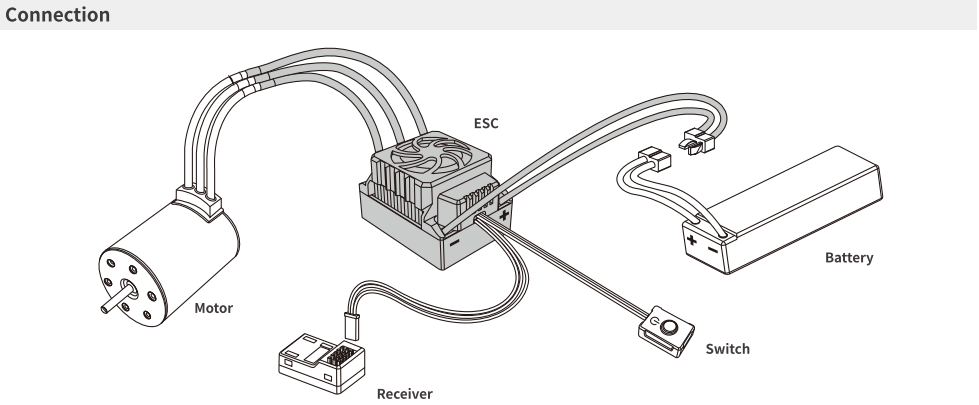


Thank you for your purchasing the ZTW product, Beast G2 series ESC is our new generation brushless electronic speed controller (RTR version). The high power systems for RC models can be very dangerous, we strongly suggest that you read this manual carefully before using your speed control. ZTW Model 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.

- Caution
- Do not let children use this product without the supervision of an adult.
 - The ESC might get hot during use, be careful when handling it.
 - When soldering input/output wires and connections, set the iron to 60W minimum.
 - Always disconnect the battery after use, do not store with the battery connected.
 - Do not use near flammable materials.
 - If the ESC overheats, emits smokes or burns, immediately discontinue use, disconnect the battery and seek assistance.

- Features
- Completely water-proof and dust-proof.
 - 32-bit microprocessor can support more powerful processing capability and more accurate motor output.
 - Excellent start-up, acceleration and linearity features.
 - Multiple protection features: Low voltage cut-off protection, over-heat protection and throttle signal loss protection.
 - Be easily programmed with LED Program Card.

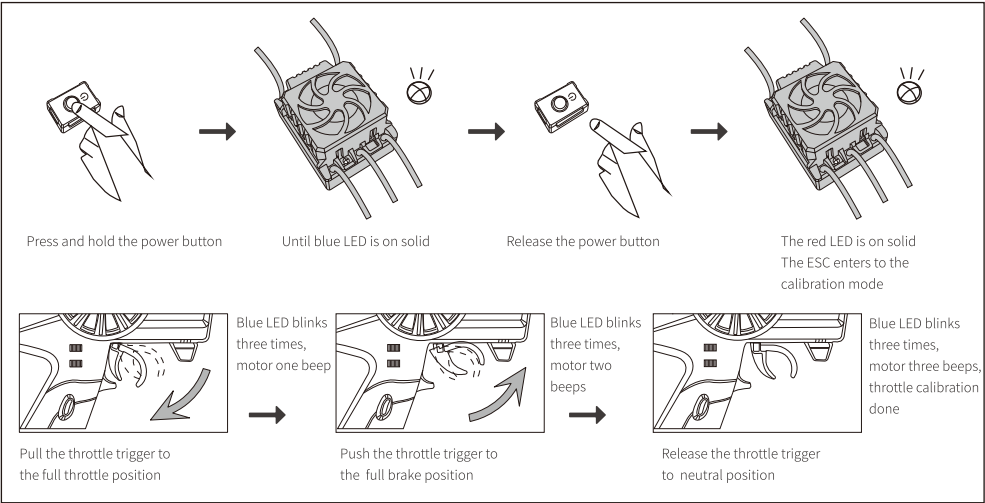
Product Name	Cont./ Peak Current	Input	BEC Output	Size(mm)	Weight(g)	Program By	Waterproof	Car Applicable
Beast SL 50A G2	50A/300A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48*38*32	95g	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 60A G2	60A/360A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48*38*32	96g	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 80A 2-3S G2	80A/420A	2-3S LiPo/ 6-9 Cells NiMH	6V/3A	48*38*32	111g	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 80A 2-4S G2	80A/420A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	48*38*32	116g	LED	Support	1/10 Touring Cars/ Buggies/Trucks/ Monster Trucks
Beast SL 120A SCT G2	120A/720A	2-4S LiPo/ 6-12 Cells NiMH	6V/3A	56*38*33	128g	LED	Support	1/10th SCTs/ Truck/Monster Trucks
Beast SL 150A G2	150A/900A	2-6S LiPo/ 6-16 Cells NiMH	6V/7.4V/6A	55*48*37	165g	LED	Support	1/8th Touring Cars/ Buggies/Trucks/ Monster Trucks



- Battery Wire Connection
- When connecting the battery, pay attention to polarity: incorrect connection will damage the ESC and Battery.
- As shown in the figure above, connect the positive (+) wire is connected to (+) battery port, and the negative (-) wire is connected to the (-) battery port.
- Motor Wire Connection
- The #A, #B, #C wires of the ESC can be connected with the motor wires freely (without any sequence). If the motor runs in the opposite direction, please swap any two wire connections.
- Receiver Wire Connection
- The signal wire supplies 6.0V to the receiver, servo, etc. So there is no need to connect an additional battery. External power connected to the receiver may damage the ESC.
- | | |
|------------|-----------|
| Black wire | RX- |
| Red wire | RX+6.0V |
| White wire | RX-Signal |

- Software Functions and Settings
- Power On/Off ESC
1. Press the power button then the ESC will be powered on.
 2. Press and holding the power button until the all LEDs died out, then the ESC will be powered off.
(Note: Please place the throttle trigger on the neutral position: within 10%, otherwise the ESC can not be powered off.)
- Throttle Calibration
1. Connect the ESC with the battery and receiver well, then turn on the transmitter.
 2. Press and holding the power button until the blue LED is on solid, the motor have a long beep at the same time, then release the power button, the red led will be on solid, the ESC enters to the calibration mode.
 3. Pull the throttle trigger to the full throttle position, the blue led blinks three times and the motor beeps once, the full throttle position is saved.
 4. Push the throttle trigger to the full brake position, the blue led blinks three times and the motor beeps twice, the full brake position is saved.
 5. Release the throttle trigger to the neutral position, the blue led blinks three times and the motor beeps three times, the throttle calibration is completed.
 6. The ESC can support reverse throttle calibration, if the transmitter throttle set reverse (it means pull the throttle will go to 1000 throttle position/normally is 2000, and push the throttle will go to 2000 throttle position/normally is 1000), then you do the throttle calibration the same way as usual (as above), it will not have any effects on the ESC forward and revers way even if the transmitter throttle set reverse.

Remark: No need to restart the ESC again after throttle calibration finished.
Do not move the throttle during the time of the blue led blinks.



- LED Program Card
1. How to connect
Connect the ESC with the battery, power on the ESC, then plug the ESC signal wire into the right socket of the LED, wait for two seconds until LED is on, you are ready to program.
 2. How to program
Press MENU button to select the main menu, press VALUE button to select the sub-menu, press OK button to confirm, press RESET button to reset.
For example: if you want to set Neutral Range at 8%, press MENU button to select 03, and press VALUE button to select 02, then press OK button.
If you want to reset the ESC value, press the RESET button first, then press OK button.
Check the picture on the right for detail LED programmable value.
-

LED Status

1. During operation

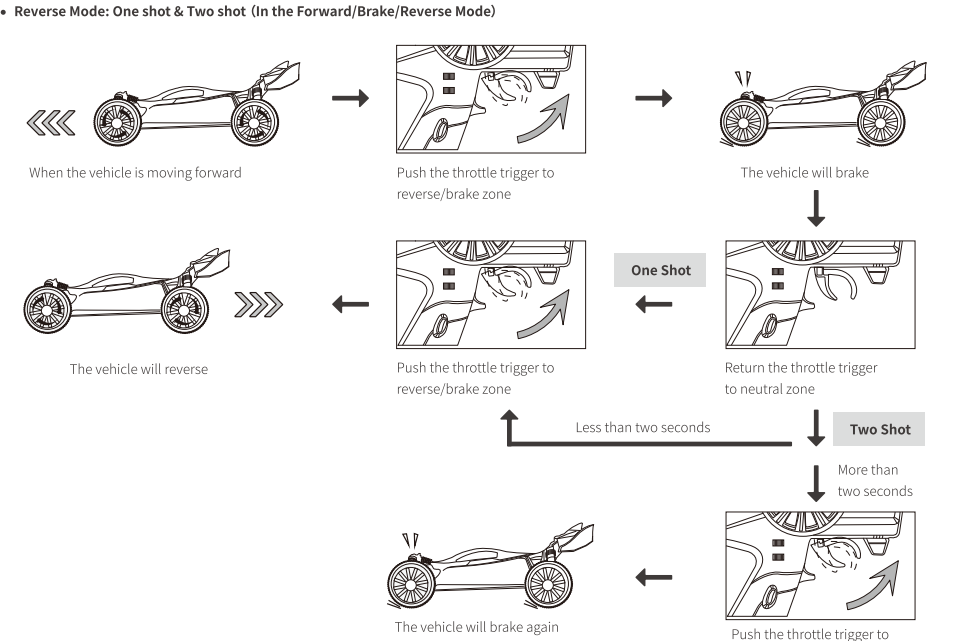
Throttle Position	Blue LED	Red LED
Neutral	Blinking	OFF
Full Throttle	ON	ON
Full Brake	OFF	ON

- Note: When you pull the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will go faster when the throttle goes higher.
2. When some protection is activated
 - The RED LED is always on solid once the power button is pressed.
 - The RED LED blinks, single flash between every one second. Repeat like “α α α” indicates that the voltage is abnormal.
 - The RED LED blinks, double flash between every one second. Repeat like “αα αα αα” indicates that the temperature is abnormal.
 - The RED LED blinks, single and double flash alternately between every one second. Repeat like “α αα α αα αα” indicates that both of the voltage and temperature is abnormal at the same time.
 - The RED LED will not have any responds even the voltage or temperature is abnormal if not detect the signal.
 - The BLUE LED blinks,double flash between every two seconds. Repeat like “αα αα αα” indicates that the throttle is abnormal.
(No throttle, or the throttle is not on the neutral position)

- Throttle Signal
1. The ESC can support the 450Hz maximum PPM throttle signal.
 2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash:
 - The throttle trigger do not place on the neutral position when the ESC turns on.
 - Lost the throttle signal.
 3. If the ESC lost throttle signal during the operation, the BLUE LED will blink double flash, and the ESC will start to work again until the throttle signal is back to normal.
- Sensorless
1. The PWM driving frequency will be selected automatically by the ESC on sensorless mode, and the manual setting is invalid.
 2. It is invalid to set the brake PWM frequency less than 1KHz and forced recognized as 1KHZ, if the ESC is on sensorless mode.

- Protection
1. High Voltage Protection:
If the ESC detected the voltage too high(Higher than the esc standard voltage), when the ESC turns on, and the voltage protection was not set “OFF”, then the voltage protection will be activated, and the maximum throttle output will be limited within 50%.(The high voltage protection only worked on the moment of the ESC turns on, and it will not work on the other stages even it detected the high voltage, once the high voltage protection opened, even though the voltage comes down to the normal voltage, the protection will not be relieved.)
 2. Low Voltage Protection:
If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%.(Once the low voltage protection activated, even though the voltage comes back to normal, the protection can not be relieved.)
 3. Thermal Protection:
The output throttle from the ESC will be limited (not over 50%) with the thermal value you have preset.(The Thermal protection will be dismissed when the ESC temperature drop to 65°C)
 4. If the voltage protection and temperature protection set off, and when the voltage and temperature become abnormal, the LED status will indicates the problems correspondingly, but will not limit the throttle output and will not close all ESC timing.
 5. If the ESC detected the motor have the driving problem (like motor rotor locked or motor phase lost problem) which can cause the motor not run smoothly, and when the throttle trigger leave neutral position for a while, then the ESC driving abnormal protection will be activated, and the motor will emit special tone like beep-beep-beep (note: some motors can not beep or beep with a low sound if motor have phase loss problem), and the protection will be closed until you released the throttle trigger to neutral position for 0.2 seconds. If this problem occurs three times continuously, then you have to solve the motor driving problem first,or the protection will exist all the time.

- Programmable Items Description
1. **Throttle Response:** The shorter the time, the quicker the acceleration.
 2. **Coast:** With this function activated, the car won’ t slow down immediately but coast for a while when reducing the throttle input.
 3. **Neutral Range:** The wider the neutral range, the further the throttle trigger/stick must be moved away from the neutral point. Otherwise, the car won’ t move.
 4. **Min. Throttle:** The bigger the value, the more aggressive the start-up when moving the throttle trigger/stick away from the neutral range.
 5. **Max. Forward force:** The lower the value, the slower the maximum speed in the Forward direction.
 6. **Max. Reverse force:** The lower the value, the slower the maximum speed in the Reverse direction.
 7. **Brake Response:** The shorter the time, the quicker the braking.
 8. **Min. Brake Force:** After entering the braking mode, the higher the value, the stronger the brake force when moving the throttle trigger/stick away from the neutral range.
 9. **Max. Brake Force:** The lower the value, the weaker the maximum brake force.
 10. **Fwd. Drag Brake Force:** The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.
 11. **Rev. Drag Brake Force:** The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.
 12. **Motor Rotation:** It’ s the direction in which motor spins. With the factory default setting, it may run in the opposite direction in some scenarios. This function allows users to switch the rotational direction if necessary.
 13. **Running Mode:** There are three running modes: Forward/Brake, Forward/Brake/Reverse, and Forward/Reverse.
 14. **Reverse Mode:**It’ s only available when the running mode is set to Forward/Brake/Reverse. There are two options: One Shot (pull the throttle trigger/stick once) & Two Shots (quickly pull the throttle trigger/stick twice).
 15. **CutOFF Voltage:** With it set to “Auto”, the ESC will automatically identify the number of LiPo cells you’ ve plugged in the moment it’ s powered on.
 16. **Thermal Protection:** The ESC will automatically cease operation when the internal temperature rises above user-selectable values.
 17. **BEC Output:**Select the output of the Battery Eliminator Circuit depending on the operating voltage requirements of the servos.



Trouble Shooting

Trouble Shooting	Possible causes	Solutions
The ESC was unable to start the status LED, the motor, and the cooling fan after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check if all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
The motor suddenly stopped or significantly reduced the output in operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the battery LVC (Low Voltage Cut off) protection. 3. The ESC entered the thermal (over-heat) protection.	1. Check all devices and try to find out all possible causes, and check the transmitter’ s battery voltage. 2. The RED LED blinks, single flash between every one second. 3. The RED LED blinks, double flash between every one second.
The motor stuttered but couldn’ t start.	1. Some soldering between the motor and the ESC was not good. 2. The ESC was damaged (some MOSFETs were burnt).	1. Check all soldering points, please re-solder if necessary. 2. Contact the distributor for repair or other customer services.
The car ran forward/backward slowly when the throttle trigger was at the neutral position.	1. The neutral position on the transmitter was not stable, so signals were not stable either. 2. The ESC calibration was not proper.	1. Replace your transmitter 2. Re-calibrate the throttle range or fine tune the neutral position on the transmitter.