

## Introduction

Thank you for purchasing SunriseModel Sword Heli ESC 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. For the latest specification, please visit the company website: [www.vgoodrc.com](http://www.vgoodrc.com).

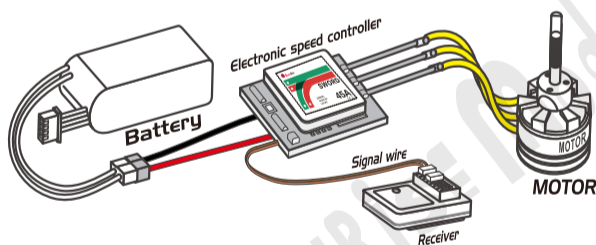
## Product features

- 32-bit ARM processor. Small size, light weight and rapid running speed.
- High resolution, smooth and responsive throttle linear. Throttle signal loss protect implemented.
- Synchronous rectification, regenerative braking, energy recuperation (saving >15% power compared with the other regular ESCs).
- Automatically detect regular input signal. Throttle travel is available for setting to compatible with different TX.
- Start up power is automatic with great acceleration.
- Adaptive timing, compatible with much more motors.
- Block protection. It will stop starting up motor when motor is blocked or can't be started for a long time to protect motor from damage.
- A programming card is designed for easy setting. Have complete independent intellectual property rights, firmware is sustainable for updates.
- Manually change rotor direction. To change the rotor rotation is never so easy.

## Parameter Spec

1. Support 2-14S (Please check ESC sticker to verify the specified cells).
2. PWM output frequency range is 8-18KHz. Different PWM can be set by programming card.
3. Regular signal throttle range is 900us-2400us.
4. Max. RPM: 300,000r/min (2 poles), 100,000r/min (6 poles), 50,000r/min (12 poles)
5. Under voltage protection. HV ESC is anti-sparked (HV only).
6. Special designed governor mode and soft start up mode for Helis.
7. Big current will activate freewheeling to reduce heating greatly.
8. Adaptive timing. Or manually set timing, 6 options available.
9. Adjustable brake by proportion, 3 options available.
10. A programming card is used for implementing different settings.

## Wire connecting



## Operation

### 1 Throttle calibration

Turn on TX, push stick to the highest position, power up ESC, the motor beeps "123" indicates power is normal, wait a second, the motor beeps twice short tones, full throttle is confirmed. Push stick down to confirm the zero throttle position. Motor beeps a long tone confirm throttle calibration is done. Then ESC read battery cells, after that, another long tone confirm the system is ready to fly. Please don't set zero throttle position too high or too low. Under no brake condition, the zero throttle position should not exceed 60% TX full throttle range. Under brake condition, the zero throttle should better set between 8-60% TX full throttle range.

### 2 Normal Start up

Connect all the devices correctly. Push stick to the lowest throttle position, turn on Tx, power up ESC, the motor beeps a long tone to confirm the ESC already received throttle signals. Then a sequence of short beeps indicates the ESC is armed to start motor now. At present, you can push the stick to start up motor directly, or you can change the rotation by finger.

Manually change rotation as follows: After ESC is armed, motor beeps a long tone, wait 1.5s, spin the motor to the correct rotation by finger in 3s. Motor beeps a short tone, wait 0.5s, then spin it again to the same rotation again in 3s. A long tone indicates the rotation is changed.

Manually changing the rotation must be done during 1.5s-5s after motor ready beep. Waiting less than 1.5s or longer than 5s is invalid.

## Features

**Please check programming card manual.**

## Safety

Due to the strong brushless power system, improper using may cause the personal injury and device damage. Please strictly follow the instructions to operate.

1 Please don't operate long time with the battery under-voltage. It will reduce the battery usage life and ESC working efficiency.

2 Please don't operate long time when the ESC is over temperature. Otherwise, it will damage the MOS FET easily.

3 Please pay attention to the motor. Don't operate continually when the motor was blocked. Otherwise, it will reduce the usage life of motor and ESC.

4 Please don't let ESC overvoltage for a long time, otherwise will short the usage life of ESC.

5 Always keep all the things away from propeller when working on a power system with the battery connected.

6 Always keep in safe when use ESC.

7 Broke or moistured ESC must not be used.

8 Only powered by battery. Power supply is not allowed.

## Attention

1. Solder clean and high quality connectors to both the ESC and motor wires, or solder the motor wires directly to the motor leads on the ESC. Swap any two connections to reverse the rotation of the motor. The motor direction can also be changed using programming card.
2. Pay attention to the polarity, wrong polarity connecting will cause ESC and motor damaged!
3. If a noise occurred during accelerating, please increase timing angle. If no work until increase timing angle to 30°, means the motor is overloaded, please change to use a smaller propeller or lower the voltage or change a better motor. If motor stop rotating and you heard twice beeps, voltage is under the set value. Please tune each battery voltage to 2.9V or 3.0V. If no working, maybe battery is over discharged or the motor wires is too thin, too long or connector is out of order.
4. Please leave some space between brake point and start up point for stick to move.
5. Timing setting range:

Inner rotor: 0-12°  
Outer rotor: 18-30°

It is better to set the timing as motor manufacturer recommend. The timing is bigger, the RPM is bigger, the power is stronger.

6. When governor mode enabled, all the heli parameters are default. The default value parameters will suitable for almost settings.

Default parameters as below:

Timing= 18°	Brake= OFF
Freewheeling= ON	I Gain= 0.9
P Gain= 0.04	Start up speed= Heli(very slow)
PWM frequency= 8Khz	Under voltage protection= Soft off

## Prompt analysis

- 1 beep / flash: the governor store mode do not finish governor speed standardization.
  - 2 beeps/flashes: Under-voltage detection
  - 5 beeps/flashes: Failure to receive signals
  - 6 short beeps/flashes: Failure to start up
- Motor will sound beeps and LED flashes when there is a improper operation occurred. The fault alarm will sound after the motor is turned off, but not stocked. When error result in shut down, disconnect battery and connect battery again. The fault alarm will be cleared after re-set.