

# INSTRUCTION MANUAL

## PHOTON

PHOTON SENSORLESS BRUSHLESS SYSTEM

### INTRODUCTION

Leopard 60A ESC is high performance 1:10 Scale Brushless Motor Electronic Speed Control. The speed controller is specially designed to offer high power and high efficiency combined with low weight and compact dimensions.

- Automatic cut-off
- Auto neutral setting
- Auto cell system
- Advanced software
- Over temperature protection
- Fail safe mode

Please read the following instructions to ensure, that your Leopard 60A ESC brushless speed control always works up to your full satisfaction.  
Please read and understand these instructions completely before you use this product!

### SAFETY PRECAUTIONS

The following statements need to be understood before using the Leopard 60A ESC:

- The Leopard 60A ESC is intended for 1:10 scale or smaller car.
- KV value <4500KV for touring car and <4000KV for buggy car.
- Do not operate speed control in or around water
- Do not reverse the battery wire connections! Reversing the battery polarity will permanently damage the ESC
- Disconnect battery from speed control when not in use.
- Insulate exposed wire with heat shrink tubing to avoid shorts.

### QUICK START GUIDE

1. Mount the ESC and motor into the car
2. Plug in the 3 motor wires to the 3 motor wires on the ESC
3. Plug in the ESC Rx lead to CH2 on your receiver.
4. Make sure the ESC's switch is off.
5. Plug in a battery.
6. Switch on transmitter and then turn on ESC, you'll hear multiple tones and after a few seconds you will hear another confirmation multiple tones and the ESC is ready to go.

### SPECIFICATION

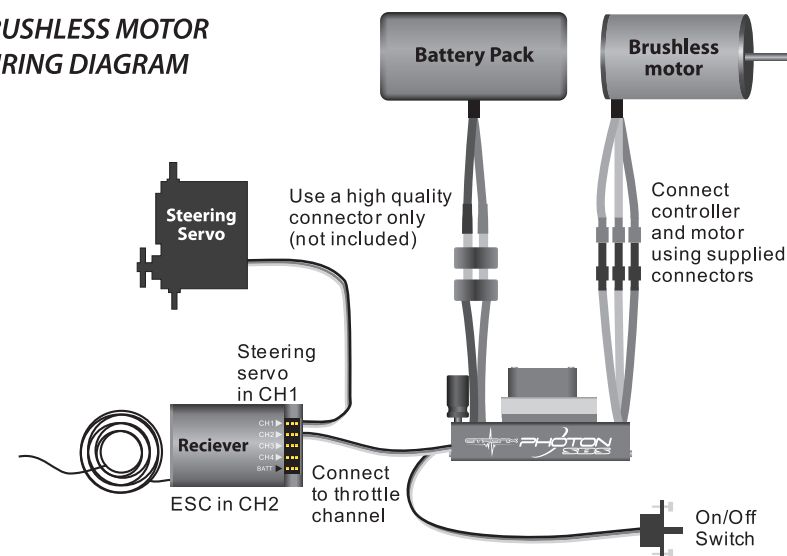
Input: NiMH 6 cells & LiPo 2-3 cells & LiFe 2-3 cells  
Output: Max 360 Watt, 54A at 25°C, 45A at 75°C, Peak 240A  
Motor Support: KV<4500KV, 1:10 Scale Car  
BEC: 5V, 2A  
Net Weight: 72g  
Dimension: 48x33x29mm



### INSTALLATION & CONNECTION

Install the ESC according to the diagram shown below.

#### BRUSHLESS MOTOR WIRING DIAGRAM



Switch on the transmitter. Lift the car with the 4 wheels un-touching and turn on the ESC power. Right after turn on the power of the ESC, you will hear a multiple sound indicating the ESC is starting work and auto-setting the throttle neutral. When succeed in setting neutral, it will then denoted by another confirmation sound. If it is failed setting neutral, there will be no any confirmation sound. This ESC is applicable to the transmitter with the setting of 50% throttle 50% brake/reverse or 70%:30%.

Adjust & make sure the Throttle forward direction coincides with the ESC forward direction. Assure the car with 4 wheels lifted un-touching. Push the throttle trigger forwards to start motor running, pull the throttle trigger backwards & hold it. If the system keeps braking, the throttle forward direction coincides with the ESC forward direction. Otherwise, if the system only has a brief braking then driving reversely, the throttle and ESC forward directions do not coincide with each other. Change the throttle reversing switch of the transmitter, release the throttle switch, turn off & then turn on the ESC power again. After auto set neutral & push the throttle trigger forwards the car should also drive forward & the non-coincidence is corrected. If not, changing any two of the motor wires will correct the non-coincidence problem.

Motor rotating direction - Slowly apply throttle to check if the motor is rotating in the correct direction you desired.

You may need to swap the any two motor wires to get the wheels to spin in right directions

## INITIAL RUNNING

Firstly trial running by starting with a small gear motor for 2~3 minutes, measure the temperatures of both ESC & Motor. If both temperatures are close with each other, they are at good match. The gear ratio can then be properly adjusted to optimum according to the features of the courses. However, It's very important to always keep both temperatures under 100°C, while adjusting the gear ratio. Otherwise the demagnetization of the motor will happen, the motor efficiency will drop dramatically & the temperature will be raised up very quickly. Most battery energy is now wasted on heat, nothing on motor efficiency.

It's acceptable to replace a higher gear ratio or a higher KV motor while the temperature of the ESC is under 80°C. Unless the KV value of the original motor is very low enough. It should replace a motor with lower KV value when the input battery voltage is changed to a higher level. The ESC will be burnt if the motor doesn't be properly changed while input voltage is changed.

## SETTINGS & EXPLANATIONS

Learn and 60A ESC is extremely flexible and may be “tuned” like any other part of your car. The following section explains all the settings available to you via a Program Card

### REVERSE (DRIVING BACKWARD)

Setting 1: Off Turn off reverse function.

Setting 2: Lo Allow only 30% power in reverse.

Setting 3: Mi Allow only 60% power in reverse.

Setting 4: Hi Allow 100% power in reverse.

### START POWER

Setting 1: Std Normal acceleration.

Setting 2: Lo Low acceleration.

Setting 3: Mi Middle acceleration.

Setting 4: Hi High acceleration.

### DRAIN BRAKE

Setting 1: Off Car will coast with almost no resistance from the motor at neutral throttle.

Setting 2: Lo Low amount of braking effect from the motor at neutral throttle.

Setting 3: Mi Middle amount of braking effect from the motor at neutral throttle.

Setting 4: Hi High braking effect from the motor at neutral throttle.

### BATTERY TYPE

Setting 1: NiMH

Setting 2: NiCd/LiFe 2 Cells

Setting 3: LiPo 2 Cells / LiFe 3 Cells (6V)

Setting 4: LiPo 3 Cells (9V)



Please follow correct battery types setting strictly. Wrong cut-off voltage setting will irreversibly damage your Lithium Polymer Packs.



SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

