



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: The ESC is not plug & play. It needs to be programmed. If you do not follow this procedure correctly, it will invalidate the guarantee))

Warnings:

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

Product Features:

- Electronic speed controller designed for RC boats / jet / car / Hely. Can be used also for * E-Bike.
- Battery voltage from 2S to 24S LiPo.
- Simple set function value by Pro-Box, by PC via USB kits or by transmitter.
- Two way communication while connecting it with computer.
- Firmware will be upgraded automatically.
- Enables setting the voltage per cell for the point at which the controller's cut off circuitry.
- engages. Li-MH/Li-Po from 2.0-3.2V, Ni-Cd/Ni-Mh 0.4-1.0V.
- Timing settings may be adjusted (0°- 30°) per degree to suit the motor type.
- 3 types of throttle curve.
- 3 types of acceleration control.
- Motor rotation reversal via the controller's Firmware.
- Auto cut off power within 3 seconds if no radio signs.



High voltage

Function Value:

- Heli Mode : **Constant RPM**/Normal.
- MOTOR POLE N° : motor poles number **2-4**, 6-10, 12-14.
- TIMING : **0°**, 1°, 2°, 3°, 4°30°.
- ACCELERATION : Soft / **Medium** / Hard.
- ACCUMULATOR TYPE : **Ni-XX**, Li-XX.
- NiCd/NiMH CUTOFF : **×0.05V**, 0.4V, 0.5V, 0.6V, 0.7V, 0.8V, 0.9V, 1.0V, ×0.05. means the cut off voltage is 5% the voltage while connecting.
- NUMBER OF CELLS: **Auto**, 2, 3...
- LiPo CUTOFF : 2.0V, 2.1V, 2.2V, 2.3V, 2.4V, 2.5V, 2.6V, 2.7V, 2.8V, 2.9V, **3.0V**, 3.1V, 3.2V.
- INI POINT : **Auto**, fixed 1.0mS, fixed 1.1mS, fixed 1.2mS, fixed 1.3mS, fixed 1.4mS, fixed 1.5mS.
- END POINT : **Auto**, fixed 1.7mS, fixed 1.8mS, fixed 1.9mS, fixed 2.0mS.
- THROTTLE CURVER: Logarithmic, **Linear**, Exponential.
- ROTATION : **Left**/Right.
- TIMING MONITOR : **On**/Off.

Note: the **red** values are the factory default value

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 Kit. After connecting with ESC motor, receiver and battery, you can set the function value

- **Normal/constant RPM function value**

This ESC has two different types of mode, one which is constant RPM and another which is normal mode with soft start. Change mode setting procedure as follows:

1. Move throttle stick on full power position, turn on the transmitter. Now when switching on the ESC, programming sequence will start.
2. Connect the power to the ESC.
3. Turn on the receiver.
4. After 5 seconds you will hear a four tone melody which signals that the programming sequence is ready.
5. Immediately after the first melody, move throttle stick in to motor stop position. ESC change **Mode** is signalled by beeping according to new **Mode**, once means **Normal**, twice means **Constant RPM**.

From this point the ESC works with the new program.

Note: From this point the ESC is armed and any throttle stick movement will make the motor start.

● **Timing function value**

By transmitter you can change 4 different timings (motor ignition advance). You **must** set timing value according to different motors:

- Timing 1 (0 -7° % ignition advance)
- Timing 2 (8 -18° % ignition advance)
- Timing 3 (19 -24° % ignition advance)
- Timing 4 (25 -30° % ignition advance)

Timing setting procedure as follows:

1. Move throttle stick to full power position, turn on the transmitter. Now when switching on the ESC, programming sequence will start.
2. Connect the power to the ESC.
3. Turn on the receiver.
4. After 5 seconds you will hear a four tone melody which signals that the programming sequence is ready.
5. After waiting 5 seconds again, the different timing steps will be indicated by melodies. You will get five one to four tones as below:

- Five times one tone in a row means timing 1
- Five times two tone in a row means timing 2
- Five times three tone in a row means timing 3
- Five times four tone in a row means timing 4

6. While the desired step is indicated by the tone signal, move the throttle stick into the motor stop position
7. The ESC changes mode and this is signalled by one of the four melodies above.

Note: From this point the ESC is armed and any throttle stick movement will make the motor start.

Low voltage cut off function value

Low voltage cut off mode can be set by transmitter.
Setting procedure as follows:

1. Move throttle stick to full power position, turn on the transmitter. Now when switching on the ESC, programming sequence will start.
2. Connect the power to the ESC.
3. Turn on the receiver.
4. After 5 seconds you will hear a four tone melody which signals that the programming sequence is ready.
5. After waiting 5 seconds again, the different timing steps will be indicated by melodies. You will get five one to four tones. Leave throttle stick in full power position and wait.
6. The three different frequencies will be indicated by the melody. They are given by long and short beeps as below:

- Long tones: 33% of battery tension while connecting, at least with 4 V (for Nicd7NiMh).
- Long and short tones: cutoff with approx 6.0 V (for 2 Lithium polymers cells).
- Short tones: cutoff with approx 9.0 V (for 3 Lithium polymers cells).
- Long, short, long tones: reverse

7. While the desired function value is indicated by tone signal, move the throttle stick into motor stop position. The new function value will be signalled by a melody.

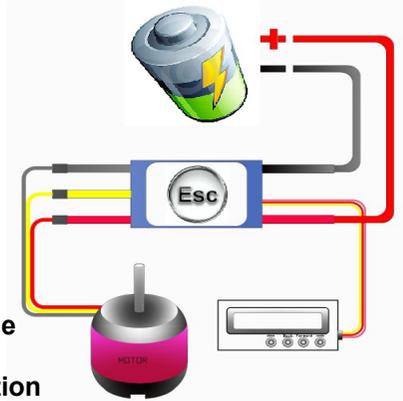
Note: From this point the ESC is armed and any throttle stick movement will make the motor start.

Function value setting by Program Box:

By Program Box you can set all of the function values very simply.

Setting procedure as follows:

1. Put the JR tip of ESC plug in any of the 3 pin connectors in the Program Box
2. Connect the ESC and Motor (Check the illustration)
3. Now you will hear a beep, which will indicate that the connection is ok and you can go on.
4. The Program Box displays the name of the company first, after 5 seconds press any button and you will see the first function MODE-TYPE setting interface:
5. Press < or > button to select your ESC type (airplane, heli, boat or car). Then press FORWARD button to select the right model under CONTROLLER TYPE, Then press < or > button to select the model. If your selection is right, the motor will beep.
6. From now on, you can press BACK and FORWARD button to enter in desired function item, then press < and > button to change the value. Every change will make the motor beep. This indicates that the setting value has been sent to the ESC.
7. After completing the setting, turn off the ESC and disconnect the Program Box.



The last function value will be recorded in the Program Box.

Note: If the ESC you are setting is not BEC, you will have to power the Program Box via another 3 pin connector.

Function value setting by PC:

The APS ESC can also be programmed with your PC by the APS software program. With the USB kit an ESC can communicate with a PC, then you can set the ESC function value on PC screen. Easy operation with a clean interface. If use first, you must install the USB driver and the ESC software.

Installation of USB driver

Please note: This process is not required if you have received the APS Pen drive. You need to plug the Pen drive in to the computer USB port and install the driver.

The following tells you how to install the driver under win2000/XP:

1. Plug the USB adaptor in the USB port on the PC. The PC will automatically detect the USB adaptor and ask for installation of the USB driver.
2. Please select "install from a list or special position" (Advanced), and press "Next".
3. Please select "Search for the best driver in this location" and check "Include this location in the search". In the search dialog specify the location of the USB driver that is located in the CD folder "USB driver".
4. After finishing the installation, the above steps will be repeated. Please repeat the operation fully, until the installation is complete.
5. Find the device manager of Windows.
6. Find "Ports" in the list and click the + sign to the left
7. Find the line that reads "CP210x USB to UART Bridge Controller (COMx)". The "COMx" text is the COM port that was assigned to the USB to serial converter. This is the port that you will select in your ESC programming tool software.

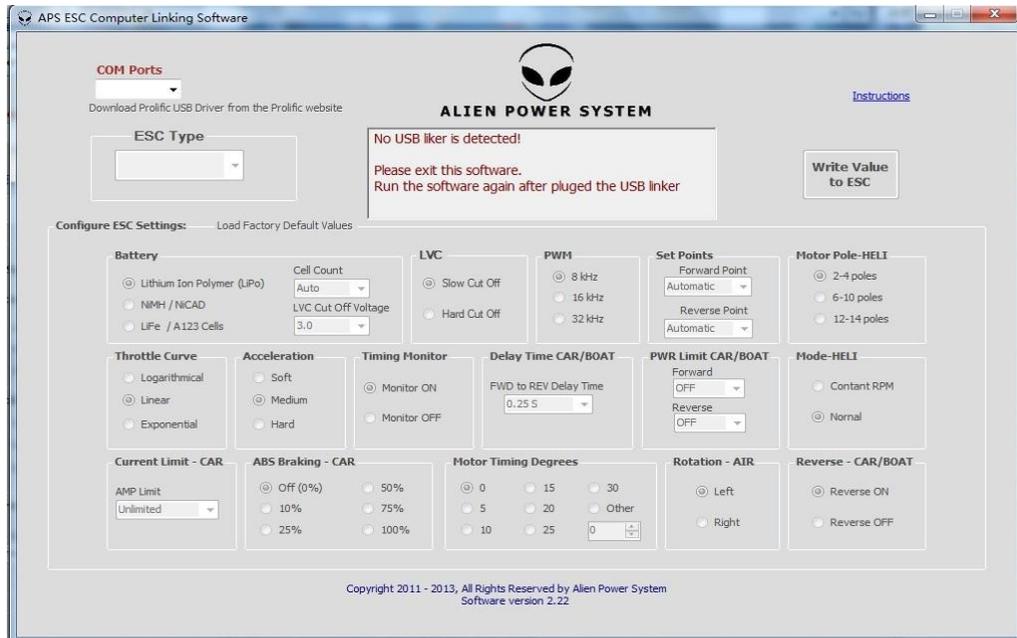
If for any reason, after this steps on your computer the USB driver doesn't work, you can directly download the driver from Prolific website

Note: different computers will have different numbers of COM ports, remember this, you will use the right port number in the ESC setting software.

Installation of ESC setting software

The installation of ESC setting software is the same as normal windows software in windows system. You need to run setup and install it according to the directions. After installing, run it and you will see an interface picture like the picture below. On the top right of the interface is an "Instruction" button. Please click and read carefully.

ESC Function value setting procedure



1. So as not to damage the ESC it is important to disconnect the battery, the motor and the receiver before you start to program.
2. Be sure that the USB link driver has been installed correctly. Plug your APS USB link in to the computer.
3. Launch the APS ESC Computer Link software. You can see an interface which is mentioned above. Because the APS ESC is not connected yet, the interface is not operative.
4. The COM port can be automatically selected. The automatic selection is usually right, but some computers have too many COM ports. You must select manually the correct COM port in case an error COM port was selected.
5. Connect the 4pin wires of the USB link to the 4pin wires of the ESC. Be sure that the colour of the ESC wires are the same as the colour of the USB link wires, otherwise you could possibly damage the ESC. If your connection is right, the APS ESC type will display in the ESC type column.



If it doesn't display nothing, you need to pull out the 4pin wires and plug it again or change the COM port until the APS ESC type will display in the ESC type column.

6. You can see now the setting value of the APS ESC.
7. You can change any setting value from the program area, you also can press the "load factory default" text to load the factory default value.
8. After you finish your adjustment press the top-right "write" button and your setting value will be sent to the ESC.
9. Disconnect the 4pin wires,
10. Exit the APS ESC computer software.
11. Pull out the USB link.
12. Now your ESC has been programmed.

*** Please note: An E-bike system is not an RC system. The RC system works to the max power for a few minutes with a relative small load. E-bikes mean that you ride on the road with a big load for a long time. APS controllers have been tested on E-bikes with very good results. For E-bike applications please contact us for more info and suggestions. You need to consider different mechanical and electronic aspects. Some of the fastest E-Bikes 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 powerfull batteries, motors and controllers.**

NOTE: We recommend using a 3S LiPo battery pack when programming for the first time the ESC in order to practice. This is a precaution to familiarize 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 me know prior to rating/voting and i will assure you i will find a solution as soon as possible.

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

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 loose 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%)

