



## Park 450 Brushless Outrunner Instructions

Thank you for purchasing the E-flite Park 450 Brushless Outrunner motor. This motor is an ideal choice for the E-flite Mini Ultra Stick, Mini Pulse XT, and small profile balsa 3D airplanes. The motor will provide great performance on the scale planes such as the E-flite Taylorcraft 450.

### **Park 450 Brushless Outrunner Features:**

- Ideal for 3D park flyers 15- to 25-ounces and scale park flyers 20- to 30-ounces using 2- to 3-cell 1200–2100mAh Li-Po packs
- High torque alternative to inrunner brushless motors
- Includes mount, prop adapters, and mounting hardware
- Quiet, lightweight operation – just 2.5 ounces (72 g)
- External rotor design, 4mm shaft can easily be reversed for alternative motor installations
- High quality construction with ball bearings and hardened steel shaft
- Slotted 12-pole outrunner design

### **Park 450 Specifications**

Diameter: 28mm (1.1 in)  
Case Length: 33mm (1.3 in)  
Weight: 72g (2.5 oz)  
Shaft Diameter: 4mm (.16 in)

### **EFLM1400**

Kv: 890 (rpms per volt)  
I<sub>o</sub>: .69A @ 8V (no load current)  
R<sub>i</sub>: .20 ohms (resistance)  
Continuous Current: 14A\*  
Max Burst Current: 18A\*  
Input Watts: 175  
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: 20A (EFLA311B) or 30A (EFLA1030)

\* 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.

### **Battery Choices:**

We recommend either E-flite or Thunder Power batteries and list some possible choices for the Park 450 Brushless Outrunner motor, all depending on the airplane application. Battery technology is constantly changing and manufacturers are improving and updating older packs with new ones so the list below may generally be substituted.

EFLB12502S	2S 1250mAh Li-Po,16AWG	THP13502SPL2	1350mAh 2-Cell 7.4V Pro-Lite V2 Li-Po
EFLB12503S	3S 1250mAh Li-Po,16AWG	THP13503SPL2	1350mAh 3-Cell 11.1V Pro-Lite V2 Li-Po
EFLB15002S	2S 1500mAh Li-Po,16AWG	THP21002SPL2	2100mAh 2-Cell 7.4V Pro-Lite V2 Li-Po
EFLB15003S	3S 1500mAh Li-Po,16AWG	THP21003SPL2	2100mAh 3-Cell 11.1V Pro-Lite V2 Li-Po
EFLB21002S	2S 2100mAh Li-Po,16AWG		
EFLB21003S	3S 2100mAh Li-Po,16AWG		

### **Examples of Airplane Setups:**

#### E-flite Mini Edge 3D ARF (EFL2225)

Comments – Sport 3D and aerobatic performance with good vertical power and top speed. Also allows the use of the lightweight THP13203SPL battery for improved power to weight ratio.

Weight w/Battery: 26 oz (735g)

Prop: 12x6 Electric (APC12060E) or 11x3.8 Slow Flyer (APC11038SF)

Battery: 1320mAh 3-Cell 11.1V LIPO (THP13203SPL) or 2100mAh 3-Cell 11.1V Li-Po (THP21003SPL)

ESC: 20A Brushless (EFLA311B)

### E-flite Mini Ultra Stick ARF (EFL2250)

Comments – Excellent aerobatic performance with good power and top speed.

Weight w/Battery: 24 oz (680g)

Prop: 10x8 Electric (EFLP1080E) or 10x7 Slow Flyer (EFLP1070)

Battery: 2100mAh 3-Cell 11.1V Li-Po (THP21003SPL)

ESC: 20A Brushless (EFLA311B)

### E-flite P-47D Thunderbolt 400 ARF (EFL6000)

Comments – Excellent scale and aerobatic performance with good power and top speed.

Weight w/Battery: 25 oz (710g)

Prop: 10x8 Electric (EFLP1080E)

Battery: 2100mAh 3-Cell 11.1V Li-Po (THP21003SPL)

ESC: 20A Brushless (EFLA311B)

### **Accessories:**

See our web site at [www.E-fliteRC.com](http://www.E-fliteRC.com) or [www.horizonhobby.com](http://www.horizonhobby.com) for our complete line of brushless motors. We have posted a specification comparison sheet on our web site so you can compare the different motors we offer.

EFLA110	Power Meter (measures power output in amps, volts, watts, and capacity)
EFLA311B	20-Amp Brushless ESC (V2)
EFLA1030	30-Amp Pro SB BEC Brushless ESC
EFLA241	Gold Bullet Connector Set, 3.5mm (3)
EFLM1924	Prop Adapter w/ Collet, 4mm

### **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. **Please be sure the timing and PWM switching frequency is set properly on your controller.**
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 with solder or use connectors such as gold plated brushless bullet connectors (EFLA241), which will also need to be soldered properly to your wires. The three motor wires can be connected in any order to the three output wires or output port on a sensorless brushless speed control. Be sure to use heat shrink tubing to properly insulate the wires so the wires will not short. Shorting may damage the motor and speed control.
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. Also consult the instruction included with your sensorless electronic speed control for proper adjustments and timing.
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.

### **Reversing Shaft Installation**

This Outrunner motor has a shaft, which exits through the rotating part of the motor. If you want to reverse the shaft to exit through the fixed part of the motor, follow these instructions carefully for changing the shaft installation. **NOTE:** The user assumes all liability for damage that may occur.

1. Loosen the set screw on the shaft collar and remove the collar from its location against the bearing.
2. Remove the small black donut washer that rests against the bearing.
3. Loosen the set screw in the rotating part of the motor.
4. Slide the shaft through the motor. It may be necessary to use a small hammer to lightly tap the shaft. It is very important that you do not bend the shaft in this process so use extreme caution to assure this does not happen.
5. Re-install the donut washer against the bearing.
6. Re-install the shaft collar back against the washer and bearing.
7. Retighten all setscrews making sure you line up with the flat spot on the shaft.

Replacement shafts are available separately. Order EFLM1401 for a Park 450 BL Outrunner shaft.

**Safety Precautions:**

This is a sophisticated hobby product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. **This product is not intended for use by children without direct adult supervision. The Outrunner motor case is a rotating part so use extreme caution.** Please read the warning information included with your propellers for safety information related to the operation of motors with propellers. Failure to comply with these warnings and/or improper use of propellers may result in serious injury.

**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.

**Limited Warranty**

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

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**Damage Limits:**

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

**Safety Precautions:**

This is a sophisticated hobby Product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the Product or other property. This Product is not intended for use by children without direct adult supervision. The Product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

**Questions, Assistance, and Repairs:**

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com), or call 877.504.0233 toll free to speak to a service technician.

**Inspection or Repairs**

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for

lost or damaged parcels, as **Horizon is not responsible for merchandise until it arrives and is accepted at our facility.** A Service Repair Request is available at [www.horizonhobby.com](http://www.horizonhobby.com) on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

### **Warranty Inspection and Repairs**

**To receive warranty service, you must include your original sales receipt** verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

### **Non-Warranty Repairs**

**Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost.** By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. **Please note: non-warranty repair is only available on electronics and model engines.**

**Items requiring inspection or repair should be shipped to the following address (freight prepaid):**

**Horizon Service Center  
4105 Fieldstone Road  
Champaign, Illinois 61822**

***Please call 877-504-0233, or e-mail us at [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com) with any questions or concerns regarding this product or warranty.***

**United Kingdom:  
Horizon Hobby UK  
Units 1-4 Ployters Rd  
Staple Tye  
Harlow, Essex CM18 7NS  
United Kingdom**

***Please call +44 (0) 1279 641 097 or email us at [sales@horizonhobby.co.uk](mailto:sales@horizonhobby.co.uk) with any questions or concerns regarding this product or warranty.***

**Germany:  
Horizon Technischer Service  
Hamburger Strasse 10  
25335 Elmshorn  
GERMANY**

***Please call +49 4121 46199 66 or email us at [service@horizonhobby.de](mailto:service@horizonhobby.de) with any questions or concerns regarding this product or warranty.***

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Instructions for Disposal of WEEE by Users in the European Union This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to as designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

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