HOBBYWING SEAKING Series Brushless Electronic Speed Controller User Manual

HOBBYWING®

SEAKING

USER MANUAL
Brushless Electronic Speed Controller
SEAKING 120A V4
SEAKING 90A V4
SEAKING 60A V4
SEAKING 30A V4
HW-SMA708DUL0020250219

Contents

Disclaimer

Thank you for purchasing this HOBBYWING product! Please read this user manual carefully before use, once you use the product, it is understood that you have read and agreed with all the content. Brushless power systems can be very dangerous and any improper use may cause personal injury and damage to the product and related devices, so please strictly follow the instruction during installation and use.

Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damages 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 have the right to modify our product design, appearance, features and usage requirements without notification. We, HOBBYWING, are only responsible for our product cost and nothing else as result of using our product. Regarding the possible semantic differences between two different versions of declaration, for users in mainland China, please take the Chinese version as standard; for users in other regions, please take the English version as standard.

Warnings

- Ensure all devices in the system are connected correctly to prevent any damage to the system.
- It is important to ensure that all wires and connectors soldered are properly secured. A good soldering station is recommended to do such a job to avoid short circuits, floating solder joints and overheating.
- Do not attempt to drive two brushless motors with a single ESC, as this may cause damage to the ESC.
- Please hold the boat in the air and ensure that the propeller can free spin and my not catch body parts or objects during setup, in order to avoid accidents.
- The battery must be disconnected after use. There is a small draw even when the system is off, and will eventually fully drain the battery. This may cause damage to the ESC, and will NOT BE COVERED UNDER WARRANTY.

Features

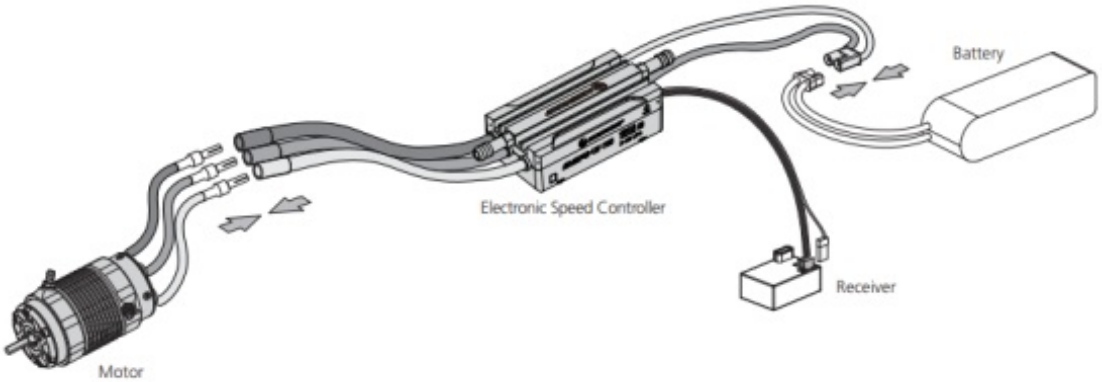
- Excellent waterproof performance(IP67).Users can use it directly without any waterproof treatment(note:if water enters after use, please blow dry each plug to prevent rusting).
- Built-in ultra-powerful switch mode BEC and adjustable voltage, supporting high torque and high voltage servos.
- Supports LED program card, LCD Program Box Pro/G2, OTA programmer (Note: optional) to set the parameters of the ESC.

- Data logging function to view various running data on the HW LINK app using the OTA Bluetooth module.
- Supports the firmware upgrade of the ESC, you can enjoy the latest functions.

Specifications

MODEL	SEAKING 120A V4	SEAKING 90A V4
Cont. / Peak Current	120A/500A	90A/360A
Lipo Cells	2-6S	2-4S
BEC Output	6V/7.4V/8.4V,8A	6V/7.4V/8.4V,8A
Size w/o water cooling pipe	64.7×36.3×22.5mm	60×36.3×22.5mm
Weight	123.5g(w / wires & output connectors)	115.6g(w / wires & output connectors)
Inner / Outer diameter of water cooling pipe	3.0/5.5mm	3.0/5.5mm
Programming Method	LED,LCD G2/PRO,OTA	LED,LCD G2/PRO,OTA
Boat Applicable	Length≤100cm	Length≤80cm
MODEL	**SEAKING 60A V4**	**SEAKING 30A V4**
Cont. / Peak Current	60A/200A	30A/100A
Lipo Cells	2-3S	2-3S
BEC Output	6V/7.4V,4A	6V/7.4V,1.5A
Size w/o water cooling pipe	38.7×29×25mm	32.8×26×18.3mm
Weight	64.6g(w / wires & output connectors)	33.9g(w / wires & output connectors)
Inner / Outer diameter of water cooling pipe	2.0/4.0mm	2.0/4.0mm
Programming Method	LED,LCD G2/PRO,OTA	LED,LCD G2/PRO,OTA
Boat Applicable	Length≤60cm	Length≤45cm

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:**

   Connect the corresponding water-cooling pipes to the esc according to the wiring of the water-cooling pipe inside the boat. It is recommended to use clamps or ties to secure the water cooling tube to prevent loosening.
3. **Recevier 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 external power to receiver, otherwise the ESC may be damaged. If need to supply external, 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 set the esc in real time, the default parameter item is “Max. Reverse Force”, and other parameter items can also be specified through item 11 “AUX CH function”.
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.

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.

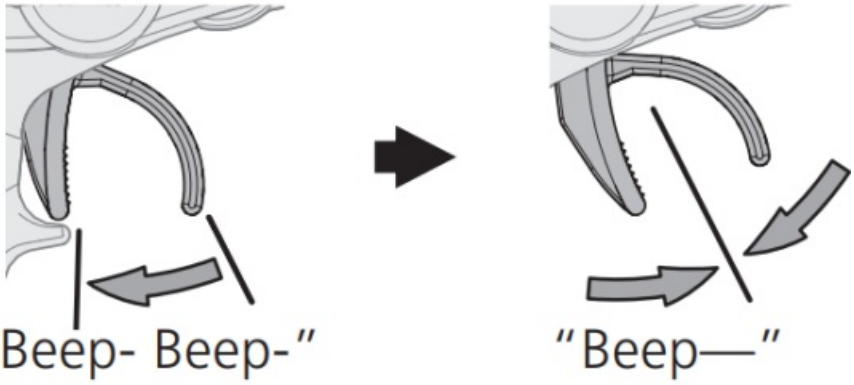
1. Turn on the transmitter, ensure all parameters (D/R, EPA, ATL)on the throttle channel are at default (100%). For transmitter without LCD, please turn the knob to the maximum, and the throttle “TRIM” to 0. (If the transmitter without LCD, turn the knob to the middle point). This step can be skipped if the radio’s settings are default!
2. If you are using a pistol-type transmitter:

   a) Pull the throttle trigger to the full throttle position, then connect the ESC to the battery pack; 2 seconds later, a row of “Beep- Beep-” can be heard, that means the full throttle position has been confirmed.

   b) Release the throttle trigger to the neutral position, a long “Beep—” can be heard, that means the neutral position has been confirmed.
3. If you are using a board-type transmitter:

   a) Push the throttle stick to the full throttle position, then connect the ESC to the battery pack; 2 seconds later,a row of “Beep- Beep-” tone can be heard, that means the full throttle position has been confirmed.

   b) If you want to set it (/the throttle range) to half-range, please move the throttle stick to the neutral position, a long “Beep—”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 pull the throttle stick to the bottom position, a long “Beep—” can be heard, that means the bottom position has been confirmed.



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

2. Power on/off and beep instructions

1. Move the throttle trigger/stick to the zero throttle position, then turn on the transmitter.
2. Connect the battery to the ESC. The motor emits several “Beeps”to report the cells number in your Lipo battery pack. Please make sure that the number is correct.
   A short “beep-“means the #1, and a long”beep—”means the #5. For example: “beep-beep-“means 2 cells. “beep—, beep-“means 6 cells.
3. One second later, the motor emits a long “beep—”to confirm the zero throttle position.
4. You can start the motor.

3. Instruction for programmable items

The highlighted options are the default settings of the ESC.

No.	Item	Option 1 l	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	45	5S	6S			
4	Cutoff Voltage	Disabled	2.6V/Cell	2.8V/Cell	3.0V/Cell	3.1V/Cell	3.2V/Cell	3.3V/Cell	3.4V/Cell	3.6V/Cell
5	BEC Voltage	6.0V	7.4V	8.4V						
6	Motor Rotation	CCW	CW							
7	Punch	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7		
8	Freewheeling	Disabled	Enabled							
9	Drag Brake Force	Disabled	10%	25%	50%	75%	100%			
10	Timing	10.0°	12.5°	15.0°	17.5°	20.0°	22.5°	25.0°	27.5°	30.0°
11	AUX CH Function	2	7	9						

Note: Regarding the “Lipo Cells” item, SEAKING 30A/60A V4 supports 2-3S adjustable,SEAKING 90A V4 supports 2-4S adjustable, SEAKING 120A V4 supports 2-6S adjustable.
Regarding the “BEC Voltage” item, SEAKING 30A/60A V4 do not have“8.4V” option.
Regarding the “Freewheeling” item, SEAKING 30A V4 does not have“Disabled” option.

1. **Running Mode:**

   Option1: Forward Only

   In this mode, only single direction operation is provided without reverse.

   Option2: Forward and Reverse

   In this mode, the motor can run in both directions.

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. **Low Voltage Cut-Off:**

   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 cut

off, and the throttle trigger needs to be returned to the neutral/zero position, then 50% of the output power can be restored, after running for 5 seconds, the power will be cut off again, such a cycle. If the battery voltage is below 3.0V/Cell, only 25% of the power can be restored. When the voltage protection is entered, the red LED flashes in the “☆, ☆, ☆”.

Note: If the discharge capacity of the battery can not meet the load of the boat, and the battery voltage is easily restored to above the set value after triggering the low voltage protection, the esc will allow the maximum 50% output power to continue running.

5. **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.

   Note: Do not set the BEC voltage above the maximum operating voltage of the servo, as this may damage the servo or even the ESC.

6. **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.

7. **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.

8. **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.

9. **Drag Brake Force:**

   Refers to the brake force generated by the motor when the throttle trigger returns to neutral position. Typically drag brake will be 0.

10. **Timing:**

    This feature 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. Adjusting the appropriate timing can improve the efficiency of the power system;
    3. 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.

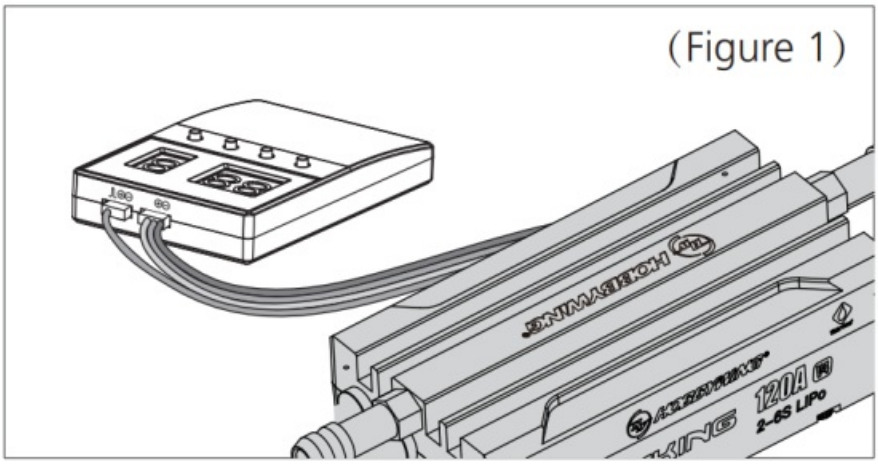
11. **AUX CH Function:**

    This parameter is used to set the real-time adjustment parameters for the idle channel of the transmitter. First,plug the yellow signal cable from the esc into a idle channel of thereceiver, and then set the parameter you want to adjust in real time for this idle channel. This way, you can use the button/knob on the transmitter corresponding to this idle channel to set this parameter in real time. For example, the default parameter is the item 2 “Max. Reverse Force”, which means you can set the reverse force by the transmitter in real time. You can set other parameters(like item 7 or 9) that you want to adjust in real time using the transmitter through the mobile app.

4. Programming method

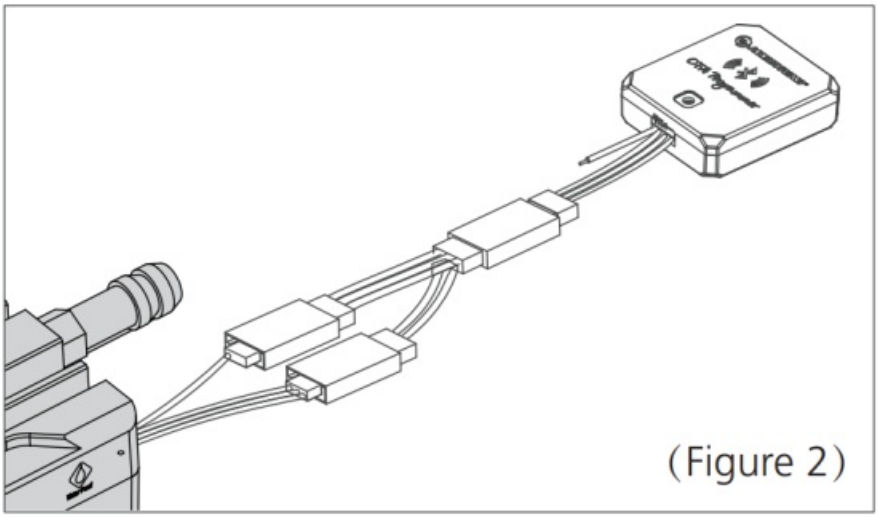
• This system supports the use of LED and LCD Program Box Pro/G2 for parameter settings. Below is an example of the setting method using the LED program box, the connection method for the LCD Program Box Pro/G2 is the same:

Connect the throttle cable(white/red/black) to the interface marked with " - + ⎍" on the LED Program Box (red to positive, black to negative), and at the same time, connect the yellow signal cable to the interface marked with " - + ⎍ " on the LED Program Box(the yellow wire corresponds to the signal interface). Finally, connect the battery to the esc. The "ITEM" and "VALUE" button on the programming card can quickly select the programming items and parameter values, press "OK" button to save the new parameters in ESC. (Refer to Figure 1)



The OTA Bluetooth module is used to set the parameters:

Connect the ESC to the OTA Bluetooth module using a "Y" cable(included in the packaging box of the OTA Programmer), and use your phone to install the HW Link APP to set the esc. (Refer to Figure 2)



Data Reading with OTA Bluetooth Module:

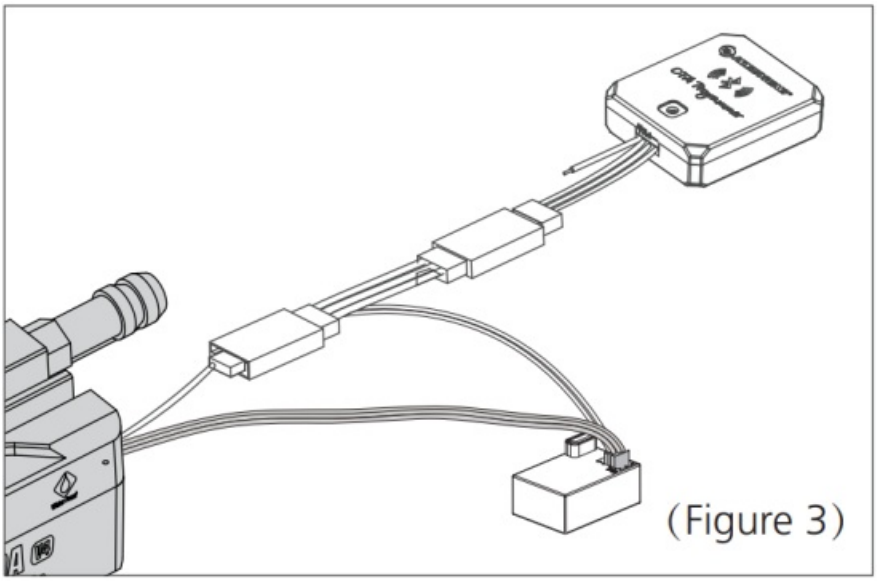
1. Accessing Peak Date

The ESC does not need to be connected to the OTA Bluetooth module during running. After runing, connect the ESC to the OTA Bluetooth module as shown in Figure 2.Open the app and select the "Data Records" option to view recorded peak data, which includes:

1) Minimum voltage
2) Maximum current
3) Maximum motor rpm
4) Maximum ESC temperature

2. Accessing Real-Time and Historical Data (Graphs)

To view real-time and historical operational data, the ESC must be connected to the OTA Bluetooth module during running. Connect the ESC's yellow signal wire to one female end of the Y cable This Y cable is included in the esc packaging box , aligning the yellow signal wire with the white signal line of the Y cable.Insert the Y cable's male end into an unused channel on the receiver, ensuring correct polarity.Connect the other female end of the Y cable to the OTA Bluetooth module (refer to Figure 3).



For the SEAKING 60A V4 ESC, due to its independent 3-pin programming interface, the method of connecting the program box or OTA programmer is different from other ESCs. The connection method is as follows.

LED Program Box&LCD Program Box Pro/G2: Connect the programming port marked with " - + ⎍ " on the ESC and the interface marked with " - + ⎍ " on the program box using a cable with JR plug at both ends, and then power on the ESC.

OTA Bluetooth module: Connect the OTA Programmer directly to the programming port marked with the " - + ⎍ " on the ESC, then power on the ESC and operate it using the HW LINK APP on your phone.

5. Factory reset

Below are several ways to recover factory parameters:

1. The LED program card: Once the LED program card is connected to the ESC, press the "RESET" key and then press "OK" to save to restore the factory settings.
2. The 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.
3. OTA Programmer: 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.

Explanation for LED status

1. The run status indication:
    1. The throttle trigger is in the zero throttle position and the LED lights are off.
    2. When advancing, the red light is constantly on, and the blue light will also come on when up to the full throttle (100%).
    3. When reversing, the red light is constantly on; If the reversing force is set to 100%, the blue light will also come on when up to the full reverse(100%).
2. What the LED means when the relevant protection function is triggered:
    1. The red light flashes (single flash, "☆, ☆, ☆"): enters the low voltage protection state. The phenomenon after triggering low voltage protection is detailed in the explanation of parameter item 4 (Low Voltage Cut-Off).
    2. The blue light flashes (single flash, "☆, ☆, ☆"): enters the esc overheat protection state. The output power will be reduced to 50% after triggering the overheat protection, and the full power output can be automatically restored after the temperature drops to a certain value.
    3. The blue light flashes (three flashes, "☆☆☆, ☆☆☆, ☆☆☆"): enters the current protection state. The esc

will cut off the output after triggering the over-current protection, and the output can be automatically restored when the throttle trigger back to the neutral/zero throttle position.

4. The blue light flashes (five flashes, "☆☆☆☆☆, ☆☆☆☆☆, ☆☆☆☆☆"): enters the capacitor overheat protection state. The output power will be reduced to 50% after triggering the capacitor overheat protection, and the full power output can be automatically restored after the temperature drops to a certain value.

Notes: The SEAKING 30A/60A V4 ESC no capacitor overheat protection.

Trouble Shooting

Troubles	Possible Causes	Solution
The light does not turn on after power-up, the motor does not start.	The battery voltage is not output to the ESC.	Check the battery,and whether the connection between battery and esc is good and whether the plug is soldered well.
The motor does not start after power-up, with a “beepbeep-, beep-beep-” warning tone accompanied by a flashing red light (approximately 0.5 seconds for each set of two-tone intervals) .	The battery pack voltage is not within the range of support.	Check the battery voltage or change the battery for testing.
After power on, the red light flashes quickly.	1. The throttle signal is not detected by the ESC; 2. The neutral point of the ESC is not calibrated correctly.	1. Check if the throttle wire is plugged into the correct channel. Check if your transmitter is turned on. Check if the receiver ok. 2. Recalibrate the throttle travel.
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 ESCand motor, or set the parameter item “Motor Rotation” to the opposite direction.
The motor suddenly stopped or significantly reduced the output in running.	1. Possible interference; 2. The ESC enters into low-voltage protection state; 3. The ESC enters into overheat protection state.	1. Check the cause of the interference in the receiver and check the battery level of the transmitter; 2. Replace the battery if red light keeps flashing; 3. The blue light continues to flash for temperature protection, please continue to use after the ESC temperature is reduced (it is recommended to reduce the load on the boat).
The motor stuttered and unable to 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.
Going forward normally, but not reverse.	1. The parameter item “Running Mode” is set incorrectly; 2. The throttle range is incorrect; 3. The ESC is damaged.	1. Set the “Running Mode” to “Forward and Reverse”; 2. Reset the throttle range(ESC Calibration); 3. Contact the distributor.
The throttle travel setting could not be completed.	The ESC did not receive the correct throttle signal.	1. Check whether the throttle cable is correctly connected to the receiver. 2. If the servo works normally,you can connect the throttle cable of esc to the steering channel to have a test, or change the transmitter/receiver system for test directly.

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Documents / Resources

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References

- User Manual