

Extreme Flight RC

Airboss Electronic Speed Control

Dear customer,

Congratulations on the purchase of your new Extreme Flight RC Airboss Elite Series Brushless ESC. This latest series of controllers is unique in that it is equipped with a robust internal switching Battery Eliminator Circuit (BEC) that allows the use of up to 5 lithium polymer cells in series without the need for an external BEC. This internal BEC delivers 5.2 volts to your receiver and servos and is capable of delivering a continuous 3 Amps of current, 4 Amps peak.

Please read and pay careful attention to the following instructions before you start to work with your motor and controller. These instructions contain important programming information that can keep you from ruining your motor, batteries, and ESC. Model aircraft can cause serious injury and destruction of property. This is not a toy!

Your Airboss Elite Series controller is equipped with a ferrite ring “choke” to minimize interference. Depending on your radio system, you may or may not need this device. It is easily removed by unwrapping the wire from around the ring. Always range check your flight system on new aircraft with the motor running before flying.

Wire Connections:

Motor Connections - The speed controller can be connected to the motor by soldering the 3 wires directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tube.

Battery connections – Solder the connectors of your choice on to the red and black battery wires. The red wire corresponds to battery (+) and the black wire to battery (-). **Reversing the battery connections will destroy the ESC.** The maximum length of the battery pack wires should be 6 inches.

Receiver connection – Plug the “JR” connector into the receiver throttle channel.

Installing the Controller:

Install the controller in the model so that it is free from vibration and shock, using Velcro or double sided foam tape. Make sure there is sufficient cooling for the controller by ducting air through cooling holes from outside airflow. **Failure to do this could cause controller shutdown or damage.** Mount the BEC switch securely.

Transmitter set up:

Check that throttle end point settings are +/-100% .
For Futaba transmitters, reverse the throttle channel.

Normal start up:

Switch the transmitter on and pull the throttle stick down to idle position.
Connect battery pack to the controller
Turn receiver switched “On” (BEC switch on).
You will hear one tone for **Brake on** or two tones for **Brake off**.
The position of full throttle will be calibrated automatically.
You motor now is ready to run.

SAFETY WARNING:

- Always connect the motor battery pack just before flight and disconnect it immediately after landing. The battery will be drained if left connected.
- Once the motor battery pack is connected, handle the model with extreme care!
- Ensure that you are well clear of the propeller at all times.

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- A rotating propeller is extremely dangerous!
- Even when the receiver (BEC) switch turned "OFF", the motor battery pack may still be connected. Handle the model with extreme care and stay clear of the propeller!

The controller comes programmed with the following factory default settings:

Brake	:	Off	Lets the propeller coast
Battery type	:	3 Li-Poly	Prevents battery from being drained below 8.4V
Soft start	:	Enable	Accelerates motor slowly
Low Voltage Cutoff	:	Reduce power	Slow motor when battery is low
Timing	:	Auto	ESC advance timing mode
Frequency	:	8KHz	ESC switching frequency
RPM Control	:	Off	Governor mode for helicopters

How to program your controller:

The ESC is programmed by using the transmitter throttle stick as directed below and responding to the tones produced by the motor. The tones are played in the order below. Responding to a tone with the throttle stick changes a setting. After making a change, disconnect the battery. Start over to make another change. To leave programming mode without making a change, disconnect the battery from the ESC.

- **REMOVE PROPELLER**
- Switch on the transmitter and push throttle stick to full throttle.
- Connect the motor battery pack and turn on the receiver (BEC) switch.
- Wait for 5 seconds, you'll hear __ -- (two low tones followed by two high tones)
- Setup mode is entered
- When you hear the desired tones from below, pull the throttle down, you will hear two confirmation tones. The setting is now memorized.
- You can only change one setting at a time, if you need to change more settings, disconnect the battery from the ESC and wait 5 seconds, and repeat the above procedure for the next setting.
- You can exit the programming mode at any time if you disconnect the battery from the ESC.

1. Setting up the propeller Brake on or off

Follow above procedure to enter the programming mode.

If you pull the throttle stick to off within 5 seconds, **Brake** will be changed. (ON → OFF, or OFF → ON)

When you connect the battery to get ready to fly, you will hear one tone for **Brake on** or two tones for **Brake off**.

2. Battery type

(Select battery type that is being used in your model)

NiCad: (50% of initial voltage)

. (5 single beeps)

2S Lipo: (6.2V cutoff)

.. .. (5 double beeps)

3S Lipo: (9.3V cutoff)

... .. (5 triple beeps)

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4S Lipo: (12.4V cutoff)

.... (5 quadruple beeps)

5S Lipo: (15.5V cutoff)

..... (5 quintuple beeps)

3. Rotation reverse

This function is to change the motor rotation direction.
(For example: Right to Left, or vice versa)

Reverse motor rotation

W W W W W (5 double warble tones)

4. Soft start (Acceleration)

When a gearbox is used, it's highly recommended to enable the soft start feature to protect the gearbox, especially when large diameter propellers are used.
Disable the soft start function when direct drive is used or for speed competition.

Enable: VV VV VV VV VV (5 dual warble tones)

Disable: V V V V V (5 single warble tones)

5. Low Voltage Cutoff (LVC)

If the motor battery pack drops to the programmed cut-off voltage, the controller will either ignore, reduce the motor speed or stop the motor to ensure that there is enough power for the receiver and servos. You can resume normal operation by pulling down the throttle stick and pushing it up again, **but remember that it's time to land your model!**

Ignore

(Motor won't stop until battery IS DRAINED)

_-- _-- _-- _-- _-- (single low tone followed by dual high tone)

Reduce power:

(Reduce motor speed)

_- _- _- _- _- (single low tone followed by single high tone)

Cut off:

(Stop motor – Motor can be restarted by moving throttle stick down to idle position)

-_ -_ -_ -_ -_ (single high tone followed by single low tone)

6. Timing (advance timing)

The controller has three timing modes; Automatic works perfect for **ALL** types of brushless motor. For some brands or homemade brushless motors, you have to set the right timing for optimal efficiency and power; 7 degree for multi-pole motors, 30 degree for out runner motors.

Automatic: (7 ~ 30 degree)

- - - - - (five short tones)

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Low Advance: (7 degree)

-- -- -- -- -- (five double short tones)

High Advance (22 ~ 30 degree)

--- --- --- --- --- (five triple short tones)

7. Switching Frequency

The controller has two switching frequencies. 8KHz is good for ALL types of two pole motors, 16KHz is good for multi pole motors.

8 kHz:

\ \ \ \ \ (five warble down tones)

16 kHz:

/ / / / / (five warble up tones)

8. Restore Factory Default Setting

_____ (five long tones)

For Helicopter Use Only.

This ESC provides three different ranges for RPM control.

9. Active RPM Control (Governor mode)

Rpm control off (this setting for airplane use)

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First range (up to 20.000 electrical rpm)

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Second range (up to 50.000 electrical rpm)

--- --- --- --- ---

Third range (up to 100.000 electrical rpm)

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Caution! Warning!:

Model aircraft equipped with high power motors can kill. High power motor systems can be very dangerous! High currents can heat wires and batteries, causing fires and burning skin or anything. Follow the wiring connection carefully!

Always fly at a sanctioned field. Never fly over or near spectators. Even though this controller is equipped with a safety arming program, you should still use caution when connecting the battery.

Notice for Operation:

- Do not exceed 16 NiCad NiMh cells or 5S Li-Poly cells in series.
- Temperature overload protection is built into the speed controller, it turns off the motor immediately when the temperature reaches 212°F/100°C.
- Do not connect the controller to just 'any' kind of power sources. Take care to ensure that the right polarity of NiCad, NiMh or Li-Poly power packs.
- The controller will be destroyed if connected to the battery with the wrong polarity.