



ALIEN POWER SYSTEM



High voltage

## Thank you for buying an Alien Power System (APS) product.

Please follow the instructions to program your controller. Incorrect handling may cause damage to the controller and cause injury to yourself and others. It is highly recommended to read this manual carefully and follow the programming instructions before first use of the device. APS is not responsible for the incorrect use of the product and any damage caused while using the device. APS assumes no responsibility for any damage or injury due to improper use or modification of any of the products. APS has the right to change the design, features, functions and requirements for the operation of its products without prior notice. Your item is fully guaranteed for 1 year, this excludes products that have been modified or incorrect use of the product.

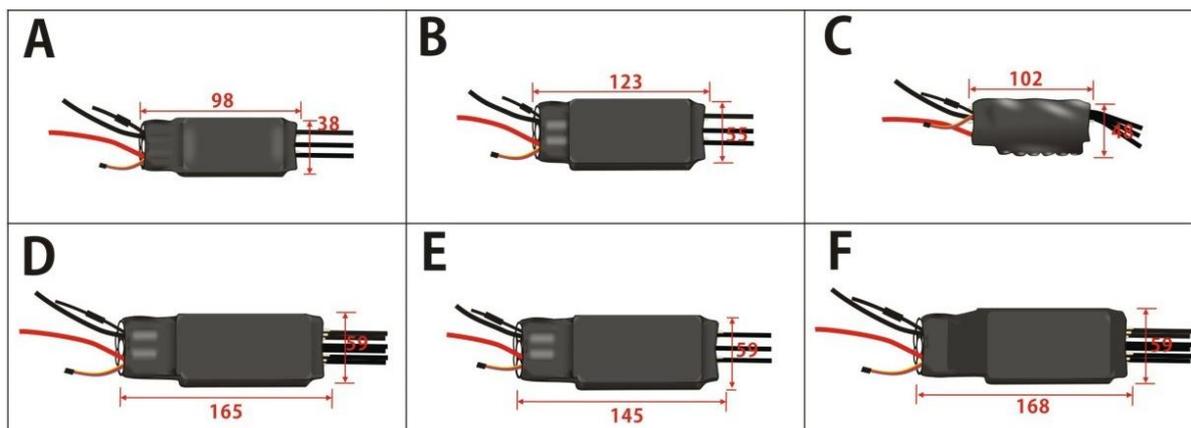
**NOTE:** This ESC is not plug and play. The device needs to be correctly programmed to avoid any issues.

### WARNING:

**DO NOT ATTEMPT TO OPERATE THE ESC WITH JUST THE ANTI-SPARK WIRE. IT WILL RESULT IN PERMENENT ESC DAMAGE.**

### Product Features:

- Battery voltage from 3S to 24S
- Easy set function value by Pro-Box or by PC via USB link provided
- Two-way communication while connecting it to computer
- Firmware can be updated by USER
- LVC
- Timing settings adjustable (0° - 30°) degree to suit the motor type
- 3 types of throttle curve
- 3 types of acceleration control
- Motor rotation programmable
- Auto cut off power within 3 seconds in the case of signal loss.



## **FUNCTION VALUE:**

### **BATTERY**

Type: Ni-XX、 Li-XX

Cell count: Auto or manual

LVC mode: Slow cut off/Hard cut off

### **THROTTLE**

Throttle acceleration: Extra soft/Soft/Medium/Hard/Extra hard

Throttle Curve: Logarithmica, linear, exponential

Forwad/ Revertse Points: Auto or manual

Set Ini/End Points: Auto or manual

### **MOTOR**

Motor Timing Degrees: (0% - °30%)

PWM: 8 - 16 – 32

Timing monitor: ON/OFF

Motor check: ON-OFF

Motor Rotation Direction: Clockwise/Anticlockwise

### **BRAKE**

ABS Braking (car only): off -100%

PROP Braking (airplane-heli only): off -100%

Delay Time: 0.25 - 5 seconds (car and Boat only)

### **POWER**

PWM Limit (Car/Boat): ON/OFF (%)

Reverse (car/Boat): ON/OFF

Start Power: Auto – 100%

### **HELICOPTER**

Mode -HELL: Contant RPM/Normal RPM

Motor Pole set up: 2-4, 6-10, 12-14 (heli only)

## **Function value setting by transmitter:**

This series of ESC can be set simply by transmitter, but more function value settings can only be done via Program Box or PC via USB link. After connecting with ESC motor, receiver and battery, you can set the function value

This series ESC can be set with some simple function value by transmitter, but the more function value setting must be by prog-box or PC via USB link wire.

This ESC has two different types of mode, one is Brake ON mode, and another is Brake Off mode. Change mode setting procedure as follows:

1. Move throttle stick on full power position, turn on transmitter. Now when switching on the ESC, programming sequence will start.
2. Connect the power battery, turn on receiver.
3. After approx. 5 seconds, a four-tone melody can be heard; this indicates that a programming sequence is ready.
4. You will hear 5 groups of beeps “♪ (a short beep)”, then 5 groups of 2 beeps “♪♪”, then 5 groups of 3 beeps “♪♪♪”; then 5 groups of 4 beeps “♪♪♪♪”; and 5 groups of 5 “♪”, Each group of 5 sounds stands for a different mode of ESC
5. You can put the throttle stick to the middle position during one group of 5 sounds, and then the

corresponding mode is saved.

6. Hear 1“♪”(Forward mode) or “♪♪”(Forward/Reverse mode), then you can exit the setting mode after saving the mode.

(When the mode is saved, you can disconnect the ESC to the battery pack)

◎ Brake On mode and Brake Off mode:

Hear the first “♪♪♪♪”, put the throttle stick to the middle position, the mode is changed from Brake ON mode into Brake off mode. If you want to change back, please repeat the above procedures, and vice versa.

◎ Timing (motor ignition advance) function value:

1. Hear 5 groups “” or “♪” or “♪♪” or “♪♪♪” in the above circulation, put the throttle stick to the middle position.

2. Timing mode 1: 5 groups “♪”----0~7° (recommended for 2 poles and common motors)

3. Timing mode 2: 5 groups “♪♪”----8~15° (recommended for 4 poles motors)

4. Timing mode 3: 5 groups “♪♪♪”----16~23° (recommended for 8 poles motors)

5. Timing mode 4: 5 groups “♪♪♪♪”----24~30° (recommended for more than 10 poles motors and out runner motors)

◎ Setting of Frequency:

1. Hear 5 groups “♪-” or 5“♪-♪-” or 5“♪-♪-♪-” in the above circulation, put the throttle stick to the middle position.

2. Frequency 1: 5 groups “♪-”----8 kHz ((For common setting, the lowest efficiency loses)

3. Frequency 2: 5 groups “♪-♪-”----16 kHz (recommended for the low internal resistance of motor)

4. Frequency 3: 5 groups “♪-♪-♪-”----32 kHz (recommended for the low electrical inductance of motor)

Note: when the timing of motor is saved, please adjust motor on the ground before the flight

### Function value setting by program box:

You can set all of function value very simply. Setting procedure as follows:

1. Put the JR pin of the ESC Plug the 4PIN connector of the Prog-Box.

2. Connect ESC and motor, check illustration below.

3. Turn on the ESC, and you will hear a beep prompt the connecting is ok and you can go on.

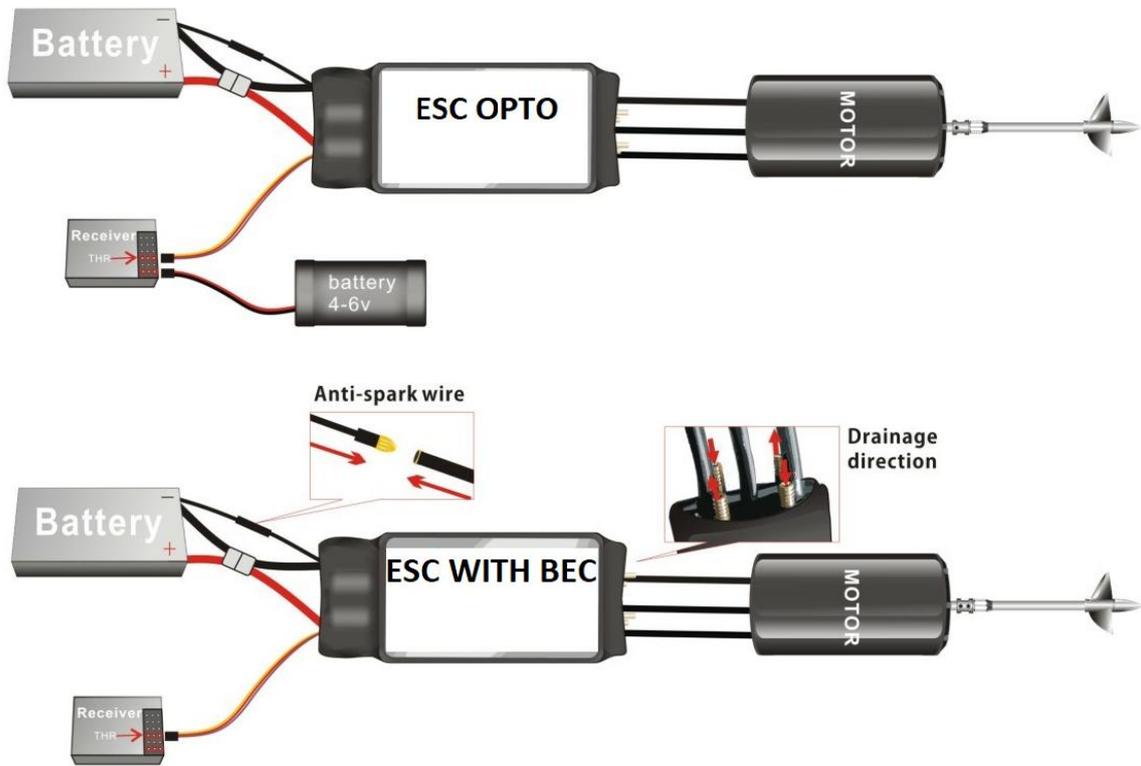
4. Prog-Box display the APS name first, after 5 seconds or pressing any button it will enter the first function-MODE TYPE setting interface.

5. Press← or →button to select the ESC type which you bought from Airplane, Helicopter, Boat, Car, then press “Forward” button to enter into the second function item-CONTROLLER TYPE. Now press ← or → button to select the type number of ESC, if your select is right, the motor will beep, prompt the type number is right.

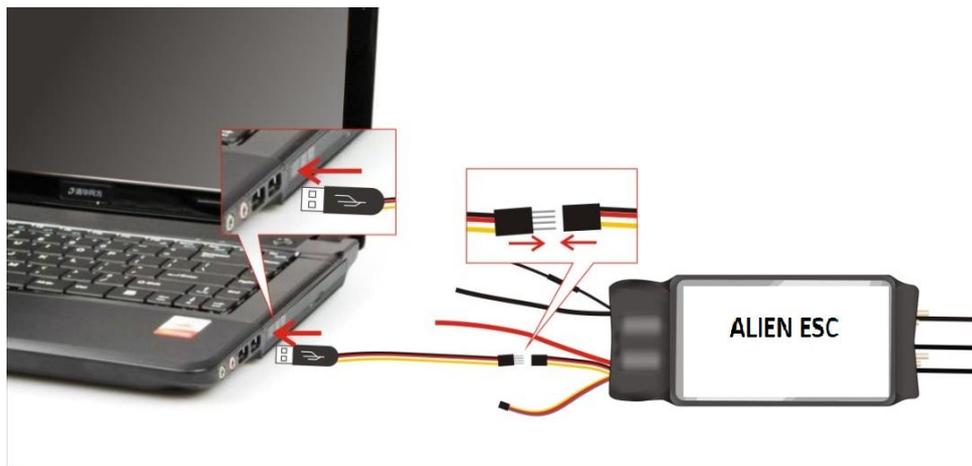
6. From now on, you can press Back and Forward button enter into desired function item, then press ← or → button enter into desired value. The motor will beep once press a button , prompt the setting value have sent to the ESC.

7. After setting over, turn off the ESC, disconnect the Prog-Box. The last function value will be record in the Prog-Box, the next setting can use it again.

**Note:** If the ESC you are setting is without BEC, you will have to power the Prog-Box



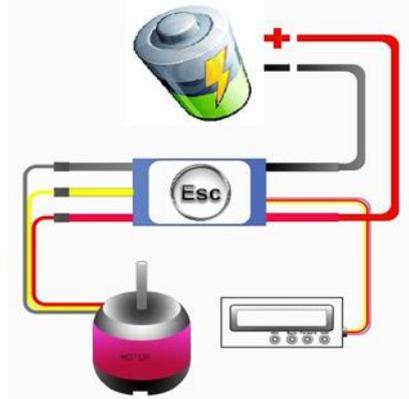
The installation of the ESC Computer program Software is as the same as a normal windows software. In windows system, you simply run the setup file, and then install it according to the prompt. After installation has finished, you can run the software. The APS SETUP program software can be downloaded from our website. Download page. Please NOTE: The file is a zip file so it needs to be decompressed



### How to program the ESC by PC software

1. This is very important. Disconnect the battery, the motor and the receiver. The ESC needs to be connected on its own to the PC
2. Plug the USB link to your PC (please note that the USB driver is needed for the USB to work. Windoes XP and 7 need the prolific driver to be installed. Win 8, 10 and new will automatically install the driver once the USB link is plugged in your PC)
3. Launch the APS ESC Computer Link Software.
4. Now select the right COM port and plug your ESC to your PC. Make sure the 4 ESC pin colour match the USB pin colour. Wrong connection can damage the ESC. If you connect correctly, the ESC type will display in the ESC type window. If it doesn't display correctly, you can pull the 4pin wires and plug again,

- till the display is correct.
5. You can now change any setting value from the program area; you also can press the “load factory default” text to load the factory default value.
  6. After you finish your adjustment press the top-right “write” button, your setting value will be saved into the ESC.
  7. Disconnect the 4pin wires (the 4 metal pin have to stay on the USB cable and not on the ESC program cable. When the esc work that cable is powered and if the pin touch a metal part or they touch each other the esc logic board can be damaged).
  8. Exit the ESC computer software.



\* Please note: An EV system is not an RC system. The RC system works to the max power for a few minutes with a relative small load. EV mean that you ride on the road with a big load for a long time. APS controllers have been tested on EV with very good results. For EV applications please contact us for more info and suggestions. You need to consider different mechanical and electronic aspects. Some of the fastest EV on the market and DIY are powered by RC products ( Battery, motors, controller) because they are the ultimate in light weight, efficiency and performance. Small and powerful batteries, motors and controllers.

NOTE: We recommend using a lower LiPo battery input when programming for the first time the ESC in order to practice. This is a precaution to familiarise yourself with the products you are using and to prevent problems and damage. Do a first no load test to check that everything works fine. Then start to try the full power of your APS ESC.

Once you are familiar with programming using the program box, it will take about 15 seconds or so to program the controller once it is connected.

I hope everything is satisfactory, if not, please let us know prior to rating/voting and we will assure you we will find a solution as soon as possible.

For any questions and requests please feel free to contact us.

**ALIEN POWER SYSTEM - PRECISION ELECTRONIC EQUIPMENT**

## ALIEN POWER SYSTEM SENSORED ESC.

A NEW VERSION OF APS ESC IS THE SPORT 2 SENSORED MODEL.

Brushless ESC basically drive tri-phase Brushless motors by sending a sequence of signals for rotation. The correct phase varies with the motor rotation, which is to be taken into account by the ESC. Some of them (Sensorless) use back EMF (electromotive force) created by the motor to give current to two phases and start the motion. The back EMF is directly proportional to the motor speed so this makes it difficult for the ESC to detect the rotor position when stationary or at low speed. The result in most cases is a lower torque on the startup, more noise at low rpm and poor low-speed driveability. Also at high speed with a fast change of rpm the ESC can lose sync and it's possible to damage the ESC itself.

Other controllers use magnetic sensors (in sensored controllers) or optical detectors.

In the Sensored controllers, what the sensor does is communicate to the ESC the exact position of the rotor. The ESC uses this info to start the rotor spinning perfectly without having to 'guess', so it can precisely send voltage and energise the exact coils at the exact time when they need to be energised. This results in a smoother power, better low-speed driveability and more torque particularly noticeable in lower rpm.

This ESC is recommended for E-bike systems because an E-bike requires high initial torque.

Make sure to connect the phases and the sensors wire in the right sequence( blue-blue, green-green, yellow-yellow). A wrong connection will damage the controller and invalidate the guaranty.

Sensored pin illustration: Pin 1 = Ground -

Pin 2 = Phase C Pin 3 = Phase B Pin 4 = Phase A

Pin 5 = Temperature control Pin 6 = Positive + 5V (+/- 10%)

