XC-ESC

C6

User Manual

Brushless Electronic Speed Controller

www.xc-bldc.com

Disclaimer

First of all thank you very much for using this product!
This product has high power and incorrect use may cause equipment damage or personal injury. Please read this statement carefully before using this product. Once this product is used, it means that you agree to all the terms of this statement. Please use this product strictly in accordance with the instructions in this manual. We do not assume any liability arising from misuse, illegal modification or improper operation of this product, including but not limited to indirect losses or joint and several liabilities.

Cautions

Before connecting the ESC to related equipment, please ensure that all wires are well connected and the connecting equipment are in well insulated protection to avoid damaging the ESC due to short circuit.
Before using the ESC, please carefully read the instructions of the matching power equipment and frame to ensure a reasonable power combination, thereby avoiding improper power combination that may lead to motor overload and damage to the ESC.

1. Specifications:

Item	Description	
Current	200A Continuous Current	Self-developed current control algorithm reduces impact of pulse current on motor and drivetrain
Power supply	3~8S LiPo	When using DC power supply instead of pure battery supply, its discharge and the power recovery capability must be considered. If the power supply capacity is limited, the operating parameters (such as acceleration and corresponding braking options, etc.) can be appropriately modulated.
Recommended motor	sensorless square wave brushless motors	
BEC	Voltage: 6.0V/7.4V/8.4V, it can be switched through the mobile APP. Current: 8A continuous, 25A peak	
Wireless connection	All parameters can be adjusted via Mobile App	
Dimension	69.20(L)*56.80(W)*42.30(H)mm / ≈ 226g (with wire)	

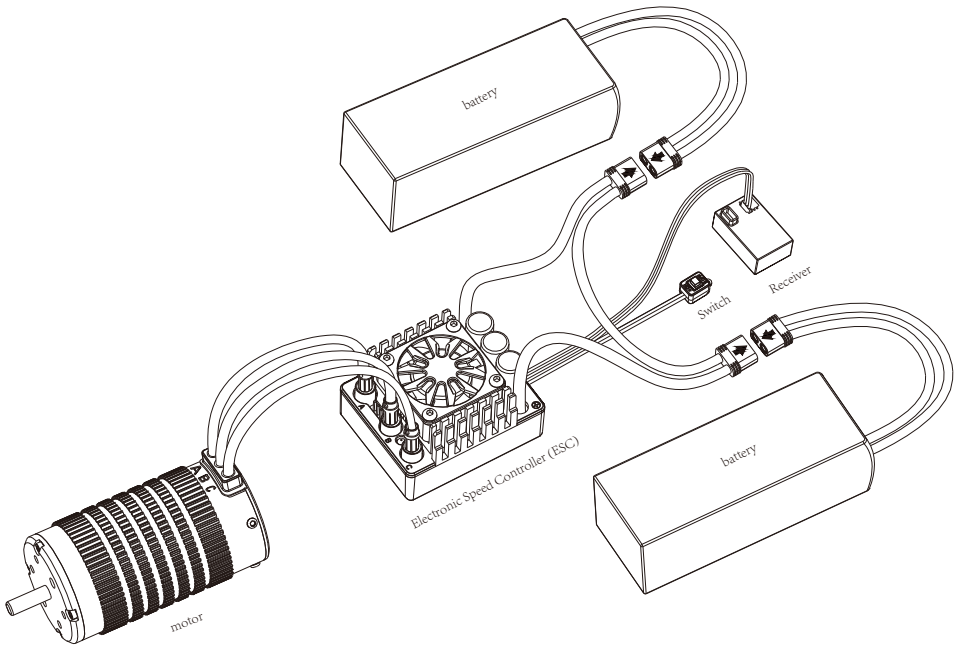
2. Features:

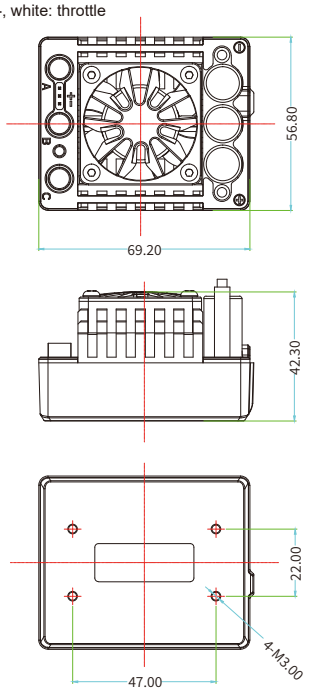
1.Crafted smooth motor commutation scheme, even in sensorless mode
2.Built-in Wireless connection for parameter setting
3.Powerful internal DC/DC convert circuit make BEC loading capacity potent
4.Multiple protection: low voltage protection, throttle loss protection, abnormal braking protection, over temperature protection etc.
5.Ready-to-run, plug and play
6.Effective current control algorithm reduces impact of pulse current on motor

3. Connections:

Remark: A/B/C of Motor and ESC must be connected correspondingly,
That is: Wire A of motor matches wire A of ESC, wire B of motor matches wire B of ESC, wire C of motor matches wire C of ESC

Switch wire: red and black
Throttle wire: red: BEC+, black: BEC-, white: throttle





*Precautions:

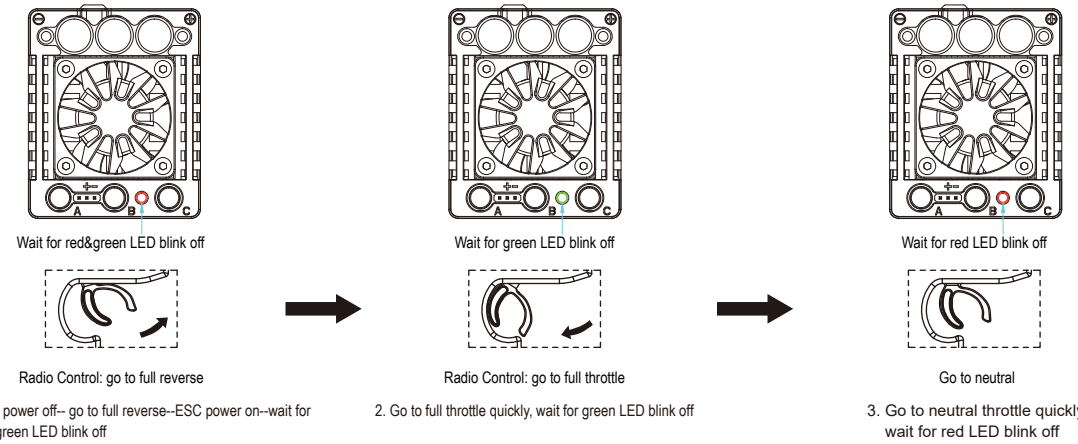
1. Make sure the "+" and "-" of ESC are not connected reversely, otherwise the ESC may be damaged, and it will not be covered by the warranty.
2. Some motors do not support high speeds due to mechanical structure, if the speed is forcibly increased, the motor may be damaged.
3. It's recommended to unplug the power cord of ESC if not in use for a long time.
4. If circuit connection is modified and checked without faults, it's recommended to throttle up slowly. If no abnormalities, the operation of throttle can be recovered.

4. Start the process:

Steps:
1. Check whether the circuit is open, short circuit or in poor contact.
2. Check whether the motor is stuck.
3. Plug in the power cable.
4. Turn on the power button.

When you hear the battery prompt tone (described in the "Normal Startup" prompt in the light/sound prompt section), the startup is normal. If the throttle is normal, you can perform the throttle operation normally.

5. Set the throttle range:



1. ESC power off-- go to full reverse--ESC power on--wait for red/green LED blink off

2. Go to full throttle quickly, wait for green LED blink off

3. Go to neutral throttle quickly, wait for red LED blink off

4.Prompt for success setting: prompt repeats four times(red light and green light on + motor beep"so, mi, do" + red/green lights off + 0.2s vacancy);
prompt for failure setting: no signs, ESC powers on.

6. Wireless connection:

Wireless naming rules: “Product type” + “-” + “ESC ID”. For example, “RTR-1C89”, the “RTR” is a name of product type, “1C89” is hexadecimal ID. This can prevent two or more devices from using the same name. Default password "1234".

7. Configurable items:

Seq	Item	Description				Default
1	Running mode	Forward with brake	Forward&Reverse and Brake	Forward with reverse		Forward&Reverse and Brake
2	LipoCells	Auto	3 ~ 8S			Auto
3	Cutoff Voltage	Disabled	2.9~3.5V			3.2V
4	Motor Rotation	Forward	Reverse			Forward
5	BEC voltage	6.0V	7.4V	8.4V		6.0
6	Max.Brake Force	0~100%				60%
7	Max.Reverse Force	0~100%				25%
8	Punch	0~12 level				6 level
9	Drag Brake Force	0~100%				0%
10	Initial PWM	1~10%				3%
11	Neutral Range of Throttle	2~15%				10%

1. Running Mode:

Option 1: Forward with brake

The vehicle can only move forward and has brake function. This is also commonly acceptable at races.

Option 2: Forward/Reverse and Brake

This option is known to be the “training” mode with “Forward/Reverse with Brake” function. The vehicle only brakes on the first time you push thethrottle trigger to the reverse/brake zone. If the motor stops when the throttle trigger return to the neutral zone and then re-push the trigger toreverse zone, the vehicle will reverse, if the motor does not completely stop, then your vehicle won’t reverse but still brake, you need to return thethrottle trigger to the neutral zone and push it to reverse zone again. This method is for preventing vehicle from being accidentally reversed.

Option 3: Forward and Reverse

When the throttle trigger is pushed from neutral to reverse point, the motor reverses. This mode is generally used in special vehicles.

2. Lipo Cells:

Set the correct value according to the actual number of Lipo batteries used. The default is automatically calculated.

3. 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 is reduced and the power output is completely cut off after a few seconds,and generates a 10% braking force. ForNiMH batteries, it is recommended to set this parameter to “Disabled”.

4. Motor Rotation:

Setting the rotation of the motor. Due to some differences with the drivetrains on different car kits, it is possible to that the car will go in the opposite directionupon full throttle. In the event that this happens, you can set the“motor rotation direction” to the opposite direction; “CW” or “CCW”.

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. WARNING! 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. Max. Brake Force:

This ESC provides proportional braking function; the braking effect is decided by the position of the throttle trigger. It sets the percentage of available brakingpower when full brake is applied. Large amount will shorten the braking time but it may damage your pinion and spur gear.

7. Max. Reverse Force:

Refers to the reversing speed. Selecting different parameter values can produce different reversing speed. It is recommended to use a smaller reversing speed toavoid errors caused by reversing too quickly.

8. Punch:

Set in 0-12 stages, the higher the set value, the faster the acceleration. Kindly take into consideration according to the site, tire grip characteristics, vehicleconfiguration, etc. An aggressive setting may cause the tire to slip, the starting current to be too large and adversely affect the electronics performance.

9. Drag Brake Force:
Refers to the brake force generated by the motor when the throttle trigger returns to neutral position. Choose the appropriate value according to the type of vehicle, configuration, site, etc.

10. Initial PWM:
Also called minimum starting force, it refers to the starting force acting on the motor at the initial position of the throttle. The required starting force can be set according to the tires and site grip. If the venue is too slippery, set a smaller starting force to avoid slipping.

11. Neutral Range of Throttle:
Neutral range could be adjusted according to usage habits. Neutral range may deviate in some radio control, leading to move forward or reverse slowly. If this happens, neutral range needs to be set larger.

8. Recover factory parameters:

How to restore parameters to factory settings:
If you want to restore the parameters to factory settings, just click the default button on the APP parameter page.

9. LED status & beep instructions:

Item	Type description		Light cue	Sound cue	Remark
Basic information	Throttle not zeroed		Red light flashes quickly	Short tone "beep"	Red light flashes quickly
	Throttle signal lost		Red light flashes slowly	Long tone "beep"	In cycle of 2s
	Voltage detection	Low voltage protection	(Redx1 Greenx2) …	Long tone "beep"x1, Short tone "beep"x2	Check the input voltage or setting of number of cells if no "beep" before MOSFET detecting.
		Over voltage protection	(Redx1 Greenx3) …	Nil	Voltage is too high, check whether the voltage is over the withstand value of ESC
	The MOS temperature is too high, operating temp. > 125 ℃ / startup temp. > 110 ℃		(Redx1 Greenx4) …	Long tone beepx1, short tone beepx4	The temperature of MOS is too high. ESC can resume normal operation when the temperature drops below 100 degrees Celsius
Throttle parameters	Abnormal throttle parameters		(Redx1 Greenx7) …	Long tone beepx1, short tone beepx7	If there is still an abnormal promp when positioming throttle to neutral point, throttle calibration process needs to be initiated.
	Throttle calibration prompt	Calibrate low range	(Red Green) …		If the calibration process is irregular or unsuccessful, the ESC will exit the calibration process and enter the normal Startup process.
		Calibrate high range	(Green) …	Nil	
		Calibrate neutral throttle	(Red) …		
		Calibration success	(Red Green) x4	(so-mi-do) x4	
Normal operation	All normal and no action to throttle		(Green) …	Nil	
	Throttle operation	Normal	The greater the accelerator, the faster the green light flashes		
	Braking		Red light is on	Nil	Red light off when release brake
Normal startup	Prompt for the number of battery cells after normal startup		Quinary prompt light signal, long tone with red light on, short tone with green light on	do, mi, so + quinary prompt sound	do, mi, so: prefix of quinary number Quinary definition Long tone = 5 cells, short tone = 1 cell Example: 8-cell lithium battery prompt sound do, ri, mi + long tone x1 + short tone x3
Fault warning	ESC self check abnormality		(Redx2) …	Nil	Disconnect the motor wires, power on. if it is still abnormal,return it for maintenance
			(Redx2 Greenx1) …	Nil	
			(Redx2 Greenx2) …	Nil	

*Notes:
1. Red light matches long tone, gree light matches short tone.
2. For saving power, all "beep" lasts for 5mins; if all fault recovered, it takes effect again in next 5 mins.
3. Ellipsis"..." in light cue represents repetition of previous action.