

## ERUN-20A V1.0 Manual

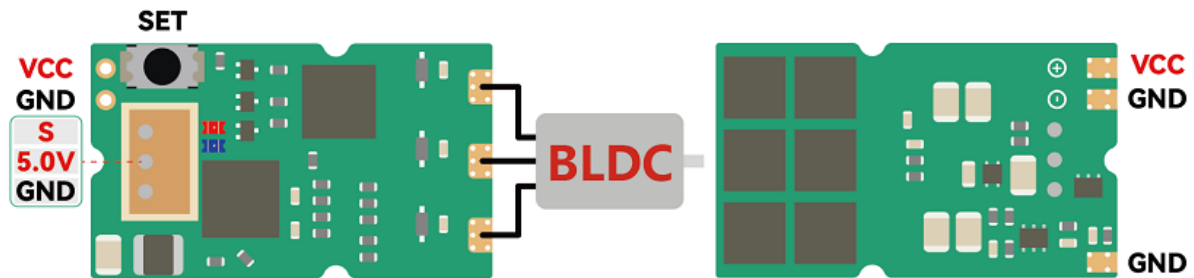
Please, read this document carefully before using!

ERUN-20A is an ultra-small sensorless brushless ESC for RC cars. Its volume is much smaller than similar products, so users can easily install it on 1/28~1/24 RC cars.

### Features :

- Ultra small size : 21.5\*12.5\*7.0mm ;
- Weight : 2.25g ;
- BEC : 2.0A/5V ;
- Working voltage: 6.0~12.4V ;
- Working current : 20A/40A(Max) ;
- Support THR range and midpoint setting ;
- 3 running modes : F&B, F/R&B, F/R ;
- 4 steps of maximum reverse force adjustment ;
- 9 start modes from "Short" to "Smooth" to be suitable for different chassis, tires and tracks ;
- Proportional ABS brake function with 4 steps of maximum brake force adjustment ;
- 8 steps of drag brake force adjustment and 4 steps of initial brake force adjustment ;
- Support Low voltage cut-off protection for Li\_Po or nickel battery ;
- Support Over-heat protection / THR signal loss protection / Motor blocked protection ;
- 8 steps of timing adjustment ;
- 10 programmable parameters ;
- 1.5mm 3P servo connector ;

### Interface :



### THR Range and Midpoint Setting (THR Range Calibration) :

In order to make the ESC fit the THR range, you must calibrate it for the following cases, otherwise the ESC cannot work properly. The calibration operation must be performed when the following situations occur:

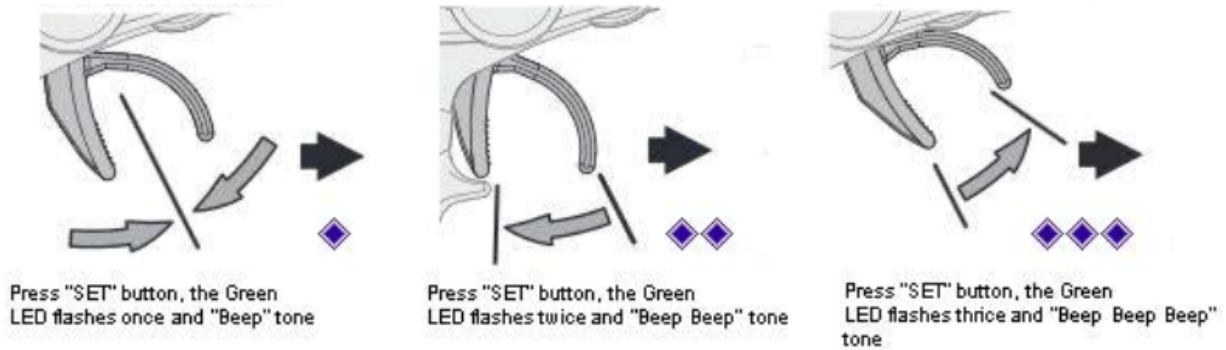
- 1) Begin to use a new ESC ;
- 2) Begin to use a new transmitter ;
- 3) Change the settings of neutral position of the THR, ATV or PA parameters, etc.

There are 3 points to be set, they are the top point of "forward", "backward" and "midpoint". The calibration method is as follows:

- A) Power off the ESC, turn on the transmitter, set the direction of THR channel to "REV", set the "EPA/ATV" value of THR channel to "100%" and disable the "ABS" brake function of your transmitter ;

B) Hold the "SET" key and then power on the ESC, when the blue LED begins to flash, release the key immediately ;

C) Follow the steps shown in the figure below to set three points in sequence: 1. Midpoint; 2. End point of forward direction; 3. End point of backward direction.



D) When the process of calibration is finished, the motor can be started after 3 seconds.

Note: If the "SET" button is not released after the blue LED flashes, the ESC will enter the programming mode. In this case, please turn off the ESC and recalibrate the throttle range from step A to step D.

**The LED Status in Normal Running :**

- 1) When the THR lever is in neutral, the blue LED and red LED are off.
- 2) When the car is moving forward, the blue LED is always on, and the red LED is on when the THR stick is at the top position (100% throttle).
- 3) When the car is braking, the blue LED is always on, the red LED will also be on when the throttle stick is at the bottom position and the maximum brake force is set to 100%.
- 4) When the car is reversing, the blue LED is always on. the red LED will also be on when the throttle stick is at the bottom position and the maximum reverse force is set to 100%.

**Programmable Parameter Table :**

MEUN	Programmable value								
	1	2	3	4	5	6	7	8	9
1.Runing Mode	F & B	F/ R &B	F / R						
2.DragBrakePower	0%	5%	10%	20%	40%	60%	80%	100%	
3.LowVolt CutOFF	NO CutOFF	2.6V/ Cell	2.8V/ Cell	3.0V/ Cell	3.2V/ Cell	3.4V/ Cell			
4.Start Mode	Level1	Level2	Level3	Level4	Level5	Level6	Level7	Level8	Level9
5.BrakePower	25%	50%	75%	100%					
6.ReversePower	25%	50%	75%	100%					
7.InitialBrakePower	Drag Brake	0%	20%	40%					
8.THR NeutralRange	6%	9%	12%						
9.Timing	Level1	Level2	Level3	Level4	Level5	Level6	Level7	Level8	
10.OverHeatProtection	Enable	Disable							

**Programmable Parameter Menu :**

1) Running Mode: "Forward with Brake"(F & B) mode, the car can go forward and brake, but cannot go backward, this model is suitable for competition; "Forward/Reverse with Brake" (F/R&B) mode provides backward function, which is suitable for training. The "Forward/Reverse" (F/R) mode is only used for rock crawler.

Note: "Forward/Reverse with Brake" mode uses "Double-Click" method to make the car go backward. When you move the throttle stick from forward zone to backward zone for the first time, the ESC begins to brake the motor, the motor speeds down but it is still running, not completely stopped, so the backward action is not happened now. When the throttle stick is moved to the backward zone again (The 2\*click'), if the motor speed is slowed down to zero (i.e. stopped), the backward action will be occurred. The "Double-Click" method can prevent mistakenly reverse when the brake function is frequently used in steering. With "Forward/Reverse" mode, the reverse action will be happened immediately when the throttle stick is moved to backward zone. Please set the "Drag Brake Force" to 100% if you choose the "Forward/Reverse" mode.

2) Drag Brake Force: Set the amount of drag brake applied at neutral throttle to simulate the slight braking effect of a neutral brushed motor while coasting.

3) Low Voltage Cut-off: mainly to prevent over-discharge of the Li Po battery pack. When using a Li Po battery pack, please set an appropriate low-voltage protection value. ESC monitors battery power at any time, if the voltage is lower than the threshold, the output power will be reduced to 50% in 2 seconds. Please stop as soon as possible at this time.

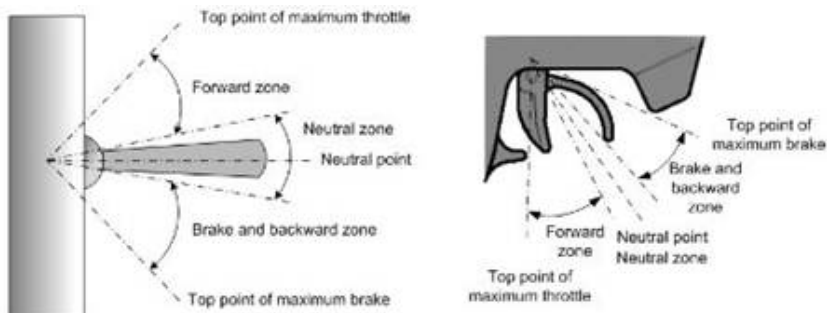
4) Start Mode (Also called "Punch"): Select from "Level 1 (Soft)" to "Level 9 (Very aggressive)" start mode as your like. Please note that if you choose "Level 7" to "Level 9", you'd better use good quality battery pack with powerful discharge ability, otherwise these modes cannot get the bursting start effect as you want. If the motor cannot run smoothly (the motor is trembling), it may caused by the weak discharge ability of the battery pack, please choose a better battery or increase the gear rate;

5) Maximum Brake Force: The ESC provides proportional brake function. The brake force is related to the position of the throttle sticks. Maximum brake force refers to the force when the throttle stick is located at the top point of the backward zone. A very large brake force can shorten the brake time, but it may damage the gears.

5) Maximum Reverse Force: Sets how much power will be applied in the reverse direction. Different value makes different reverse speed.

7) Initial Brake Force: It is also called "minimum brake force" and it refers to the force when the throttle stick is located at the initial position of the backward zone. The default value is equal to the drag brake force, or the brake effect can be very smooth.

8) Throttle Neutral Range: Please see the following illustrations to adjust the neutral range as your like.



9) Timing: Different brushless motors have many differences in structure and parameters, and ESCs with a fixed timing are difficult to be compatible with all brushless motors. The timing value must be programmable. Please select the most

suitable timing value according to the motor you are using. Generally speaking, a higher timing value brings higher power output, but the overall efficiency of the system will decrease.

10) Over-Heat protection: If this function is activated, the output power will be cut off when the temperature of the ESC is higher than the factory set value and the time exceeds 5S. When protection occurs, the blue LED will flash.

### **Restore Factory Settings :**

At any time when the throttle is at the midpoint (except during throttle calibration or parameter programming), press and hold the "SET" button for more than 3 seconds, the red LED and green LED will flash at the same time, which means that each programmable item has been reset to its Defaults. Then restart the ESC to complete the factory reset operation.