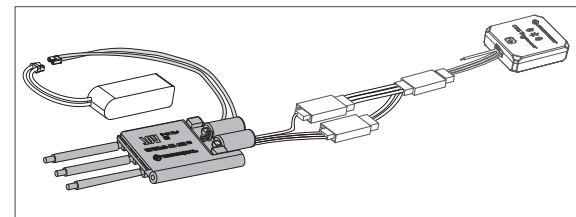
### • Using the LCD Program Box Pro/G2 or LED Program Box for parameter settings

Connect the throttle cable(white/red/black) to the interface marked with "- + -" on the LCD Program Box(red to positive, black to negative), and at the same time, connect the yellow signal cable to the interface marked with "- + a" ("ESC") on the LCD Program Box(the yellow wire corresponds to the signal interface). Finally, connect the battery to the esc.



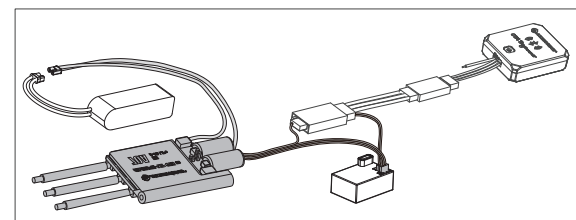
### • Using the OTA Programmer for parameter settings

Connect the ESC to the OTA Bluetooth module using the standard "Y" cable in the OTA programmer packaging box as shown in the figure below, and use your phone to install the HW LINK APP to set the esc.



### • Read the running data of esc

- 1) Click on the **【Data record】** on the homepage of the LCD Box Pro to read the four extreme values of the highest temperature of the esc, the maximum current, the lowest voltage of the battery, and the highest rpm of the motor during the operation of the esc.
- 2) By using the OTA Bluetooth module, you can view the extreme values recorded above, real-time data, and historical data (curve chart) under the **【Data Log】** menu in the HW LINK App on your phone. **Please note that when you want to record and read real-time or historical data, the ESC must always be connected to the OTA Bluetooth module during running. Use the standard "Y" wire in the packaging box of esc to make the relevant connections, as shown in the figure below.**



### • Upgrade of firmware for esc

- 1) Using the LCD Box Pro or OTA programmer, download and install the HW LINK App on your phone, click on the **【Firmware Update】** button on the APP homepage to upgrade the firmware of the esc.
- 2) Connect to the computer through the LCD Box Pro/G2, download and install Hobbywing USB LINK software on the computer, and use this software to upgrade the firmware for esc.

## 5 Factory Reset

- Restore the default values with a multifunction LCD Program Box Pro: After connecting the program box to the ESC, Click on **【Parameter Settings】** and select the **【Reset Parameters】** to restore the factory settings.
- Restore the default values with a OTA Programmer (& HW Link App) : After connecting the OTA Programmer to the ESC, open the HOBBYWING HW Link App on your smart phone, select "Parameters" followed by "Factory Reset" to reset the ESC.

## 07 Explanations for LED Status

#### • During the Start-up Process

- 1) The RED LED flashes one time per 2 seconds and the motor beeps at the same time indicating the ESC doesn't detect any throttle signal.
- 2) The RED LED flashes rapidly and the motor beeps at the same time indicating that the zero throttle signal has not been recognized.

#### • In Operation

- 1) The RED LED & GREEN LED die out when in the zero throttle position.
- 2) The RED LED turns on solid when your boat runs forward, and the GREEN LED will also come on when up to the full throttle (100%) endpoint.
- 3) The RED LED turns on solid when you reverse your boat. If the "Max.Reverse Force" is set to 100%, the GREEN LED will also come on when up to the full reverse(100%).

#### • When Some Protection is Activated

- 1) The RED LED flashes a short, single flash that repeats (↕, ↕, ↕) indicating the low-voltage cutoff protection is activated.
- 2) The GREEN LED flashes a short, single flash that repeats (↕, ↕, ↕) indicating the ESC thermal protection is activated.

## 08 Explanations for Protections

#### • Low-voltage Cutoff Protection

The ESC will not cut off the output but reduce it to 50% when the ESC detects the battery voltage goes below the preset cutoff voltage for 1 second. The RED LED will flash a single flash repeatedly every time when you release the throttle trigger to the neutral position.

#### • ESC Thermal Protection

The ESC will not cut off the output but reduce it to 50% when the ESC internal temperature goes above the preset value. The GREEN LED will flash a single flash repeatedly every time when you release the throttle trigger to the neutral position. The ESC will resume normal output after the temperature goes below 80 C(176 F).

**Note:** Temperature here means the internal temperature of the ESC.

#### • Throttle Signal Loss Protection

The ESC will cut off the output after it fails to detect any throttle signal for 0.1 second. The motor will immediately resume rotation after the signal is re-detected. We recommend activating the "Fail Save" function of the radio system and set it (F/S) to "Output Off" or set its value to the "Zero Throttle Position" to ensure the motor can be stopped when there is no signal received from the transmitter.

## 09 Trouble Shooting

Trouble(s)	Possible Causes	Solution(s)
No motor beep and no LED flash after the ESC was powered on.	No battery voltage was supplied to the ESC.	Check the battery, whether the connection between battery and esc is good, and whether the plug is soldered well.
The ESC was unable to start the motor, the motor beeped repetitive "BB, BB, BB" (The interval between each group of BB was 0.5 second)	The battery voltage was beyond the normal operating voltage range of the ESC.	Check the battery voltage.
The ESC was unable to start the motor, the motor beeped repetitive "B, B, B, B" (the interval between each "B" was 2 seconds).	1. The ESC didn't detect any throttle signal. 2. The transmitter and receiver were not well bound.	1. Check if the throttle cable is reversely plugged in or into the wrong channel on the receiver. And if the transmitter is turned on. 2. Refer to the user manual and re-bind the transmitter and receiver.
The boat is going in the reversed direction when the forward throttle is applied.	The motor rotation direction is incorrect.	Swap any two wire connections between the ESC and motor, or set the parameter item "Motor Rotation" to the opposite direction.
The boat couldn't reverse.	1. The "Running Mode" on the ESC was not set to "Forward and Reverse" option. 2. The ESC couldn't recognize the neutral position.	1. Set the "Running Mode" on the ESC to "Forward and Reverse" option. 2. Refer to the user manual and re-calibrate the throttle range.
The power was suddenly decreased during operation.	1. The ESC entered the LVC protection. 2. The ESC entered the ESC Thermal protection.	1. Change another battery immediately. 2. The ESC temperature is too high, let your ESC cool down before using it again.
The motor stuttered but couldn't start.	1. Poor connection. 2. The ESC or motor was damaged.	1. Check if all the connectors are well soldered. 2. You can change the ESC/motor for testing to confirm.
Unable to connect to the program box or OTA.	Wrong connection.	Please refer to the wiring diagram in the "ESC Programming" section for inspection.