

Thank you for purchasing ZTW Beatles G2 Brushless Electronic Speed Controller (ESC). Please read the safety information contained in this manual carefully before using this product. ZTW Model have no control over the use, installation, application, or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of this item.

IMPORTANT WARNINGS

- ZTW 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 connected in combination with a battery and/or ESC may start unexpectedly and cause serious damage and so should always be used with care and respect.
- We recommend you always remove the propeller when working on a model with the power source connected.
- Follow and observe all local laws and by-laws relating to model flying when flying RC planes.
- Never fly over others or near crowds.

KEY FEATURES

1. Utilizes powerful next generation MOSFET with a low thermal signature, high peak current threshold and reliability.
2. Features high performance 32bit microprocessor as standard. Stronger computing ability and faster processing rates.
3. Super smooth start up and throttle throughout the power range.
4. Higher driving efficiency and more energy-saving.
5. Adjustable SBEC output voltage, 5V/6V.
6. Multiple protection protocols: start-up, over-heat, low-voltage cutoff, signal loss, phase loss etc.
7. Supports wide range of high RPM type motors commonly found in today's market.
8. Fully programmable via optional ZTW mobile app or ZTW LCD programming card.

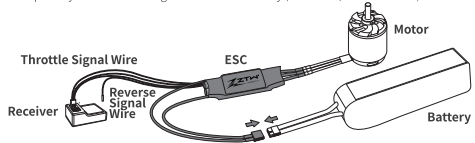
SPECIFICATION

Type	PN#Model	Cont./Burst Current(A)	Battery cell NiXX\Lipo	Weight (g)	BEC Output	Size(mm) L*W*H	User Program
Beatles 20A SBEC G2	3020211	20A/30A	5-12NC\2-4Lipo	26	5V/6V 4A	60*27*9	Yes
Beatles 30A SBEC G2	3030211	30A/40A	5-12NC\2-4Lipo	31	5V/6V 4A	60*27*9	Yes
Beatles 40A SBEC G2	3040211	40A/55A	5-12NC\2-4Lipo	39	5V/6V 4A	68*27*9	Yes
Beatles 50A SBEC G2	3050211	50A/65A	5-12NC\2-4Lipo	39	5V/6V 4A	68*27*9	Yes
Beatles 60A SBEC G2	3060211	60A/80A	5-18NC\2-6Lipo	58	5V/6V 8A	70*35*12	Yes
Beatles 80A SBEC G2	3080211	80A/100A	5-18NC\2-6Lipo	92	5V/6V 8A	90*39*13	Yes
Beatles 100A SBEC G2	3100211	100A/120A	5-18NC\2-6Lipo	98	5V/6V 8A	90*39*13	Yes

Wires Connection:

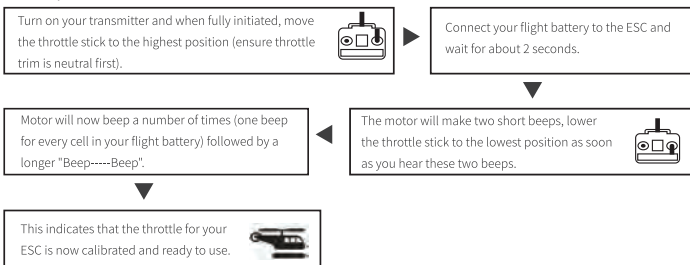
The speed controller is connected to the motor via the three wires coming from the ESC/MOTOR. These wires can be soldered directly together if desired, but the recommendation is to use suitable high quality connectors that are properly soldered to the wires and insulated with heat shrink to connect the ESC and motor wires. Note: It is recommend that your battery wire length not exceed 152mm (6 inches)

- Ensure your choice of connectors/plugs meet the current drawn demands of your set-up (battery and motor connectors/plugs).
- Use heat shrink tubing to cover and insulate all solder joints.
- Servo lead/JR plug from the ESC plugs into the throttle channel of your receiver.
- Reversing lead from the ESC plugs into the single pin of any spare Rx channel and should be assigned to a 2 position switch on your Tx.
- Ensure correct polarity when connecting the ESC to the battery (red to red, black to black).

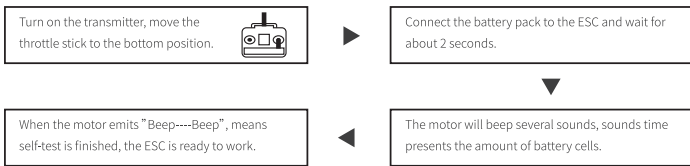


THROTTLE CALIBRATION

(IMPORTANT: Please ensure you manually calibrate the throttle range when using the ESC for the first time. This should always be done with the propeller removed if the ESC is connected to a motor and with the ESC correctly connected to you Rx and your Rx bound to your radio)



NORMAL STARTUP PROCEDURE



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: 3*3.0 = 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

① 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 loss 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

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