



## BL Speed Control, 22-Amp (EFLA7320)

- Up to 22-Amp continuous current with proper air flow
- Dual BEC regulators for use with up to 4\*\* servos when using 3-Cell Li-Po packs
- Voltage cutoff set at 9V for 3 Cell Li-Po packs\*
- Automatically sets correct motor timing
- Includes pre-wired EC3 Devise and gold bullet connectors
- Includes pre-programmed brake

### Specifications:

Length: 46.5mm (1.8 in)

Width: 25.5mm (1 in)

Height: 9mm (.35 in)

Weight: 32 g (1.1 oz)

Cells: 3S Li-Po

Continuous Amps: 22

### Servo Ratings with BEC Enabled:

Cells:	High Torque Servos	Standard Servos	Sub-micro Servos
3 Li-Po	2	3	4**

\*\* When using economy class sub-micro servos, it is best to reduce the number of servos by one due to the higher average and peak current draw commonly associated with these servos. Using the servos included with the Plug-N-Play airplane will not have an issue. Always be sure to position the ESC for maximum airflow since cooling can significantly aid in the performance of the BEC.

Before first use, please refer to the above chart for BEC usage and cutoff voltage guidelines. You must follow these guidelines for safe operation. If you are using economy class servos with higher draw or more than four servos for a quad flap option, you will need to disable the BEC. If you wish to disable the BEC from the connector, you must first remove the red receiver wire and then insulate it properly to prevent shorting. When the BEC is disabled, you must use a four or five cell receiver pack to power your receiver and servos.

### PLEASE READ THESE INSTRUCTIONS IN THEIR ENTIRETY BEFORE USE

Before you connect your ESC and begin flying, take a moment to look it over. The input power side has a black and red wire along with an E-flite EC3 Male Device Connector. The motor side has three female gold bullet connectors.

The black and red wires with the EC3 Devise (DEV) Connector will connect to your power battery. The red wire connects to the red wire on your battery pack, the black wire to the black wire on your battery pack. If the wires are reversed, the ESC may be damaged. **YOU MUST ENSURE THAT YOU CONNECT THE BATTERY POLARITY PROPERLY TO PREVENT DAMAGE TO THE ESC.** Reversing polarity will void your warranty, so always double-check this connection. You will need to solder an E-flite EC3 Female Battery (BATT) Connector (EFLAEC302) to the battery so it matches this speed control. The throttle lead connects to the throttle channel on your radio receiver.

\*This controller is set with brake on and has a 9V cutoff designed for 3S Li-Po. You are not able to change this programming from the factory settings.

**WARNING: When checking the startup function of the ESC or making programming changes, please remove the propeller to prevent any potential injury.**

### Connecting the ESC to the Motor

The three wires from your motor connect to the three female gold bullet connectors on the ESC. The order of connection to the motor is not important; you can plug any motor wire into any connector. If, when you test the system, the motor runs backwards you have two options:

1. You can change the motor direction by following changing the programming using your transmitter. Instructions are below in the Programming section.
2. Physically unplug and switch any two of the motor wire plugs connected to the ESC. It is usually easiest to switch the outside wires.

### Starting Your Power System

1. Set the desired position of your throttle stick below the CENTER position on your transmitter and turn on your transmitter.
2. Connect the ESC to the battery. You will here two low/high tones indicating the system is armed. (If you are using the ESC with the BEC disabled, turn on the transmitter first, apply power to the receiver and servos, and then plug the power battery into the ESC.)
3. When you move the throttle stick upward, the motor will run. If you continue to move the throttle stick upward to FULL throttle (high position), the motor will run faster. If you lower the throttle stick below the start-up position, the motor will stop running.  
NOTE: If the start-up position of the motor is not satisfactory for you, you can reset the position by following the information in the programming section below.
4. Check servo motion as part of your preflight check. It is very important you make sure linkages are free-moving with no binding. When you are ready to fly, move the throttle stick back to your desired throttle position determined in Step 1. You are now ready to fly.

### Changing Programming for the Throttle Setting

1. With the transmitter on, set the throttle stick position to your desired setting.
2. Plug the battery into your ESC.
3. Move the throttle stick down to OFF throttle (lowest position). You will then here two low/high tones.
4. Immediately move the throttle stick back to your desired setting. You will then here two low/high tones

### Changing Programming for Motor Direction

NOTE: This can also be done by simply unplugging any two wires and switching and re-connecting.

1. Unplug the battery supplied to the ESC.
2. Move the throttle stick up to FULL throttle (highest point).
3. Connect the battery supplied to the ESC again.
4. Move the throttle stick down to OFF throttle (lowest point) position. You will then here one low/high tone.
5. Move the throttle stick up to FULL throttle (highest point). You will hear two low/high tones.
6. Next, move the throttle stick to the position you like. When you hear two low/high tones, then the direction should now be changed.

### Over-Current Protection

When the prop is locked or jammed and the motor stops running, the ESC will stop power to the motor immediately, so the motor can be protected from damage due to over-current.

### Low Voltage Warning Function

When the voltage of the battery drops below 9V, the ESC will reduce power (drop rpms) to the motor until the voltage is back above 9V. This will usually occur several times, but we suggest you land immediately before experiencing a significant loss of power while you have enough reserve power to land the plane.

### Limited Warranty Period

Horizon Hobby, Inc. guarantees this product to be free from defects in both material and workmanship for a period of 1 year from the date of purchase.

For specific information concerning the Limited Warranty, Limits of Liability, and Safety Precautions – please consult the airplane manual.

## BL450 890KV Outrunner Motor (EFLM7220)

### Specifications

Kv: 890 (rpm/v)

Io: 1.39A @ 8V (no load current)

Ri: .10 ohms (resistance)

Continuous Current: 14A

Max Burst Current: 20A

Cells: 6-10 Ni-MH/Ni-Cd or 2-3S Li-Po

Recommended Props: 9x6 to 11x3.8 'Slow Flyer' or 10x5 to 12x6 'Electric'

Brushless ESC: 20-22 Amp

Diameter: 28mm (1.1 in)

Case Length: 34mm (1.35 in)

Weight: 70g (2.5 oz)

Shaft Diameter: 4mm (.16 in)

\* Maximum Operating Temperature: 220 degrees Fahrenheit

\* Adequate cooling is required for all motor operation at maximum current levels.

\* Maximum Burst Current duration is 15 seconds. Adequate time between maximum burst intervals is required for proper cooling and to avoid overheating the motor.

\* Maximum Burst Current rating is for 3D and limited motor run flights. Lack of proper throttle management may result in damage to the motor since excessive use of burst current may overheat the motor.

### Operating Instructions

1. This brushless motor requires the use of a sensorless brushless speed control. Failure to use the correct speed control may result in damage to the motor and/or speed control.
2. When mounting the motor, be sure the correct length of screws are used so damage to the inside of the motor will not occur. We suggest you use the mounting hardware included with your motor. **The use of long screws will damage the motor.**
3. You may connect the three motor wires directly to the controller. The ESC has gold plated brushless bullet connectors (EFLA241) installed
4. If you add connectors and you no longer wish to use them, never cut the motor wires. Remove them by properly desoldering them. Shortening the motor wires is considered an improper modification of the motor and may cause the motor to fail.
5. When you connect the motor to the esc, check the rotation direction of the motor. If you find the rotation is reversed, switching any two motor wires will reverse the direction so the motor rotates properly.
6. Proper cooling of the motor is very important during operation. New technology has brought much higher capacity batteries with higher discharge rates, which can cause extreme motor temperatures during operation. It is the responsibility of the user to monitor the temperature and prevent overheating. Overheating of the motor is not covered under any warranty.
7. You can install the propeller on the motor shaft after you have confirmed proper rotation direction.
8. Once the battery is connected to the motor, please use extreme caution. Stay clear of the rotating propeller since spinning propellers are very dangerous as the motors produce high amounts of torque.
9. Never disassemble the motor. This will void any warranty.

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