OMPHOBBY 65A ESC Manual

Important Warnings

- Always place safety as priority when you use the product.
- An electric motor that is connection with battery pack and ESC may start unexpectedly and cause serious danger. Always treat a powered system with respect.
- Always remove the propeller or disengage the pinion gear before the battery connected if you need to working on a plane or helicopter at short range.
- Please observe all local laws regarding the flying of remote control aircraft.
- Never fly over or near crowds.

Key Features:

1.Adopting high performance 32 bit microprocessor with a running frequency of 170MHz, supported much stronger computing ability and faster running speed.

2.Adopting new generation craft on the MOSFET, low heat generation, large instantly withstand current, and high reliability.

3.Self-check function: after the ESC powered on, it will automatically check if have the power short circuit ,motor lose phase, throttle is not at zero position problem, and voltage range.

4.The special ESC case design and the unique fan guard structure greatly enhance the ESC heat dissipation performance.

5. There are two flight modes: fixed-wing mode and helicopter mode.

6. Equipped with the helicopter speed-control function, the speed sensitivity is adjustable and easy to operate.

7. The ESC has a separate programming interface to connect with LCD programming card or Bluetooth module for programming（dealer maintenance purpose).

8. Supporting data returning function: current, voltage, temperature, RPM, throttle and ESC status code.

9.Multiple protections: abnormal power-on voltage protection, start up protection, temperature protection,throttle signal loss protection, over load protection,low voltage protection, over current protection
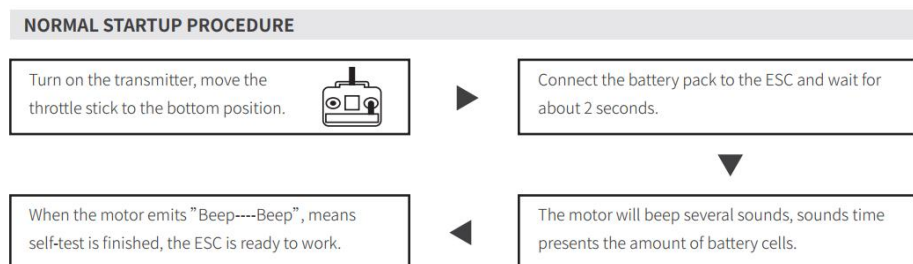
Specification

Mode	65A
Continuous/Peak current	65A/100A
Input voltage	3-6S Lipo
BEC	6V/7.4V/8.4V, 10A
Input/output wire	1xBlack&1xRed 10AWG Silicon wire / 3xBlack 10AWG Silicon wire
Size/Weight	60x36x18.5mm / 65g

Wires Connection:

1.BEC output wire(Black,Red): Plug into the receiver battery dedicated channel or any available channel.

2.RPM signal wire (Yellow):Plug into the speed input channel.

3.Throttle signal wire (Black,Red,White): Plug into the receiver throttle channel, the white wire is transmitter the throttle signal, the red wire and black wire is the BEC voltage output wire and ground wire.

The program in hard code, the 50% throttle will be 2000RPM, Max 4000 RPM, the RPM control by the throttle percentage. Governor will start at 30% of the RPM setting.

Normal startup procedure

NORMAL STARTUP PROCEDURE

Turn on the transmitter, move the throttle stick to the bottom position.	▶	Connect the battery pack to the ESC and wait for about 2 seconds.
		▼
When the motor emits "Beep----Beep", means self-test is finished, the ESC is ready to work.	◀	The motor will beep several sounds, sounds time presents the amount of battery cells.

Parameter setting and the way to check the ESC real time data

The ESC parameters can be programmed to meet different flight needs.（**parameter LCD Card purchase separately**)

Operating steps

1. Connect the ESC to LCD program card and battery correctly base on above wire connection diagram.

(the LCD program card connecting wire:Red wire corresponds to the "+" and Black wire correspond to the "-" position, pay attention to the "+" "-" lettering on the LCD and ESC)

2. After connected well, LCD program card turns on and will go to the real time data interface first.

(Real time data includes: voltage/current/throttle/RPM/temperature and so on)

3. Then press "ITEM" or "OK" button, it goes to the parameters setting interface.

(In parameters setting interface, press"ITEM" to change the programmable items, press" △" or" ▽ button to choose the item parameters you want to set, and press "OK" to save settings.)

4. After set the new ESC parameters, need to re-power the ESC again, then the new set parameters will take effect.

Programmable parameters items and instructions:

1.Programmable parameter items and corresponds programmable set values(need to final confirm)

1 Brake Type	*Normal, Reverse
2 Brake Force	*OFF, 1-10
3 Timing	*Auto, 5° 10° 15° 20° 25° 30°
4 Motor Rotation	*CW, CCW
5 SR Function	ON, *OFF
6 Battery Cells	*Auto, 3S, 4S, 6S, 8S
7 Low Voltage Cutoff Threshold	OFF, 2.3V, 2.5V, 3.0V, *3.2V, 3.4V, 3.6V
8 Low Voltage Cutoff Type	*Reduce Power, Cutoff Power
9 BEC	6.0V, 7.4V, *8.4V
10 Acceleration	0, 1, 2, 3
11 Start-up Power	Low, *Middle, High
12 Flight Mode	Fixed Wing, *Helicopter StoGov
15 Governor Parameter P	0-9 *4
16 Governor Parameter I	0-9 *4
17 Telemetry	*1 Real Time Data 2 SBUS

The options marked with " * " are the factory default setting

1. Programmable parameter project description：

1 Brake Type:

1.1 Normal Brake：When "Normal Brake" is turned on, after the throttle trigger return to zero position, it will make the motor stop running according to the parameter of brake force set, <u>default setting is Normal brake</u>.

1.2 Reverse Brake：

Plug the 3Pin signal wire into the throttle channel, and plug the 1Pin signal wire into any 2-stage switch channel of the receiver, then turn on the transmitter 2-stage switch. The Reverse Brake function is turned on now, you can change the forward and reverse directions of the motor by flipping the 2-stage switch of the transmitter.

Warning: This function can only be effective when the throttle is below 50%, and it is only allowed to be used.

2 Brake Force:

After throttle trigger is pulled to zero position, the higher value means the stronger brake force, and it will take shorter time to make the motor from running to standstill.

1-10 adjustable, 1 as 1 step, <u>default setting is 0</u>, This function only valid under normal brake mode.

3 Timing:

Adjust the angle of the motor electrically, 5°/10°/15°/20°/25°/30° adjustable, <u>default setting is Auto</u>.

4 Motor Rotation:

Clockwise and counter-clockwise direction is adjustable from the ESC, <u>default setting is CW</u>.

5 SR Function:

The synchronous rectification function makes the ESC with higher driving efficiency and more energy-saving, and support longer flight time, <u>default setting is on</u>.

6 Battery Cells:

The number of battery cells can be set by calculated automatically and set manually. If select Auto-calculation (calculated base on **3.8V** each cell). If battery cells errors occurs with motor beeps, like used LiFe or LiHV batteries, then you can set manually, <u>default setting is auto</u>.

7 Low Voltage Cutoff Threshold:

2.3V/2.5V/3.0V/3.2V/3.4V/3.6V adjustable, the voltage means each cell voltage. For example if you used 6 cells Lipo battery, then the low voltage threshold value is 6x set voltage value, <u>default setting is 3.2V</u>.

8 Low Voltage Cutoff Type:

Reduce Power:When the voltage drops to the set low-voltage protection threshold, the ESC will reduce power to 70%.

Cutoff Power:When the voltage drops to the set low-voltage protection threshold, the ESC will cut off the power immediately.

<u>Default setting is reduce power</u>.

9 BEC:

The ESC is built in BEC with 6.0V/7.4V/8.4V adjustable, <u>default setting is 8.4V</u>.

10 Acceleration

0,1,2,3, <u>default setting is 0</u>.

11 Start Up Power:

1/2/3 adjustable, set high means stronger start up force, <u>default setting is 2</u>.

12 Flight Mode:

Fixed-wing mode:suitable for fixed-wing and multi-rotary aircraft, in this mode, the throttle has to be more than 5%(include 5%) to start the motor and the throttle responds is rapid.

Helicopter mode(Heli StoGov):suitable for fixed speed flight helicopter, the throttle in this mode has to be more than 30%(include 30%) before starting the motor, the motor starts in a ultra smooth manner, after the completion of slow start speed into the fixed speed operating state, <u>default setting is helicopter mode</u>.

13 Governor Parameter P:

Control the degree of rotation while maintaining at fixed speed. The higher the value, the greater the degree of regression target speed when the speed is insufficient. Whereas, when the speed is too high, the function needs to be combined with the fixed speed sensitivity I setting. 0 to 9 adjustable, <u>default setting is 4</u>.

14 Governor Parameter I:

When the speed fails below, or exceeds the value set, the speed is compensated by the ESC. This parameter is used to resize the degree of rotation. Too large parameters will cause excessive make-up, too small parameters will cause insufficient replacement.0 to 9 adjustable, default setting is 4.

15Telemetry

Currently only FUTABA remote control (S.Bus 2 communication protocol) support Telemetry function.

Let's take FUTABA remote control as a example, to show you how to set the (Telemetry)real time data return function.

1) Connected the ESC with battery and receiver well, then turn on the transmitter, press the "Linkage" Menu like the following picture;
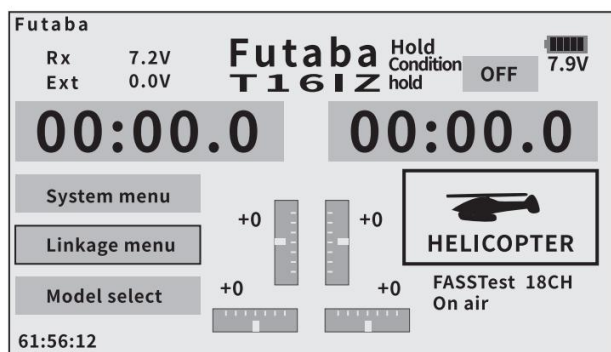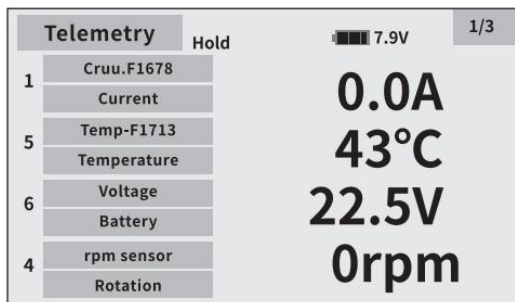

2) Select and press "Sensor" like the following picture;

3)After entered the sensor interface, select each data item in sequence like the following picture;

4)After existing from the sensor interface then enter the Telemetry interface, add the selected data item like the following picture, then you can have the real time data on the transmitter.

Telemetry	Hold	▮▮▮ 7.9V
1	Cruu.F1678	
	Current	**0.0A**
5	Temp-F1713	
	Temperature	**43°C**
6	Voltage	
	Battery	**22.5V**
4	rpm sensor	
	Rotation	**0rpm**

Protection Function:

1.Abnormal power-on voltage protection: The ESC enters a protective state once the input voltage detected is not in the operating voltage, Prompting LED light to flash.

2. Start-up protection: If the motor fails to start normally within 2 seconds after pushing the throttle to start, the ESC will cut off the output power, and you need to make the throttle calibration again, then ESC can be restarted. Possible reasons: disconnection or poor connection between ESC and motor, the propeller or motor is blocked by other objects, the gearbox is damaged, etc.

3. Over-heat protection: When the temperature of the ESC is over about 110℃, the ESC will automatically reduce the output power for protection, but will not fully shut down the power, reduce it to 70% of the full power at most to ensure the motor has enough power to avoid crashes.

4.Throttle signal loss protection: The ESC will reduce the output power if throttle signal is lost for 1 second, will cut off output to the motor if the throttle signal is lost over 2 seconds. If the throttle signal restored during power down, the ESC will immediately restored throttle control. In this way, the ESC will not protect when the signal loss less than 2 seconds, only when the signal lost is over 2 seconds or longer time. And the ESC will reduce the output power gradually instead of cutting off it immediately, so the player has enough of time to save the plane, taking into account safety and practicality.

5.Over load protection: The ESC will cut off power or restart automatically when the load increased a lot suddenly, possible reason is the motor blocked.

6.Low voltage protection: When the operating voltage of the ESC have exceeded the protection voltage set, power will be gradually reduced for safety, but will not be turned off, These will still be up to 50% of power, to ensure that the motor has the power to land.

7.Over-current protection: When the peak current exceeds the specified value, the ESC will immediately cut off the output power, and then restart to restore the power. If the current exceeds the specified value again, the output power will be completely cut off. Possible reason is overload, burnt motor and so on.