

## 60A SENSORED/SENSORLESS BRUSHLESS SPEED CONTROLLER FOR CAR OR TRUCK

Thank you for your purchasing this Brushless Electronic Speed Controller (ESC). This electronic speed controller is specifically designed for operating Sensored/Sensorless brushless motors. High power systems for RC model 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 or 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. As far as is legally permitted, the obligation for compensation is limited to the invoice amount of product in question.

### Features:

Enhanced throttle response, excellent acceleration, strong brakes and throttle linearity

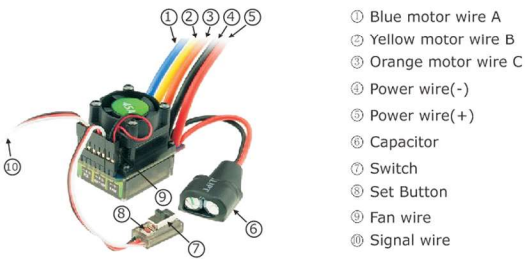
Several programmable options using either LED program card or Starlink USB link and PC application

Multiple protection features: Low-voltage cut-off protection, over-heat protection and signal loss protection

Compatible with sensored and sensorless brushless motors

### Begin to Use The New ESC:

Connect wires as indicated



### \*Sensored Mode

When using a Sensored Brushless motor, the Blue motor wire A, Yellow motor wire B and Orange motor wire C of the ESC must be connected with the Sensored motor wire A,B,C respectively. It is necessary to connect the Sensor wire to the "Sensor" socket on the ESC.

### \*Sensorless Mode

When using a Sensorless 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.

### \*Connection to the Receiver

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

### ESC Calibration

**\*ESC MUST be calibrated before initial use and any time a new radio/receiver is connected**

1. Switch off the ESC, then connect ESC to battery. Throttle and brake points MUST be set to their maximum setting on your radio, (usually listed as EPA/Travel etc. on radio and maximum value is from 100%-150%). Turn off ABS if so equipped.
2. Hold the "Set" button and switch on the ESC, both the red and orange LED's will be lit. Continue to hold the Set button until only the orange LED is lit. Release the Set button and immediately apply full throttle and hold it until red light turns solid and motor beeps.
3. Push the throttle trigger to Full Brake until the Orange LED blinks and then turns solid (motor will beep).
4. Now return the throttle trigger to the Neutral position, the red and orange LED's will flash, turn solid, then turn off and motor will beep. Calibration is complete.
5. Turn off the ESC power switch.
6. Turn the ESC back ON. You are ready to use the ESC now.
7. **NOTE:** On some radios the throttle channel must be set to REV for proper ESC function (Futaba, FlySky etc.)

### Programmable items and default settings:

Default settings are shown in the grey boxes

programmable Items	Programmable Value							
	1	2	3	4	5	6	7	8
Cut-off Voltage	2.6V/cell	2.8V/cell	3.0V/cell	3.2V/cell	3.4V/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%
Throttle Limit	0%	20%	30%	40%	50%	60%	70%	80%
Percentage Braking	10%	20%	30%	40%	50%	60%	70%	80%
Percentage Drag Brake	0%	4%	8%	12%	15%	20%	25%	30%
Motor Rotation	Normal	Reverse						
Neutral Range	2%	3%	4%	5%	6%	10%		

### Programming information:

#### LED Program Card:

It is important to follow the appropriate sequence when using the LED program card. If the sequence is not followed you will not be able to access programming functions.

With ESC switched off, plug the signal lead into the port on the right side of the card (3 symbols in front of it). The port on the left is for external power if ESC is not connected to a battery. Align the black wire with the "—" symbol. Turn ESC on, the menu function is shown on the left and the current setting on the right. Press "Menu" to scroll through functions, and press "Value" to change the selection. Press "OK" to save changes. When done making changes, switch off ESC and unplug card.

#### 1. Cut-off Voltage

This setting selects the battery voltage at which the ESC will cut off power to protect the battery. This is shown as volts per cell. The ESC auto-detects cell count, so selecting 3.0V/cell would cut battery power when pack voltage is at 6.0V. It is recommended to never discharge lithium batteries to less than 3.0V/cell. **NOTE: When using NiMH/NiCd batteries set to "No Cut-Off" or power may be cut prematurely.**

#### 2. Running Mode

##### • Forward w/o Reverse

Race setting. In this mode reverse is disabled.

##### • Forward with pause then Reverse: (DEFAULT)

Default mode for general driving, bashing and racing if reverse is allowed. The Electronic Speed Controller requires 2 seconds of continuous neutral from the transmitter prior to allowing reverse to operate.

*Note: There is automatic protection within the 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 / Reverse

Vehicle will go forward and backward, but no braking will be available.

##### • ESC – reverse operation

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.

**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. Each brushless motor will respond to timing differently. Good for running around on paved, or harder surfaces, and racing with high KV rated or low-turn motors

• **Low** Provides power for running through soft surfaces, bashing and longer run times

• **Normal (Default)** Good mix of power and efficiency using any motor

• **High** More power than efficiency & run time will be reduced. Motor temps **MUST** be monitored. The higher KV or lower turn motors will generate heat quickly using this setting. A safe 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. When using the HIGH choice, you will have wheel-spinning acceleration at the cost of run time. This is also very tough on the batteries as the amperage draw can be very high. If your vehicle cuts out, hesitates or loses radio control, you should consider setting this at a lower value.

• **Low** Using this option will provide longer run times and is easiest on the batteries. It is a good choice for beginners.

• **Medium** Medium requires more from your batteries, and is good for low traction surfaces.

• **High** This option will provide full 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.

Try working with this to get a sense of how you might use this for your track.

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

**10. Neutral Range** - This setting adjusts the amount of "Deadband" off neutral on the throttle trigger. This is in Milli-Seconds (MS) and is the amount of neutral when you pull the trigger.

The smaller the value the less "Deadband" or movement is required off-center for the ESC to begin throttle functions.

Using a higher value for this setting will provide a wider Deadband.

• 2% • 3% • 4% (Default) • 5% • 6% • 10%