ZTW G2 ESC Brushless Electronic Speed Controller User Manual

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ZTW G2 ESC Brushless Electronic Speed Controller

Thank you for purchasing ZTW Shark G2 Brushless Electronic Speed Controller (ESC). Please read this manual carefully before using this product for the sake of safety. 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 of 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 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. The ESC is waterproof and glued, and the flat water-cooling design ensures efficient heat dissipation.
4. Super smooth start-up and accurate throttle linearity make the ESC suitable for all kinds of RC boat models.
5. The ESC has two running modes for different applications: “Forward Only” and “Forward and Backward”.
6. Higher driving efficiency and more energy-saving.
7. Adjustable SBEC 5V/6V output voltage provides more powerful power to the servo.
8. Multiple protections: start-up, over-heat, low-voltage cutoff, signal loss, phase loss.
9. Support high RPM motors, and compatible with most motors in the market.

10. Support programming via Phone App or LCD program card, easier and more convenient operation (Extra TW App adapter or LCD program card needed.)

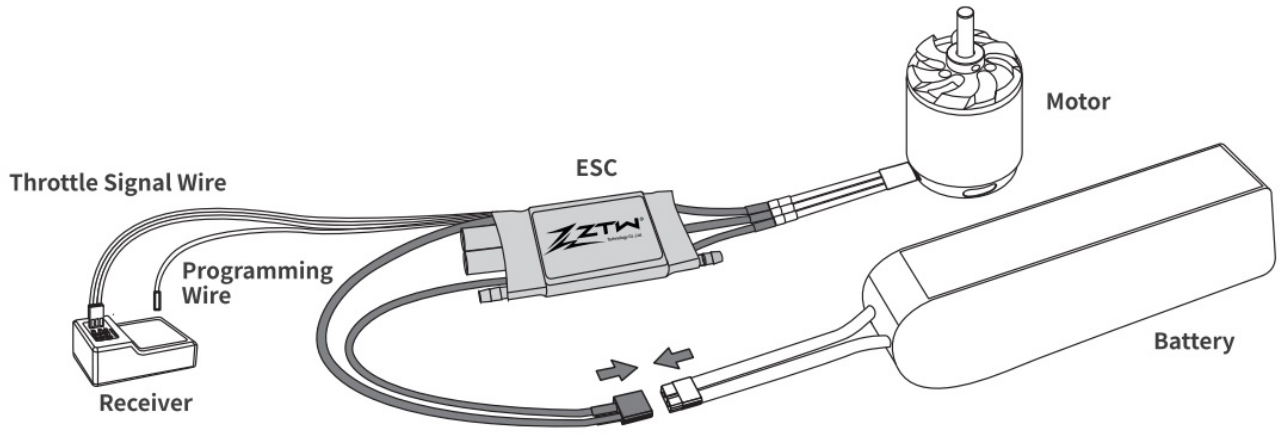
Specification

Type	PN#Model	Cont./Burst Current(A)	Battery cell NiXX\Lipo	Weight (g)	BEC Output	Size(mm) L*W*H	User Program
Shark 20A SBEC G2	7020210	20A\30A	5-12NC\2-4Lipo	32	5V/6V 4A	60*33*10	Yes
Shark 30A SBEC G2	7030210	30A\40A	5-12NC\2-4Lipo	36	5V/6V 4A	60*33*10	Yes
Shark 40A SBEC G2	7040210	40A\55A	5-12NC\2-4Lipo	45	5V/6V 4A	69*33*9	Yes
Shark 50A SBEC G2	7050210	50A\65A	5-12NC \2-4Lipo	45	5V/6V 4A	69*33*9	Yes
Shark 60A SBEC G2	7060210	60A\80A	5-18NC\2-6Lipo	65	5V/6V 8A	70*41*12	Yes
Shark 80A SBEC G2	7080210	80A\100A	5-18NC\2-6Lipo	98	5V/6V 8A	89*45*13	Yes
Shark 100A SBEC G2	7100210	100A\120A	5-18NC\2-6Lipo	105	5V/6V 8A	89*45*13	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.

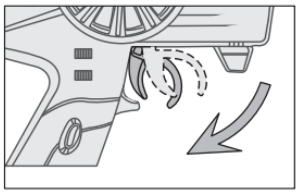
- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tubes.
- Plug the “JR” connector into the receiver throttle channel.
- Controller Red and Black wires connects to battery pack Red and Black wires respectively.



Throttle calibration

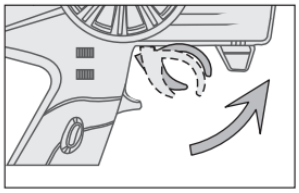
Important: Please make the throttle calibration for the first time using ESC!

Throttle calibration by pistol transmitter:

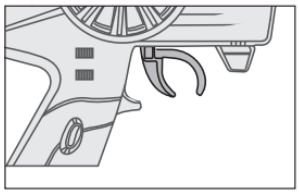


Turn on the transmitter, move the throttle stick to the top position

Connect the battery pack to the ESC and wait for about 2 seconds.

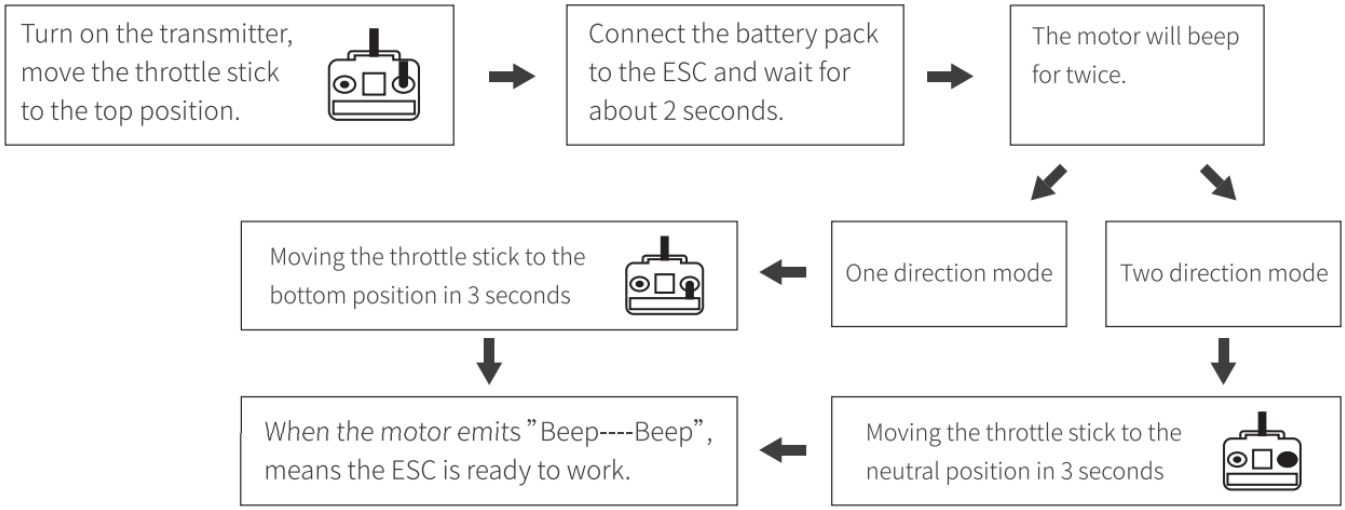


The motor will beep for twice, then release the throttle stick to the neutral position in 3 seconds.

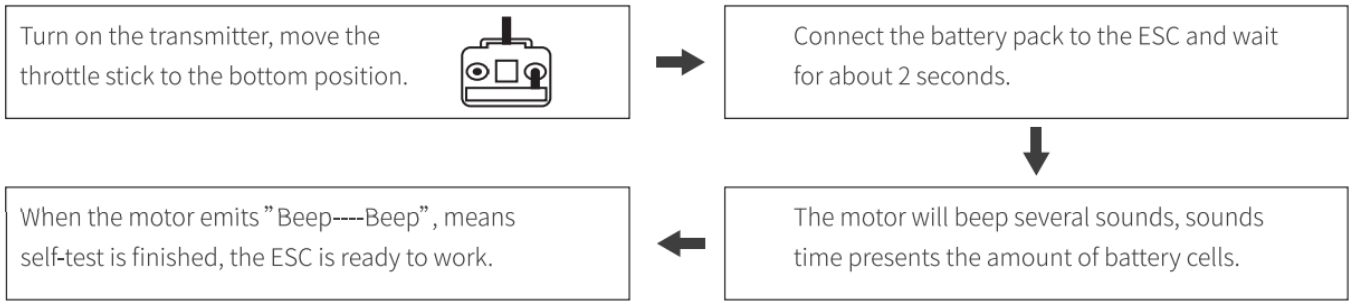


When the motor emits a long “Beep----Beep”, means the ESC is ready to work.

Throttle calibration by stick transmitter



Normal startup procedure



Programming items

Programming items(the option written in bold font is the default setting)

1. Running Mode: Forward Only/Forward and Backward
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/25/35/4S
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.OV 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. BEC: 5V/ 6V
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”	Running Mode	(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 is 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

Tones Items	beep”	“beep.beep „	“beep.beep .beep”	“beep.beep .beep.beep „	beep — “	“beep — b eep”	“beep- – beep.beep”
	lshorttone	2shorttone	3short tone	4shorttone	l long	llonglshort	llong2short
Running Mode	Fwd. Only	*Fwd . & B wd					
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	OFF	NIMH50%	NIMH60%	*3.0V*	3.2V		3.6V
fi1°J0Ttigihold Cutoff Type	•Reduce Po wer	Cut off Pow e r					
BECVoltage	•**sv**	6V					
Acceleration	*N ormal	Soft					
§ 1 W { gory	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 the 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 increases 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 the throttle range.	Set the throttle range again.
After powering up, motor doesn 't run and doesn't emit any sound.	l.Bad connection between ESC and battery 2.Bad soldering cause bad contact. 3.Low voltage of the battery. 4.Quality problem of ESC.	l.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 doesn't work and no audible tone emitted after connecting the battery. Servos are not workingeither.	1. Poor/loose Connection between battery Pack and ESC. 2. No power 3. Poor soldered connections 4. Wrong battery cable polarity 5. ESC throtl connected to receiver in the reverse polarity	Check all the connections make sure you are doing it right.
Motor does not work but the 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 th rottl ecalibration has not set up	l. Check all the connections make sure you are doing it right. 2. Chang ea new motor. 3. Solder the wires again. 4. Checkthe 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 cable 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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Documents / Resources

	**ZTW G2 ESC Brushless Electronic Speed Controller** [pdf] User Manual G2 ESC Brushless Electronic Speed Controller, G2 ESC, Brushless Electronic Speed Controller, Electronic Speed Controller, Speed Controller, Controller

References

- **User Manual**