

## User Manual

Thank you for your purchasing this Brushless Electronic Speed Controller Combo (ESC). This electronic speed controller is specifically designed for operating brushless motors. High power systems for RC models can be very dangerous and we strongly suggest that you read this manual carefully. We have no control over the correct 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. Any claims arising from the operating, failure or malfunction etc. will be denied. We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship. **Please note ESC is not waterproof!**

### Features:

- Enhanced throttle response, excellent acceleration, strong brakes and throttle linearity.
- With the optional programming card you can make easy setup changes.
- Multiple protection features: Low voltage cut-off protection, over-heat protection, throttle signal loss protection and motor blocked protection
- Before using the new ESC, please carefully check if all connections are correct.

### Connected with Brushless motor

When using a Brushless motor, the Blue motor wire A, Yellow motor wire B and Orange motor wire C of the ESC can be connected with the motor wires freely. If the motor runs in the opposite direction, please swap any two wire connections.

### Connect the ESC signal wire to the Receiver

Black wire RX- Red wire RX+6.0V White wire RX-Signal

### ESC's indicating LEDs:

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 (95C)	Orange LED	Blinking
Sensorless motor	Orange LED	ON

### Throttle Range Calibration (For the first time using transmitter or changing the transmitter you must set Throttle Range Calibration)

- Switch off the ESC, then connect ESC with the battery pack and turn on the transmitter.
- Hold the "Set" button and switch on the ESC, wait for about 4 seconds until the Orange LED is on solid, then release the "Set" button.
- Push the set button once to confirm neutral settings.
- Hold full Throttle on the transmitter and push the set button once to confirm full throttle position.
- Hold full brake on the transmitter and push the set button once to confirm full brake positions.
- Turn off the ESC.
- Turn the ESC back on and your ESC is ready to use.

### Programmable items via programming card and default settings

Note: Default settings are shown in the grey boxes

Programmable Item	Programmable Value								
	1	2	3	4	5	6	7	8	9
Cut-off voltage	2.6/cell	2.8/cell	3.0/cell	3.2/cell	3.4/cell	No cut-off			
Running Mode	Forward w/o Reverse	Forward with pause then Reverse	Forward /Reverse						
Motor timing	Very low	low	normal	high	Very high				
Initial Acceleration	low	Medium	high	Very high					
Throttle Percent Reverse	20%	30%	40%	50%	60%	70%	80%	90%	100%
Throttle limit	0%	20%	30%	40%	50%	60%	70%	80%	100%
Percentage Braking	10%	20%	30%	40%	50%	60%	70%	80%	100%
Percentage drag Brake	0%	4%	8%	12%	15%	20%	25%	30%	
Motor Rotation	normal	reverse							
Neutral range	2%	3%	4%	5%	6%	10%			

## Sensored/Sensorless brushless ESC general information

### 1. Cutoff Voltage:

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. For LiPo you just set the threshold base on your battery. You can choose 2.6/2.8/3.0/3.2/3.4V Per cell. If you are using a NiMH or NiCd battery you can choose "no cut-off".

### 2. Running Mode:

**Forward w/o Reverse:** This is a Race setting-Reverse is disabled. You will find in racing, most tracks will not allow racing with reverse enabled.

**Forward with pause then Reverse (DEFAULT):** There is automatic protection within the ESC. Only after you have stopped and returned the trigger to neutral reverse will become available.

**Forward/Reverse:** If the option is activated, The car go forward when the throttle stick is located at the forward zone, when the throttle stick is located at the backward zone, the car will go backward, the brake will occur when direction change

### 3. Motor Timing:

This option affects the power band and efficiency (run time) of an electric motor. The default is "Normal" and is a good starting point to deliver power and provide good run time.

**Very Low:** Provides maximum efficiency with less power. Higher timing produces significantly more power but at the expense of efficiency (less run time) and typically the motor will generate more heat.

**Low:** Provides power for running through soft surfaces, having fun and longer run time.

**Normal (Default):** Good mix of power and efficiency using any motor High More power than efficiency so run time will reduce, and you should be monitoring motor heat. The higher KV or lower turn motors will generate heat quickly using this setting.

As a high temperature range is 165F to 180F (74° - 82° Celsius), going higher may damage your motor.

**Very high:** This is maximum power and must be used with caution. Note: Any motor has the potential to over-heat in this setting. Frequently check the motor temperature and make sure you're not operating higher than 165° and 180° Fahrenheit (74° - 82° Celsius), which may damage your motor, or damage your Electronic Speed Controller (ESC).

### 4. Initial Acceleration:

Use this to limit the initial power that is sent to the motor when starting from a complete stop. Using the low option, the vehicle will launch very slowly and provide the longest run times.

**High:** You will have wheel-spinning acceleration at the cost of run time.

**Low:** Using this option will provide longer run times. It is a good choice for beginners.

**Medium:** Requires more from your batteries, and is good for low traction surfaces.

**High (default):** This option will provide a big acceleration and requires stout batteries to supply the load required in this setting.

**Very high:** This option will provide full acceleration and requires stout batteries to supply the load required in this setting.

### 5. Throttle Percent Reverse:

Use this to limit the power available using reverse throttle. The lower the percent or level the less speed will be available in reverse. 20%,30 %,40%,50% ,60% ( Default), 70%,80%,90%,100%.

### 6. Throttle Limit:

Use this to limit the power available using forward throttle. The lower the percent the less forward throttle speed will be available. 0% (Default), 20%, 30%, 40%, 50% 60%, 70% , 80%, 90%.

### 7. Percentage Braking:

Gives you the ability to have full control over the amount of brake your vehicle will have.10%,20%,30%,40%, 50% (Default),60%,70%,80%,100%.

### 8. Percentage Drag Brake:

0% (Default) 4%,8%,12%,15%,20%,25%,30%.

The drag brake function provides the driver a set percentage of brake when you have the transmitter resting in neutral. This will create the "feel" of a brushed motor. Drag brake are used in racing to slow a vehicle as you let off approaching a corner versus the driver having to push the brake at every corner. If you are running on a high traction track with tight corners, a stronger setting should work best.

If you are running in an open area, you will find a smaller percentage will result in better control.

If you are running in dusty or slippery surfaces, you will more than likely want to use the lowest option.

### 9. Motor Rotation:

Normal (default), Reverse. Change this setting can change the rotation direction.

### 10. Neutral Range:

This setting adjusts the amount of "Deadband" off neutral on the throttle trigger. The smaller the value the less "Deadband".

Using a higher value for this setting will provide a wider "Deadband". 2%, 3%, 4% (Default), 5%, 6%, 10%.