SURPASS HOBBY FLIER Series ESC User Manual

Thank you for purchasing Surpasshobby product, this is a powerful RC hobby product rather than a toy. It must be operated with care and common sense of safety. Any wrong operation may cause personal injury or damage the product. This product does not allow children to use it without the direct supervision of an adult. Before installation and use, please read and follow the operating procedures specified in this manual. We do not assume any liability arising from the use of this product, including but not limited to compensation for incidental or indirect loss; at the same time, we do not assume any liability arising from unauthorized modifications to the product.

IMPORTANT WARNINGS

- SURPASS HOBBY is not responsible for your use of this product, or any damage or injuries you may cause or sustain as a result of its usage.
- 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 them with enough respect.
- We recommend you to remove the propeller when you working on the plane that with power source connected.
- Observe all local laws when you fly a RC airplane.
- Never fly over others or near crowds.

KEY FEATURES

1. Adopting new generation craft on the MOSFET, low heat generation, withstand large current instantly, and high reliability.
2. Adopting high performance 32 bit microprocessor, stronger computing ability and faster running speed.
3. Super smooth start-up and accurate throttle linearity.
4. Higher driving efficiency and more energy-saving.
5. Adjustable SBEC 5V/6V output voltage 5V/6V provides more powerful power to the servo. (40A/50A/60A/80A/100A have SBEC adjustable)
6. Multiple protections: start-up, over-heat, low-voltage cutoff, signal loss, phase loss etc.
7. Support high RPM motors, and compatible with most motors in the market.
8. Support programming via LCD program card, easier and more convenient operation(Extra LCD program card needed.)

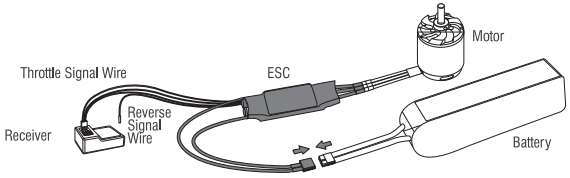
SPECIFICATION

Type	Item Number	Cont./Burst Current(A)	Battery cell NiXX\Lipo	Weight (g)	BEC Output	Size(mm) LxWxH	Connector (mm)	User Program
FLIER 20A	SP-300001-03	20A/30A	5-12NC/2-4Lipo	25	5.5V/4A	60x25x10	3. 5	Yes
FLIER 30A	SP-300002-03	30A/40A	5-12NC/2-4Lipo	25	5.5V/4A	60x25x10	3. 5	Yes
FLIER 40A	SP-300003-03	40A/55A	5-12NC/2-4Lipo	37	5V/6V 4A	68x25x10	4. 0	Yes
FLIER 50A	SP-300004-03	50A/65A	5-12NC/2-4Lipo	37	5V/6V 4A	68x25x10	4. 0	Yes
FLIER 60A	SP-300005-03	60A/80A	5-18NC/2-6Lipo	50	5V/6V 8A	70x34x10	4. 0	Yes
FLIER 80A	SP-300007-03	80A/100A	5-18NC/2-6Lipo	75	5V/6V 8A	90x37x10	4. 0	Yes
FLIER 100A	SP-300008-03	100A/120A	5-18NC/2-6Lipo	80	5V/6V 8A	90x37x10	4. 0	Yes

Wires Connection:

The speed controller can be connected to the motor by soldering directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tube. The maximum length of the battery pack wires shall be within 6 inches.

- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tubes.
- Plug the" JR" connector into the receiver throttle channel.
- Controller Red and Black wires connects to battery pack Red and Black wires respectively.



THROTTLE CALIBRATION

(Important: Please make the throttle calibration for the first time using ESC!!!)

Turn on the transmitter, move the throttle stick to the top position. ▶ Connect the battery pack to the ESC and wait for about 2 seconds. ▼ The motor will beep for twice, then move the throttle stick to the bottom position in 3 seconds. ◀ The motor will beep several sounds, sounds time presents the amount of battery cells. ▼ When the motor emits "Beep---Beep," means the ESC is ready to work.

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. ▼ The motor will beep several sounds, sounds time presents the amount of battery cells. ◀ When the motor emits "Beep----Beep", means self-test is finished, the ESC is ready to work.

PROGRAMMING ITEMS(The option written in bold font is the default setting)

1. SMR Function: **OFF**/ON
   This function supports switching the motor rotation to decelerate when the airplane landing to the ground.
   The factory default is OFF, the 1Pin signal wire is completely invalid at this time. If you need to turn it on, using Phone App or transmitter to program it" ON", 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 SMR 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 when the airplane is landing on the ground, otherwise it may cause the ESC to burn!
2. Brake Type: **OFF**/Soft/Mid/Hard
3. Timing: **Auto**/Low/Mid/High(5°/15°/25°)
4. Motor Rotation: **CW**/CCW
5. SR function: ON/**OFF**
   The synchronous rectification function makes ESC with higher driving efficiency and more energy-saving.
6. Battery cells: **Auto**/2S/3S/4S/5S/6S
7. Low Voltage Cutoff Threshold: OFF/NIMH50%/NIMH60%/**3.0V**/3.2V/3.4V/3.6V
   For example: using 3 lithium batteries and setting 3.0V as the low voltage cutoff value, then the low voltage protection threshold is: 3x3.0 = 9.0V
8. Low Voltage Cutoff Type: **Reduce Power**/Cut Off Power
   Reduced power: When the voltage drops to the set low-voltage protection threshold, the ESC will reduce power to 70%.
   Cut Off power: When the voltage drops to the set low-voltage protection threshold, the ESC will cut off the power immediately.
9. 40A/50A/60A/80A/100A ESCs have adjustable SBEC 5V/6V, the default set is **5.0V**.
10. Acceleration: **Normal**/Soft

ENTERING THE PROGRAMMING MODE

1. Turn on the transmitter, move the throttle stick to the top position.
2. Connect the battery pack to ESC.
3. Wait for 2 seconds, the motor will emit special tone like" beep-beep beep"
4. Wait for another 3 seconds, the motor will emit special tone like" 123", which means program mode entered.

PROGRAMMABLE ITEMS

After entering program mode, you will hear 11 tones in a loop with the following sequence.

Tones	Programmable items	
1)". beep"	SMR Function	(1 short tone)
2)". beep.beep"	Brake Type	(2 short tone)
3)". beep.beep.beep"	Motor Timing	(3 short tone)
4)". beep.beep.beep.beep"	Motor Rotation	(4 short tone)
5)". beep- -"	SR Function	(1 long tone)
6)". beep- -.beep"	Battery cells	(1 long 1short)
7)". beep- -.beep.beep"	Low Voltage Cutoff Threshold	(1 long 2 short)
8)". beep- -.beep.beep.beep"	Low Voltage Cutoff Type	(1 long 3 short)
9)". beep- -.beep.beep.beep.beep"	BEC Voltage	(1 long 4 short)
10)". beep- -beep- -"	Acceleration	(2 long tone)
11)". beep- -beep- -.beep"	Restore Factory Setup Defaults	(2 long 1 short)

Note: 1 long" beep- -" = 5 short" beep"

SET ITEM VALUE

Moving the throttle stick to the bottom position within 2 seconds after one kind of following tones, this item will be selected. After the programmable item selected, then you will hear several tones in loop as follows on each programmable item, set the value matching to a tone by moving throttle stick to top position when you hear the tone, then the motor will emit special tone like " 123", means this value is set and saved.

For example: If you want to set the motor rotation, when you hear four short tones of "Beep", moving the throttle stick to the bottom position within 2 seconds, means you enter the motor rotation menu. One short tone of "Beep" is forward direction(CW), two short tones of "Beep" is reverse direction(CCW). If you want to set to reverse direction(CCW), moving the throttle stick to the top position when you hear the two short tones of "Beep", then you will hear a special confirmation tone like" 123", which means the" CCW" is set and saved.

Keeping the throttle stick at top, you will go back to programming mode and you can select other items; or moving the stick to bottom within 2 seconds will exit program mode directly).

PROGRAMMING TONE REFERENCE TABLE

Items \ Tones	"beep"	"beep.beep"	"beep.beep .beep"	"beep.beep .beep.beep"	"beep--"	"beep— beep"	"beep— beep.beep"
	1short tone	2short tone	3short tone	4short tone	1long	1long 1short	1long 2short
SMR Function	*OFF	ON					
Brake Type	*OFF	Soft Brake	Mid Brake	Hard Brake			
Motor Timing	*Auto	Low	Mid	High			
Motor Rotation	*CW	CCW					
SR Function	ON	*OFF					
Battery Cells	*Auto	2S	3S	4S	5S	6S	
Low voltage Cutoff Threshold	OFF	NIMH50%	NIMH60%	*3.0V	3.2V	3.4V	3.6V
Low Voltage Cutoff Type	*Reduce Power	Cut off Power					
BEC Voltage	*5V	6V					
Acceleration	*Normal	Soft					
Restore Factory Default Sets	Restore						

Note: " * " value means default settings.

PROTECTION FUNCTION

1. 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.)
2. Over-heat protection: When the temperature of the ESC is over about 110°C, 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.
3. 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 recovers during power down, the ESC will immediately resume 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 certain amount of time to save the plane, taking into account safety and practicality.
4. 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.

TROUBLE SHOOTING

Trouble	Possible Reason	Action
After powering up, ESC emits the sound of battery cells, but motor can't run.	ESC doesn't set throttle range.	Set throttle range again.
After powering up, motor doesn't run and doesn't emit any sound.	1.Bad connection between ESC and battery. 2.Bad soldering cause bad contact. 3.Low voltage of the battery. 4.Quality problem of ESC.	1.Clean the connectors or replace them, check the connection polarity. 2.Solder the wires again. 3.Check battery pack, use full-charged battery. 4.Change ESC.
Motor does n't work and no audible tone emitted after connecting the battery. Servos are not working either.	1. Poor/loose Connection between battery Pack and ESC. 2. No power 3. Poor soldered connections 4. Wrong battery cable polarity 5. ESC throttle cable connected to receiver in the reverse polarity	Check all the connections make sure you are doing it right.
Motor does not work but servos do	1. Poor / loose connection between ESC and motor 2. Burnt motor coils 3. The battery pack voltage exceeds the acceptable range. 4. Throttle stick is not at the lowest position 5. The ESC throttle calibration has not set up	1. Check all the connections make sure you are doing it right. 2. Change a new motor. 3. Solder the wires again. 4. Check the battery pack, use full-charged battery. 5. Set throttle range again.
When the ESC is powered on, the motor does not work and an alarm sound (continuously beeping) will sound.	The throttle stick is not in the bottom position after power on.	Move the throttle stick to the bottom position.
Motor runs in reverse rotation	Wrong cables polarity between the ESC and the motor.	Swap any two of the three cable connections between the ESC and the Motor or access the Motor Rotation function via the ESC programming mode and change the pre-set parameters.
Motor stops running in flight.	Lost throttle signal	Check proper operation of the radio equipment. Check the placement of the ESC and the Receiver and check the route of the receiver's aerial and ESC

Shenzhen Surpass Tech co., Ltd
Http: //www.surpass-hobby.com
11024-1070-18