




Thank you for purchasing the Speed Passion Cirtix series electronic speed controller (ESC). High power systems for RC models can be very dangerous, so we strongly suggest you read this manual carefully. In that we have no control over the correct use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of the product. Any claims arising from the failure of the ESC, malfunctioning etc. will be denied. We assume no liability for personal injury, consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation to compensation is limited to the invoiced amount of the affected product.

Features:

This Cirtix ESC is suitable for 1/10 1/12 cars and 1/10 trucks

- ◆ Compatible with all sensed and sensorless brushless motors,
- ◆ Built in ESC enhancement feature will allow updates to the latest **DRRS** Version 2.0 software and future new software developments. (**Cirtix ESC PC-USB adaptor** "PN#SPESCPB01" is sold separately, please contact your local dealer or distributor for more information). Please visit www.speedpassion.net to look for new updated software and features for your Cirtix series ESC.
- ◆ **New "Cirtix - Dynamic sensor technology series" feature.** A state of the art new development in software will give you top efficiency and wide power band for consistent performance and highest power output!
- ◆ Proportional ABS brake function with 9 steps of brake adjustment, 9 steps of Auto drag-brake adjustment.
- ◆ New Digital Racing Response modes Version 2.0 (From Level 1 - smooth to Level 9 - aggressive) **"Digital Racing Response System - DRRS" (note 1).** Fully upgradeable for different modes and levels of tuning.
- ◆ Multiple protection features: Low voltage cut-off protection for lithium battery / Over-heat protection / Throttle signal loss protection / Motor locked protection.
- ◆ **New "Dynamic Multi Timing System - DMTS"** special 8 mode adjustment system design for any brand of brushless motor to bring out top performance for both the ESC and motor.
- ◆ 3 running modes (**Forward with brake "No Reverse"**, **Forward with reverse** and **Direct Forward/reverse with brake**)
- ◆ Easy one button programming and compatible with pocket-sized SMART ESC program unit.

Specifications:

Model	  
Burst Current	90A
Resistance	0.005 ohm
Battery(note 3)	4-9 Cell Ni-xx (NiMh or NiCd) or 2 Cell Li-Po / 2 to 3 Cell Li-Fe • For 4-6 Cell Ni-xx or 2s Lipo: Use the standard fan supplied with the ESC; For 7-9 Cell Ni-xx: You must change the fan because it cannot work with such a high voltage, so please choose a high voltage fan or supply the fan from the receiver (+5V); (note 2)
BEC Output	6.0V/BEC 2A
ESC Type	D-Manager 2.0 / Inspire 2.0 Sensor less Short Course Master sensed
Motor Type	Sensorless or Sensed brushless motor
Dimension	32mm (L) x 28mm (W) x 18mm (H) w/o cooling fan
BL Motor Limited	Max > 9.5T "4000KV motor"
Support USB Software upgrade	Yes
ESC Fan	25MM

Note 2: The value of "T" number is tested under the following conditions:

- a) The input is a 6 cell Ni-xx battery; b) The ESC is equipped with a fan.

Note 3: The voltage of fan socket on the ESC is equal to the voltage of the battery, it is directly supplied without any regulation, so please keep in mind that the voltage of battery CANNOT over the voltage limit of the fan, that is: 7.2V.

ESC's indicating LEDs:

* When Power wires on the ESC are connected with the battery pack, the ESC can automatically identify the motor type (Sensed/Sensorless) via indicated LED.

*If the ESC works at the status of Sensored, remove the Sensor wire, the ESC can be automatically change to the status of Sensorless.

Sensored/Sensorless ESC's indicated LED		
Status of the function	INDICATED LED	Status of the LED
Low voltage of the battery	Red LED	Blinking
Over-heat of the ESC and motor (95°C)	Orange LED	Blinking
Sensored motor	Red and Orange LED	ON
Sensorless motor	Orange LED	ON
Sensorless ESC's Indicating LED		
Function	Indicating LED	LED Status
Low voltage of the battery	Red LED	Blinking
Over-heat of the ESC and motor (95°C)	Orange LED	Blinking
Sensorless motor	Orange LED	ON

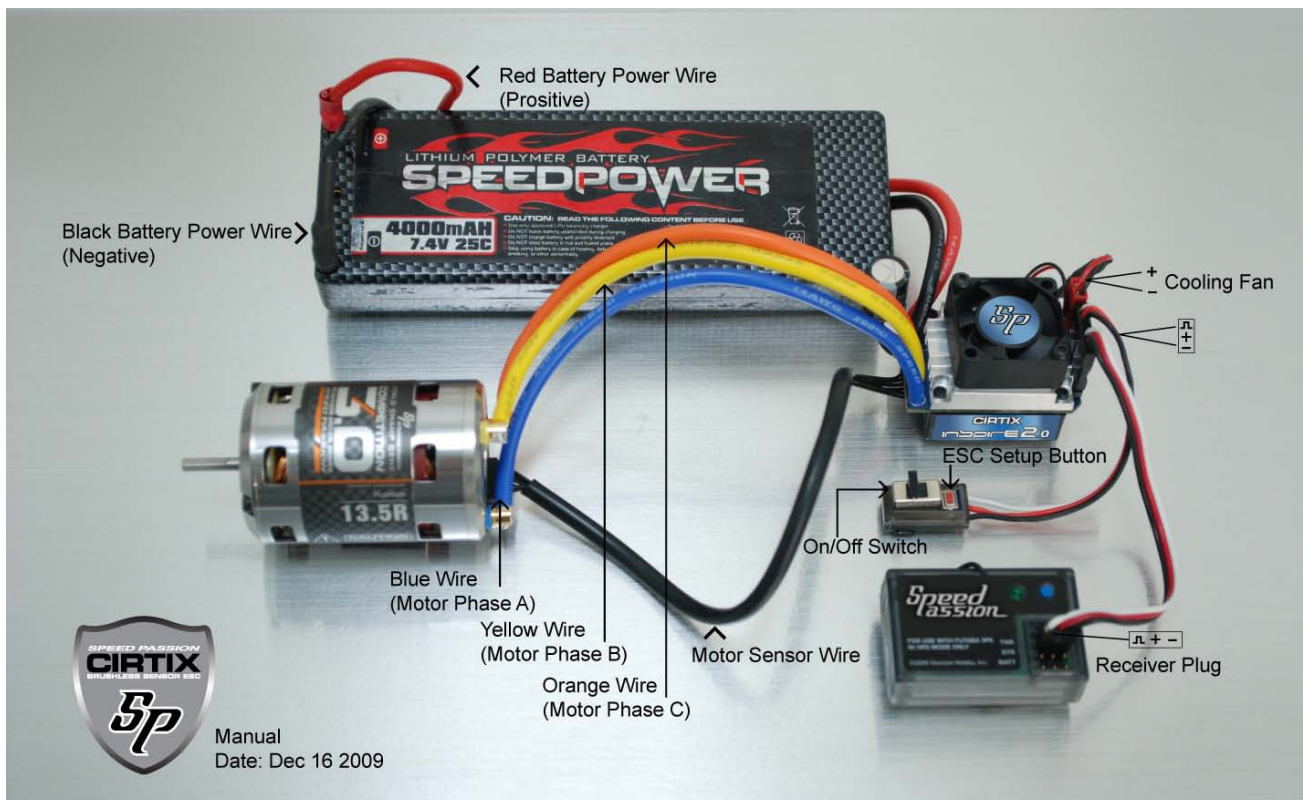
Using Your New ESC

Wiring Diagram:

1. Connect the ESC, motor, receiver, battery and servo according to the following diagram

"+" and "-" wires on the ESC are connected to the battery pack, and the #A, #B and #C are connected to the motor. The "SET" button is used for programming the ESC. The "Fan" connector is used to supply the cooling fan. The receiver cable of the ESC (trio wires with black, red and white color) is connected to the throttle channel of the receiver (Usually CH2).

NOTE: The Capacitor **MUST** be connected to the (+) and (-) of the ESC. The ESC **WILL** be damaged if it is operated without the capacitor



a) Brushless Motor Wiring ★ Connected with sensored brushless motor

When using a sensored motor, it is necessary to connect the sensor cable to the "SENSOR" socket on the ESC. The ESC can automatically identify the motor type (sensored or sensorless) by detecting the signal coming from the SENSOR socket.

WARNING! When using sensored brushless motor, the #A, #B, #C wires of the ESC **MUST** connect with the motor wire #A, #B, #C respectively. Do not change the wire sequence!

★ **Connected with sensorless brushless motor**

When using brushless motor without Hall Sensor, the #A, #B, #C wires of the ESC can be connected with the motor wires in any order. If the motor runs backwards, swap any two of the motor wire connections.

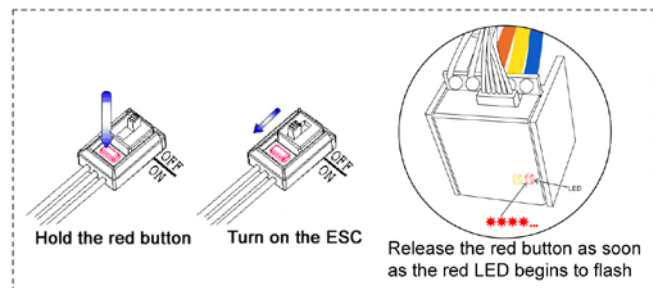
Picture A: Wiring with a brushless motor

2. Throttle Range Setting (Throttle Range Calibration)

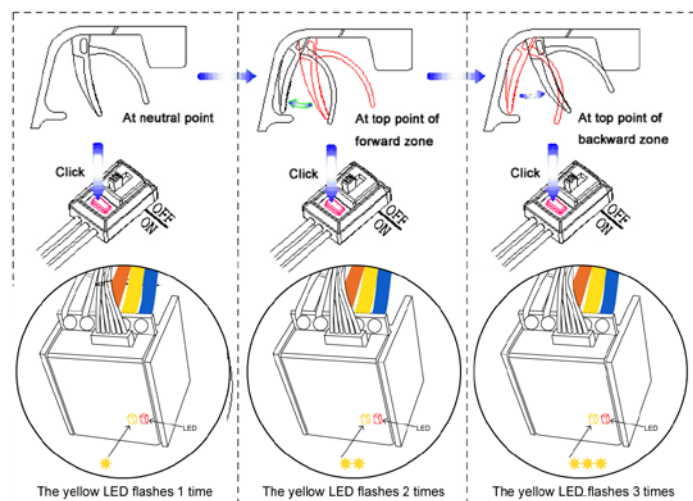
In order to make the ESC fit the throttle range, you must calibrate it when you set up a new ESC, use a new transmitter, or change the ATV or EPA settings of the radio. You must also calibrate after loading new software to your ESC. Otherwise the ESC will not work properly.

There are 3 points need to be set, "full throttle", "full brake" and the neutral point.

The following pictures show how to set the throttle range with a Futaba™ transmitter.



- A) Switch off the ESC, turn on the transmitter, set the direction of throttle channel to "REV" (ONLY for Futaba Radios), set the "EPA/ATV" value of throttle channel to "100%".
- B) Use a pen or screwdriver to hold the "SET" key and then switch on the ESC, release the "SET" key when the red LED begins to flash.
- C) (Please refer to the picture on the right)



- C) Set the 3 points according to the steps shown as the picture.
 - ★ Neutral point
 - ★ Full throttle
 - ★ Full brake
- D) When the process of calibration is finished, the motor can be started after 3 seconds.

3. The LED Status In Normal Running

- ★ After the radio setup completed with the ESC, when every time you tune on the ESC switch to "ON" please wait 3 sec before operate.
- ★ The yellow LED goes on which mean you are in Neutral point.
- ★ The yellow LED goes off when the car is run forward and will light up in neutral or under braking.

Alert Tones

1. Input voltage abnormal alert tone: The ESC begins to check the input voltage when power on, if it is out of the normal range, the following alert tone will be emitted: "beep-beep-, beep-beep-, beep-beep-" (There is 1 second interval between every "beep-beep-" tone).
2. Throttle signal abnormal alert tone: When the ESC can't detect the normal throttle signal, the following alert tone will be emitted: "beep-, beep-, beep-" (There is 2 seconds interval between every "beep-" tone).

Protection Function

1. Low voltage cut-off protection: If the lithium battery pack's voltage is lower than the threshold for 2 seconds, the ESC will cut the output power. Please note that the ESC cannot be restarted if the voltage of each lithium cell is lower than 3.5V. You can disable cutoff voltage protection function for competition racing.
For NiMh/NiCd battery packs, if the voltage of the whole NiMh/NiCd battery pack is higher than 12V, it will be considered as a 4 cell lithium battery pack; If it is higher than 9.0V but lower than 12V, it will be considered as a 3 cell lithium battery pack; If it is lower than 9.0V, it will be considered as a 2 cell lithium battery pack. For example, a NiMh battery pack is 8.0V, and the threshold is set to 2.6V/Cell, so it will be considered as a 2 cell lithium battery pack, and the low-voltage cut-off threshold for this NiMh battery pack is $2.6 \times 2 = 5.2V$.

2. Over-heat protection: When the temperature of the ESC is over 95°C for 5 seconds, the ESC will cut off the output power. You can disable over-heat protection function for competition race.
3. Throttle signal loss protection: The ESC will cut off the output power if the throttle signal is lost for 0.2 second.

Trouble Shooting

Always start troubleshooting by resetting the ESC to the throttle range of the transmitter. Calibration will most likely solve the issue. (Throttle range calibration above)

Optional Accessories for Upgrade

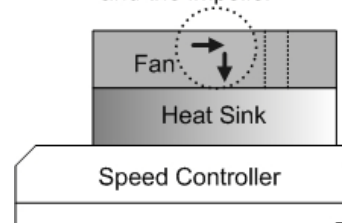
We provide the following optional accessories for upgrade your power system:

1. **Heat sink fan (8V):** The fan is necessary when you are using battery pack more than 6 cell NiMh/NiCd or 2s Lipo. It is located on the heat sink of the ESC, it helps to cool the ESC with downward airflow. The picture on the right side shows the installation.

WARNING! Please note the fan sold with the ESC can **ONLY** work with a 2 cell lithium battery pack or 4-6 cell NiMh / NiCd battery pack. Please **NEVER** use it with a 3-4 cell lithium battery pack or NiMh / NiCd battery pack more than 7 cells, otherwise it may be destroyed.

Please check the label of the fan to confirm its working voltage before using it.

Mark: Direction of the airflow and the impeller



Trouble	Possible Reason	Solution
After power on, motor doesn't work, no sound is emitted	The connections between battery pack and ESC are not correct	Check the power connections Replace the connectors
After power on, motor can't work, but emits "beep-beep-, beep-beep-" alert tone. (Every "beep-beep-" has a time interval of 1 second)	Input voltage is abnormal, too high or too low.	Check the voltage of the battery pack
After power on, motor can't work, but emits "beep-, beep-, beep-" alert tone. (Every "beep-" has a time interval of about 2 seconds)	Throttle signal is abnormal	Check the transmitter and the receiver Check the wire of the throttle channel
The motor runs in the opposite direction	The wire connections between ESC and the motor need to be changed	Swap any two wire connections between the ESC and the motor.(Attention: This method only applies to sensorless motors)
The motor suddenly stops running while in working state	The throttle signal is lost	Check transmitter and the receiver Check the throttle channel polarity Reset ESC throttle range to transmitter
	The ESC has entered the Low Voltage Protection Mode	Replace the battery pack
Random stop or restart or irregular working state	Some connections are not reliable	Check all the connections: battery pack connections, throttle signal wire, and motor connections, etc. Reset ESC throttle range to transmitter
	There is strong Electro - Magnetic interference field.	Reset the ESC to resume normal operation. If the function could not resume, you might need to move to another area to run the car.

2. High capacity filtering capacitors with extreme lowest resistance.
3. Multi ESC Program Card.

Program the ESC

Program card is an optional accessory which may be purchased separately.

Programming the ESC is very easy and fast with this pocket sized device. To change settings, just plug the receiver wire from the ESC (trio wires with black, red and white color) into the socket of the program card (The socket is on the right corner, and marked with $\oplus \ominus \text{I}$), and then power up the ESC, each item's value will be shown on the program card. Use "ITEM" and "VALUE" buttons to select the programmable items and new values, and press the "OK" button to send the new settings into the ESC.



ESC PC Program Method and update ESC software:

1. The Speed passion Program Card is used to make all adjustments to the active profile in your ESC. Any active profile can be modified by PC software with **Cirtix ESC PC-USB adaptor**. Connect the **Cirtix ESC PC-USB adaptor** PN#SPESCPB02 with USB cable to your PC or Laptop computer.
2. Insert Speed passion CD-ROM to your PC or Laptop computer.
3. Plug the **Cirtix ESC PC-USB adaptor** into your PC or laptop computer.
4. Connect the SPEED PASSION **Cirtix ESC PC-USB adaptor** to the mini USB connector on the USB Cable
5. You will be prompted to install the device drivers, they are both unsigned to select OK and continue. After a few moments, the USB adapter LED will turn from Red to Blue.
6. If your Adapter LED remains Red, then disconnect the Adapter, wait a minute and then reconnect. If the Blue LED does not come on, reboot your system.
7. You will be prompted to install the device drivers, they are both unsigned to select OK and continue. After a few moments, the USB adapter LED will turn from Red to Blue.
8. If your Adapter LED remains Red, then disconnect the Adapter, wait a minute and then reconnect. If the Blue LED does not come on, please reboot.
9. **Note:** If working with Windows 2000, you will be required to reboot before the USB Adaptor gets connected and the small LED on the adapter turns from Red to Blue.
10. •With the Speed passion USB Adapter LED now Blue, you are ready to start the Speed passion Software. Locate and select the Speed Passion icon on your desktop.
11. Notice in the Connection box the USB is Green and the ESC is still Red.



12. You are ready to connect the Adapter to the ESC, using the Signal Wire.
13. Please note the label on the **Cirtix ESC PC-USB adaptor**, there are 3 color bars each marked and indicating how to connect the Receiver wire to the adapter.
14. With the ESC connected to the **Cirtix ESC PC-USB adaptor**, the Speed passion Software Connection status icons should now both be GREEN.





15. The speed passion software is now installed and ready for use.
16. Please refer to the section (above) for a general overview and field specific help.
17. Take a moment to review the selectable functions and read the specific help text for each to become familiar with them. To make configuration changes to a function select the setting you want, and from the drop down menu select your new choice or option. When you are satisfied and finished with this configuration, click the "SEND Settings" button located on the bottom (off center) of each tabbed page.

Connection: This section is displayed on every Tab. There are two icons; one for the USB connection, the other indicates the Electronic Speed Control connection. They are RED in color when disconnected and GREEN on connection.

Note: Without an understanding of a specific function and reason, it is not recommended that you make changes to the "default" configuration. There have been defaults selected as a direct result of our testing, which was used to establish these settings. Changing of the configuration will be at your own risk.

★ In the program process, the motor will emit "Beep" tones at the same time as the LED is flashes.

Programmable Items list

Attention: The Grey color texts in the above form are the default settings.

Programmable Items	Programmable Value								
	1	2	3	4	5	6	7	8	9
Basic Items									
1. Threshold V/Cell Lipo Cut off	2.6V/Cell	2.8V/Cell	3.0V/Cell	3.2V/Cell	3.4V/Cell	No Protection			
2. Running mode	Forward with brake "No reverse"	Forward with reverse	Forward /reverse with brake						
3. Dynamic Multi Timing System – AMTS 2.0	0~	3.75~	7.5~	11.25~	15~	18.75~	22.5~	26.5~	
4. Digital Racing Response System – DRRS 2.0 *	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9
Advanced Items									
5. Throttle Percent Reverse	20%	30%	40%	50%	60%	70%	80%	90%	100%
6. Throttle Limit Power output control	0%	20%	30%	40%	50%	60%	70%	80%	90%
7. Percentage Braking – ABS	20%	30%	40%	50%	60%	70%	80%	90%	100%
8. Percent Drag Brake	0%	10%	20%	30%	40%	50%	60%	70%	80%
9. Over Heat Protection	Enable "95 °C Cut off"	Disable							
10. Neutral Range	2%	4%	6%	8%	10%	12%			

Note * : RS1 is Level 6 , RS2 is Level 7

18. Programmable Values

18.1. Threshold V/cell Lipo cut off

- **Customize Voltage Cutoff** you can select a starting cutoff voltage of **2.6V/cell, 2.8V/cell, 3.0V/cell, 3.2V/cell, 3.4V/cell** and **No Protection**.

According to the type of your batteries, set up the type of the batteries and Low Voltage Cutoff Threshold via PC software or program card. The ESC can detect the Voltage of the battery anytime and will stop working once the Voltage of the battery is lower than the preset Low Voltage Cutoff Threshold

18.2. Running Mode:

Forward with Brake" No reverse " mode. The car has forward and brake, but cannot use reverse. This mode is suitable for competition. This is a Race setting - Reverse is disabled.

"Forward/Reverse with Brake" mode provides reverse function, which is suitable for practice.

Note: "Forward/Reverse with Brake" mode uses "double-tap" method to engage reverse, i.e. when you first apply brakes (The 1st "tap"), the ESC begins to brake and the motor reduces speed, but it will not engage reverse. When the throttle is moved back to neutral and quickly back to brake, (The 2nd "tap") reverse will engage as long as the car is stopped. The "Double-tap" method can prevent mistakenly reversing if the brakes are frequently used.

At any time in the process of braking or reversing, if forward throttle is applied, the motor will respond at once.

- **Forward / Reverse with brake** – This is only to determine if reverse is to be enabled or not.

You will find in racing, most tracks will not allow racing with reverse enabled.

Note: *There is automatic protection within the Speed passion ESC. Only after you have stopped and returned the trigger to neutral will reverse become available. If while traveling in reverse, pull the trigger to go forward. This is to help prevent serious damage to the drive train.*

- **"Forward with reverse" mode**

Should you get into a situation that requires reverse, after you have applied any brakes you may have needed, return the throttle trigger to the neutral position? Wait a moment or two and then push the trigger forward for reverse.

18.3. "Dynamic Multi Timing System – AMTS 2.0":

- Customer can select a timing system of **0~, 3.75~, 3.75~, 7.5~, 11.25~, 15~, 18.75~, 22.5~, 26.5~**.

This parameter is only available for brushless motors. There are many differences among styles and parameters of different brushless motors, so a fixed timing ESC is not ideal for all brushless motors. It is necessary to make the timing value programmable. Please select the most suitable timing value according to the motor you are using. Generally, higher timing value brings out higher power output, but at the expense of excess motor heat.

Note: ESC timing advance adds with any physical advance already used on the motor itself. If the ESC value is 11.25, and you have 5.0 set on the motor, the total advance will be 16.25.

Please note that the "timing" value will be available for both sensored and sensorless brushless motors.

18.4. "Digital Racing Response System - DRRS" Digital Racing Mode:

- Customer can select the response system of **LV 1, LV 2 LV 3, LV 4, LV 5, LV 6, LV 7, LV 8, LV 9**

Select from "smooth" to "aggressive" response system as you like. The higher number will provide more punch and more aggressive throttle response. Please note that if you choose "Level 9" mode, we strongly recommend you'd use good quality battery pack with powerful discharge ability; otherwise these modes will not give the effect you want.

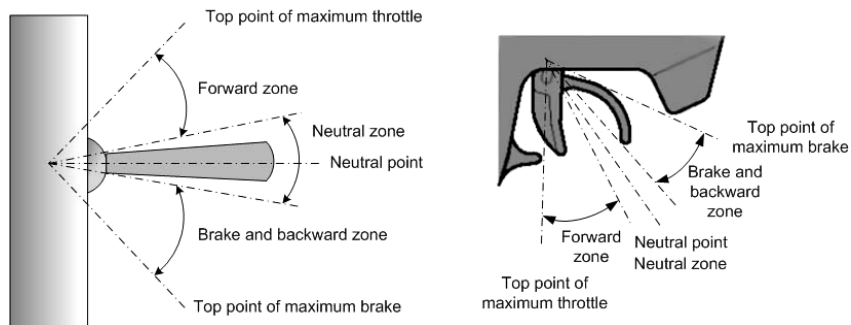
- 18.5. **Throttle Percent Reverse Force:** Sets how much power will be applied in the reverse direction. Different value gives different reverse speeds.

- 18.6. **Throttle Limit Power Output control:** Use this to limit the power available using forward throttle. The lower the percent the less forward throttle speed will be available.

- 18.7. **Percentage Braking-ABS :** The ESC provides a proportional brake function. The brake force is related to the position of the throttle stick. Maximum brake force refers to the force when the throttle stick is located at the top point of the braking zone. A very large brake force can shorten the brake time, but it may damage the gears.

- 18.8. **Percent Drag Brake :** Set the amount of drag brake applied at neutral throttle to simulate the slight braking effect of a neutral brushed motor while coasting.

- 18.9. **Over Heat Protection:** If the function is activated, the output power will be cut-off when the temperature of the ESC or the internal temperature of the motor is up to 95°C for more than 5 seconds. When the protection engages, the power to the motor will be cut off.
- 18.10. **Radio Neutral Range: (Deadband)** Please see the following illustrations to adjust the range as you like.



At any time when the throttle is located in neutral zone (except in the throttle calibration or parameters program process), hold the "SET" key for over 3 seconds, the red LED and yellow LED will flash at the same time, which means each programmable item has been reset to its default value.

Exemption Clause:

Speed Passion does not have control over the installation or use of this product therefore no liability for any damages incurred in its use will be accepted. Operation of this product is at the user's risk. The use of R/C models requires a degree of skill, If you are a beginner please consult the advice of an experienced user to prevent injury to goods or other persons.

Caution:

1. Do not operate the ESC at voltages lower than 4.8V or higher than 8.4V battery, damage to the ESC can result.
2. When mounting the brushless motor in your car, pay careful attention to the length of the motor screws, they must not exceed 4.0mm in depth, longer than this and internal damage to the motor will result, which will void the product warranty.
3. Ensure all connections are secure before using this product.

ESC product warranty period:

Product Warranty:

Please see the full warranty terms and procedures on www.SpeedPassion.net for your country and product before returning any product.

User accepts all resulting liability. We reserve the right to modify warranty provisions without notice. Warranty does not cover incorrect installation, components worn by use, or any damage caused by crash, flooding or natural disaster. The company has no control over the installation of this product; no liability may be assumed nor will be accepted for any damage resulting from the use of this product.