Brushless ESC's User Manual

DECLARATION

Thanks for purchasing our SKY-series Brushless Electronic Speed Controller (ESC). High power system for RC model can be very dangerous, so please read this manual carefully. In that we have no control over the use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of the product. Any claims arising from the operating, failure of malfunctioning etc. will be denied. We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation for compensation is limited to the invoice amount of the product in question.

FEATURES

- All firmware and components are purchased from renowned makers.
- Multiple motor timing choices, so compatible with most brushless motor in the market.
- Compatible with fixed-wing and helicopter.
- If the position of the throttle stick is inadequate when power on, the motor will not start and emit " Beep-beep-" continuous warnings.
- Multiple protection features: Over-heat protection and throttle signal loss protection, low voltage cut-off protection.
- Throttle range setting and multiple accelerations start up choices.

Wires Connection

(Connectors should be soldered carefully to the cables and insulated with heat shrink tube to avoid shortcut)

SETTINGS (Words in Bold Black are default settings)

1．Brake：ON/**OFF**
2．Battery type：NiMH/**LiPo**
3．Low Voltage Cutoff Type：**Reduce Power**/Cut off Power

Note: When ESC is in low voltage or over heat to slowly reduce the motor power state, no matter what the throttle sticker position is, the power will reduce to a certain value to stabilize the system.

4．Cut off Voltage Threshold (Low Voltage Protection Threshold)：
Low /**Medium** /High

1). For LI-xx packs - ：number of cells are automatically calculated. This ESC provides 3 setting options for the low voltage protection threshold; Low (2.8V)/Medium (3.0V)/High (3.2V).

For example:

the voltage cutoff options for a 3 cell Li-Po pack would be 3.0x3=9V(Medium).

2) For Ni-xx/LiFe packs-low / Medium / High cutoff voltages are 0%/60%/65% of the initial voltage of the battery pack. 0% means no protection. For example: A fully charged 6 cell NiMh pack's voltage is 1.44Vx 6=8.64V, when "Medium" cutoff voltage is set, the cutoff voltage is:8.64V x 60%=5.18V.

5. Motor Timing：Low/**Medium**/High

In most cases, low timing works well for all types of motors. However, the structure for motors are different, please try to use different timing for a better effect. For higher speed, High timing can be set. Some motors require different setups therefore we suggest you to follow the manufacturer recommended setup.

Note: Run you**r** motor on the ground first after making any changes to your motor timing.

6．Soft Acceleration **Startup Mode**：Very Soft/**Soft Acceleration**/Start Acceleration Start Acceleration mode is suitable for fixed wing, Very Soft and Soft Acceleration suitable for Helicopter. The initial rpm for Very Soft and Soft Acceleration is relatively low, even if the throttle stick is moved to the top position instantly, the slow will be provided from start to full rpm.

7．Active RPM **Fixed Wing**/Helicopter

Note: Rpm On：There will be a 8-second delay from start to full rpm.

Attention： After start up, if throttle cut off in less than 3 second, then the next start will be as Rpm off mode, if throttle cut off in more than 3 seconds, then the next star will be in Rpm on mode. Once the governor Mode is enabled, the ESC's Brake and Low

Voltage Cutoff Type settings will automatically be reset to No Brake and Reduce Power respectively regardless of what settings they were previously set.

8. Motor Rotation: **Forward**/Reverse

In most cases motor rotation is usually reversed by swapping two motor wires. However, in cases where the motor cables have been directly soldered the ESC cables, motor rotation can be reversed by changing the value of setting on the ESC.

9. Restore factory setup defaults: Restore – Sets the ESC back to factory default settings;

Throttle range setting:

1. Turn on transmitter, move throttle stick to top position, connect battery pack to ESC and wait for 2 seconds until you hear "toot-toot-" emits.

2. The tone of "toot-toot-" will repeat for 4 times, during these times, move the throttle stick to bottom position, the motor emits special tones, means the setting of throttle range is completed. After 1 second, the system will enter the battery cells confirmation program and emit "123" for system OK tones.

Note: In order to make ESC compatible with your transmitter's throttle range, if you use this ESC for the first time or if you change to use other transmitter, you must reset the throttle range by following above mentioned steps。

Program Setting:

Program the ESC with your transmitter (4 Steps):
1. Enter program mode
2. Select programmable item
3. Set item's value (Programmable option)
4. Exit program mode

1. Enter Program Mode
1).Switch on transmitter, move throttle stick to top position
2).Connet battery pack to ESC and wait for 2 seconds
3).Motor emit 4 times of "toot-toot-" tone which means program mode is entered.

2. Select programmable item:
After entering program mode, you will hear 9 tones in a loop with the following sequence. If you move the throttle stick to bottom and hear one group of special kind of tones, the item will be selected.

1. "toot-"   brake   (1 short)
2. "toot-toot-"   battery type   (2 short)
3. "toot-toot-toot-"   cutoff mode   (3 short)
4. "toot-toot-toot-toot-" cutoff threshold   (4 short)
5. "toot----   motor timing   (1 long)
6. "toot----toot-"   startup   (1 long 1short)
7. "toot---toot-toot- "   governor   (1 long 2 short)
8. "toot----toot-toot-toot-"   rotation   (1 long 3 short)
9 "toot----toot-toot-toot-toot-" default   (1 long 4 short)

3. Set item value (Programmable option)
You will hear several tones in loop. Set the value matching to a tone by moving throttle stick to the top position when you hear the tone, then a special tone emits, means the value is set and saved. (Keeping the throttle stick at the top position, you will go back to step 2 and you can select other item; Disconnect the battery pack will exit the program mode directly).

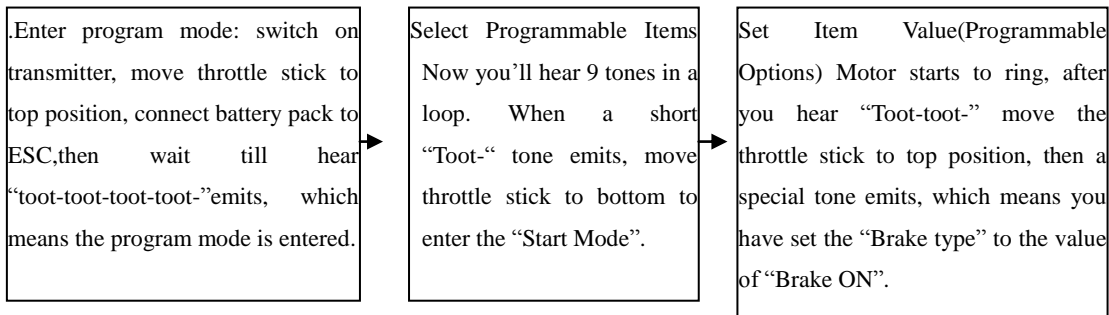| Items \ Tones	"Toot-"	"Toot-toot-"	"toot-toot-toot-"	"toot-toot-toot-toot-"
	1Short	2 Short	3 Short	4 Short
Brake	Off	On		
Battery Type	NiMH/NiCd	Li-ion/NiCd		
Cutoff Mode	Reduce	Cut-off		
Cutoff Threshold	Low	Medium	High	
Motor Timing	Low	Medium	High	
Startup Acceleration	Very Soft	Soft	Acce	
Governor Mode	RPM Off	RPM On		
Motor Rotation	Forward	Reverse		
Default Setting	Restore			

3. Set item value (Programmable option)

You will hear several tones in loop. Set the value matching to a tone by moving throttle stick to the top position when you hear the tone, then a special tone emits, means the value is set and saved. (Keeping the throttle stick at the top position, you will go back to step 2 and you can select other item; Disconnect the battery pack will exit the program mode directly).

Tones	"Beep-"	"Beep-beep-"	"beep-beep-beep-"	"beep-beep-beep-beep-beep-"
Items	1Short	2 Short	3 Short	4 Short
Brake	Off	On		
Battery Type	NiMH/NiCd	Li-ion/NiCd		
Cutoff Mode	Reduce	Cut-off		
Cutoff Threshold	Low	Medium	High	
Motor Timing	Low	Medium	High	
Startup Acceleration	Very Soft	Soft	Acce	
Governor Mode	RPM Off	RPM On		
Motor Rotation	Forward	Reverse		
Default Setting	Restore			

Program Example

Setting "Brake" to "Brake ON", i.e. option #2 of the programmable item #1.

.Enter program mode: switch on transmitter, move throttle stick to top position, connect battery pack to ESC,then wait till hear "toot-toot-toot-toot-"emits, which means the program mode is entered.	→	Select Programmable Items Now you'll hear 9 tones in a loop. When a short "Toot-" tone emits, move throttle stick to bottom to enter the "Start Mode".	→	Set Item Value(Programmable Options) Motor starts to ring, after you hear "Toot-toot-" move the throttle stick to top position, then a special tone emits, which means you have set the "Brake type" to the value of "Brake ON".

Trouble Shooting

Trouble	Possible Reason	Solution
After power on, motor does not work, no sound is emitted	The connection between battery pack and ESC is not correct	Check the power connection. Replace the connectors.
After power on, motor does not work, such an alert tone emits: "beep-beep-, beep-beep-,beep-beep-"	Throttle sticker is not on bottom position or input voltage is abnormal, too high or too low.	Check the voltage of battery pack or move the throttle sticker to the right position.
The motor doesn't run smoothly or stop running while in condition of starting up sudden acceleration.	Battery's power doesn't discharge well. Motor rotation too high. Start Up accelerate sets too high. Motor timing too low.	Change to use bigger discharge power battery. Change to use low rotation motor. Start up accelerate sets lower. Changes to bigger motor timing.
The motor runs in the opposite direction	The connection between ESC and the motor need to be changed.	Swap any two wire connections between ESC and motor.