



## Park 480 Brushless Outrunner Motor, 1020 Kv Instructions

Thank you for purchasing the E-flite Park 480 Brushless Outrunner Motor, 1020 Kv. The Park 480 Brushless Outrunner motor is designed to deliver clean and quiet power for 3D park flyers 20- to 30-ounces (565- to 850-grams), scale park flyers 25- to 35-ounces (710- to 990-grams), or models requiring up to 275 watts of power. It's an especially good match for E-flite's Mini Edge 3D ARF (EFL2225) and Mini Funtana 3D ARF (EFL2075), and would provide extreme power for sport park flyers such as the Mini Ultra Stick ARF (EFL2250).

### **Park 480 Brushless Outrunner Features:**

- Perfect match for 3D park flyers 20- to 30-ounces (565- to 850-grams)
- Ideal for scale park flyers 25- to 35-ounces (710- to 990-grams)
- Ideal for models requiring up to 275 watts of power
- High Torque, direct drive alternative to inrunner brushless motors
- Includes mount, prop adapters, and mounting hardware
- Quiet, lightweight operation
- 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 480 Specifications**

Diameter: 35mm (1.4 in)  
Case Length: 33mm (1.3 in)  
Weight: 87g (3.1 oz)  
Shaft Diameter: 4mm (.16 in)

### **EFLM1505**

Kv: 1020 (rpms per volt)  
Io: 1.1A @ 8V (no load current)  
Ri: 60 mohms (resistance)  
Continuous Current: 22A\*  
Max Burst Current: 28A\*  
Watts: up to 275  
Cells: 6-10 Ni-MH/Ni-Cd or 2-3S Li-Po  
Recommended Props: 10x7 to 12x6 'Electric'  
Brushless ESC: 25A - 40A (EFLA312B)

- \* 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.

### **Determine a Model's Power Requirements:**

1. Power can be measured in watts. For example: 1 horsepower = 746 watts
2. You determine watts by multiplying 'volts' times 'amps'. Example: 10 volts x 10 amps = 100 watts

#### **Volts x Amps = Watts**

3. You can determine the power requirements of a model based on the 'Input Watts Per Pound' guidelines found below, using the flying weight of the model (with battery):

- 50-70 watts per pound; Minimum level of power for decent performance, good for lightly loaded slow flyer and park flyer models
- 70-90 watts per pound; Trainer and slow flying scale models
- 90-110 watts per pound; Sport aerobatic and fast flying scale models
- 110-130 watts per pound; Advanced aerobatic and high-speed models
- 130-150 watts per pound; Lightly loaded 3D models and ducted fans
- 150-200+ watts per pound; Unlimited performance 3D models

NOTE: These guidelines were developed based upon the typical parameters of our E-flite motors. These guidelines may vary depending on other motors and factors such as efficiency and prop size.

4. Determine the Input Watts per Pound required to achieve the desired level of performance:

Model: E-flite Mini Edge 3D ARF  
Estimated Flying Weight w/Battery: 1.6 lbs  
Desired Level of Performance: 150-200+ watts per pound; Unlimited performance 3D models

**1.6 lbs x 150 watts per pound = 240 Input Watts of total power (minimum)  
required to achieve the desired performance**

5. Determine a suitable motor based on the model's power requirements. The tips below can help you determine the power capabilities of a particular motor and if it can provide the power your model requires for the desired level of performance:

- Most manufacturers will rate their motors for a range of cell counts, continuous current and maximum burst current.
- In most cases, the input power a motor is capable of handling can be determined by:

**Average Voltage (depending on cell count) x Continuous Current = Continuous Input Watts**

**Average Voltage (depending on cell count) x Max Burst Current = Burst Input Watts**

HINT: The typical average voltage under load of a Ni-Cd/Ni-MH cell is 1.0 volt. The typical average voltage under load of a Li-Po cell is 3.3 volts. This means the typical average voltage under load of a 10 cell Ni-MH pack is approximately 10 volts and a 3 cell Li-Po pack is approximately 9.9 volts. Due to variations in the performance of a given battery, the average voltage under load may be higher or lower. These however are good starting points for initial calculations.

Model: E-flite Mini Edge 3D  
 Estimated Flying Weight w/Battery: 1.6 lbs  
 Input Watts Per Pound Required for Desired Performance: 150 (minimum)

Motor: Park 480 Brushless Outrunner, 1020Kv  
 Max Continuous Current: 22A\*  
 Max Burst Current: 28A\*  
 Max Cells (Li-Po): 3

**3 Cells, Continuous Power Capability: 9.9 Volts (3 x 3.3) x 22 Amps = 218 Watts**  
**3 Cells, Max Burst Power Capability: 9.9 Volts (3 x 3.3) x 28 Amps = 277 Watts**

Per this example, the Park 480 Brushless Outrunner, 1020 Kv motor (when using a 3S Li-Po pack) can handle up to 277 watts of input power, readily capable of powering the Mini Edge 3D with the desired level of performance (requiring 150 watts minimum). You must however be sure that the battery chosen for power can adequately supply the current requirements of the system for the required performance.

### Battery Choices:

There are many Li-Po battery brands on the market with several choices for consumers. We recommend either E-flite or Thunder Power batteries and list some possible choices for the Park 480 Brushless Outrunner motor, all depending on the airplane application. NOTE: Battery technology is constantly changing and improvement are made often. Some part numbers below may change as improved versions are introduced.

EFLB1021	7.4V 1800mAh 2-Cell LIPO,16GA	THP19002S	1900mAh 2 cell 7.4V LIPO,16GA
EFLB1025	11.1V 1800mAh 3-Cell LIPO,16GA	THP19003S	1900mAh 3-Cell 11.1V LIPO,16GA
EFLB1031	7.4V 2100mAh 2-Cell LIPO,16GA	THP20002SPL	2000mAh 2-Cell 7.4V LIPO,16GA
EFLB1035	11.1V 2100mAh 3-Cell LIPO,16GA	THP20003SPL	2000mAh 3-Cell 11.1V LIPO,16GA
		THP21002SPL	2100mAh 2-Cell 7.4V LIPO,16GA
		THP21003SPL	2100mAh 3-Cell 11.1V LIPO,16GA

Note: If using larger propeller sizes with 3S Li-Po, due to high power output and current demands of this motor, we recommend the use of packs capable of delivering a minimum of 30A continuous current. Good examples of these packs would be the Thunder Power PRO LITE 2100 mAh 3S packs (THP21003SPL). We do not recommend the use of packs that cannot deliver at least 30A continuous current like the Thunder Power Generation II 2100 mAh 3S packs (THP21003S) unless using smaller diameter and lower pitch propellers.

### Examples of Airplane Setups:

Please see our web site for the most up-to-date information and airplane setup examples.

NOTE: All data measured at full throttle. Actual performance may vary depending on battery and flight conditions.

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

#### Option 1:

Motor: Park 480 Brushless Outrunner, 1020Kv  
 ESC: E-flite 40A Brushless ESC (EFLA312A)  
 Prop: APC 12 x 6E (APC12060E)  
 Battery: Thunder Power PRO LITE 2100mAh 3S (THP21003SPL)  
 Flying Weight w/Battery: 26 oz (1.6 lbs)

<b>Amps</b>	<b>Volts</b>	<b>Watts</b>	<b>Input Watts/Pound</b>	<b>RPM</b>
26.2	10.4	272	167	7320

Expect extreme awesome power and performance with good speed and strong vertical performance and pull out from hover. Using a 12x6 prop will provide better thrust with slightly less speed than if you used an 11x7 propeller. This motor is more suitable for higher output batteries such as the Thunder Power PRO LITE packs. Average duration is approximately 8-12 minutes depending on throttle management.

#### Option 2:

Motor: Park 480 Brushless Outrunner, 1020Kv  
 ESC: E-flite 40A Brushless ESC (EFLA312A)  
 Prop: APC 11 x 7E (APC11070E)  
 Battery: Thunder Power PRO LITE 2100mAh 3S (THP21003SPL)  
 Flying Weight w/Battery: 26 oz (1.6 lbs)

<b>Amps</b>	<b>Volts</b>	<b>Watts</b>	<b>Input Watts/Pound</b>	<b>RPM</b>
26.1	10.4	271	169	7380

Expect extreme awesome power and performance with higher speeds compared to using a 12x6 propeller. There is plenty of thrust for hovering and good vertical performance. Punch outs are not a problem and this setup has an exceptionally quiet and smooth sounding flight. Average duration is approximately 8-12 minutes depending on throttle management.

### 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)
EFLA312B	40-Amp Brushless ESC (V2)
EFLM1915	Outrunner Stick Mount
EFLM1916	Firewall Stick Mount
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.
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.

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 only 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 after applying a small drop of blue thread lock to the set screws. Make sure you line up with the flat spot on the shaft.

Replacement shafts are available separately. Order EFLM1501 for a Park 480 BL Outrunner shaft.

### Installation:



**NOTE:** Photo shows typical installation of motor and x-mount directly to the outside of the firewall. There are other options available including mounting the motor inside the fuselage (requires reversing the shaft direction) or extending the motor further forward using aftermarket mount extensions when using cowls.

1. You can first trial fit the aluminum x-mount against the front of the firewall and use a Sharpie® to mark the locations of four holes and drill appropriate size hole to fit the blind nuts provided. Always be sure to maintain the proper thrust line and account for adequate prop/spinner clearance.
2. Attach aluminum x-mount to the outrunner motor using the four flat head (countersunk) screws provided with the motor.
3. Install four blind nuts on the inside of the firewall.
4. Attached the aluminum x-mount and motor to the outside of the firewall using the four 3mm socket head cap screws and washers.



**NOTE:** Photo shows typical installation of our Park 480 Brushless Outrunner motor using an E-flite Outrunner Stick Mount (EFLM1915). By this method you can mount directly to an existing motor stick or to our Firewall Stick Mount (EFLM1916).

1. It will be necessary to use the four extension pieces and the longer 3mm screws included with the mount.
2. Trial fit the motor and Outrunner Stick Mount on the motor stick before attaching to make sure you have proper clearance if a cowl is installed. It may be necessary to reduce the length of the motor stick first.
3. Attach aluminum Outrunner Stick Mount with motor attached to the motor stick using the screw included with the mount.

#### **Warranty and Repair Policy:**

The Park 480 Brushless Outrunner Motor is guaranteed to be free from original manufacturing defects in material and workmanship at the date of purchase. No term warranty applies to this product. This warranty does not cover any component parts damaged by use, misuse, unauthorized service or any form of modification. Horizon Hobby assumes no liability for damages caused during the installation of this motor. At no time will Horizon Hobby be responsible for collateral or incidental damages caused during the operation of this motor. We reserve the right to change or modify this warranty at any time.

**To speak to a service technician, call (877) 504-0233.**

#### **Warranty Repairs:**

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Providing that warranty conditions have been met, your motor will be repaired free of charge.

#### **Non-Warranty Repairs:**

Should your repair cost exceed 50% of the retail purchase cost, you will be provided with an estimate advising you of your options. Any return freight for non-warranty repairs will be billed to the customer. For non-warranty repairs, please advise us of the credit card that you prefer to use. Horizon Service Center accepts Visa or MasterCard. Include your card number and the expiration date. Horizon Service Center also accepts money orders.

If your motor needs to be repaired, ship the motor in its original box (freight prepaid) to:

Horizon Service Center  
Attn: E-flite™ Service Center  
4105 Fieldstone Rd.  
Champaign, IL 61822

Include your complete name and address information inside the carton, as well as clearly writing it on the outer label/return address area. Include a brief summary of the difficulty. Date your correspondence and be sure that your name and address appear on this enclosure. Also, please include a phone number where you can be reached during the business day.

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