



Azure Hawker

Micro Electronic Speed Controller Manual

With built in light controller and low voltage servo output



The Azure Hawker ESC is to be used a part of a kit and does not function as a standalone product. We accept no liability due to the use of this product.

Product Description:

The Azure Hawker Electronic Speed Controller, is a brushed, 4.2A, bi-directional speed controller. It is designed for small scale model RC vehicles. It has a built in a brake and smooth throttle modulation. Included is a light controller to control 4 light sets. It also includes a low voltage (4.2V) servo output for micro servo.

Package Content:

1 x Azure Hawker Electronic Speed Controller

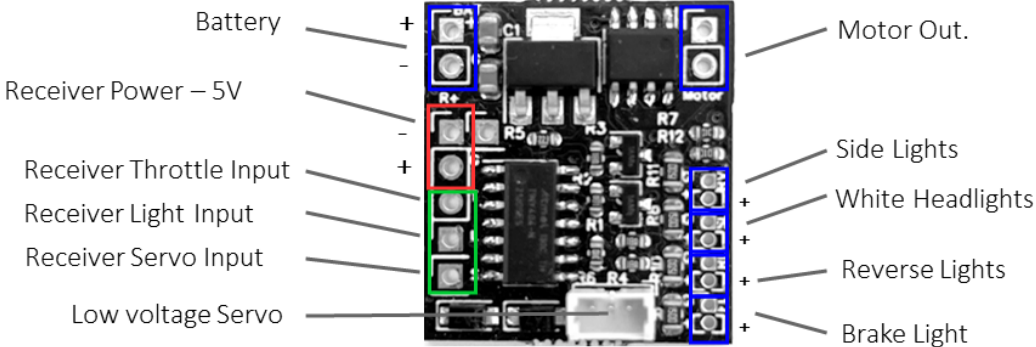
Warnings:

Warning: lithium batteries are dangerous. Please read in detail the safety warning of your batteries before connecting.

Warning: ensure that all connections are correct before connecting the battery. Incorrect connections and shorts could result in damage to the battery or the ESC.

Warning: the device may get hot during use. Particularly on 3s and with a high demand on the 5v output. Allow the device to cool before touching.

ESC Pin Out Diagram



ESC Specification:

Max Battery Voltage	15V
Min Battery Voltage	6.6V (2S)
Recommended Battery	2S (8.4v)
Battery Type	LiPo
Max Receiver Inputs	5V
LED Output Voltages (resistors onboard)	5V
Regulated Output (BEC)	5V
Max Motor Continuous Current	4.2A

ESC Specification continued:

5V Output Continuous Current (including servo and LED power)	120mA @ 8.4V (peak 1A) 80mA @ 12.6V (peak 1A)
LED Outputs (resistors pre installed) White Headlight (WL) Side Lights (SL) Brake Lights (BL) Reverse Light (RL)	11 mA (with white LED's) 13 mA (with orange LED's) 13 mA (with red LED's) 9 mA (with white LED's)
Low Voltage Servo Voltage	4.2V
Motor Low Voltage Cutoff 2S Lipo 3S Lipo	6.6V 9.9V

Instructions:

1. Solder battery connectors to the BAT inputs. Cable choice is dependant on the battery to be used. Red wire to the + sign and black to the - sign.

NOTE: THE ESC IS NOT POLARITY PROTECTED CHECK CONNECTIONS BEFORE PLUGGING IN BATTERY

2. Solder motor connectors to the motor output pins, the cable choice is dependant on motor connector.

Note: The motor connectors may require reversal if the reverse light is used and it lights during the wrong direction. The orientation is specific to the model.

3. The connections used to connect to the receiver are dependant on the features required from the ESC:
 1. If motor control is required only, then 3 pins are required; 5v, ground and throttle in.
 2. If the light control is required allowing control of the white lights and side lights then an additional channel needs to be soldered onto the light input pin.
 3. If the low voltage micro servo is required, then the servo output of the receiver needs to be soldered to the steering input pin.

4. Solder on any LEDs to the LED output pins. If more than one LED is connected they should be connected in parallel. LED's on a single pin have to be the same LED colour, any colour can be used per pin. See the light section of this manual to understand the light control outputs.

Note: There is no limit to the number of LED's per pin wired in parallel, however the brightness of the string will drop with every additional LED added.

Lights

The ESC can control 4 sets of lights. A set of example current ratings are giving in the specification. This value will vary slightly depending on the led colours chosen but any LED combination can be used for any pin. The lights will work with either no light input connected, a two position switch or a 3 position switch. The control of each pin is described below.

1. *White Lights (Headlights)*

1. *3 Pole Switch - 3 levels of brightness; 0%, 50% and 100%.*
2. *2 Pole Switch - 2 Levels of brightness; 0% and 100%*
3. *No connection - Output at 100%*

2. *Side Lights*

1. *3 Pole Switch - 2 levels of brightness; 0%, 100% and 100%.*
2. *2 Pole Switch - 2 Levels of brightness; 0% and 100%*
3. *No connection - Output at 100%*

3. *Brake Lights*

1. *3 Pole Switch - 3 levels of brightness; 0%, 50% and 100% (when ESC is braking)*
2. *2 Pole Switch - 3 levels of brightness; 0%, 50% and 100% (when ESC is braking)*
3. *No connection - 2 levels of brightness; 0%, 100% (when ESC brakes)*

4. *Reverse Light (no control with switch)*
 1. *3 Pole Switch - 2 levels of brightness; 0%, 100% (when ESC is in reverse)*
 2. *2 Pole Switch - 2 levels of brightness; 0%, 100% (when ESC is in reverse)*
 3. *No connection - 2 levels of brightness; 0%, 100% (when ESC is in reverse)*

Low Voltage Cutoff

The ESC includes a low voltage cut off that will cut the power to the motor when the voltage of battery is too low, for a period of time. When the cut off is activated the ESC will flash the red brake LED's to signal that the cutoff is activated.

The cutoff will automatically detect upon power on whether a 2S or a 3S LiPo is connected and set the cut off voltage accordingly. The cut off voltage are set to the values found in the specification section of this manual.

ESC Motor Braking

The ESC includes a motor drag brake, which activates automatically when the throttle stick is centred. The brake reduces the speed of the vehicle upon activation. This effect is more apparent on the higher RPM motors, due to the lower rolling resistance. It will also reduce the speed that the vehicle will roll down a hill.

The braking effect is proportional to the motor speed and therefore cannot hold the vehicle stationary. The braking force is set at 70% but is adaptive and will increase up to 100% if only small amounts of throttle have been used to aid with climbing and descending.

5 Volt Output

The 5 voltage output is powered by a linear regulator and it supplies the; receiver, LED's and micro servo output. The output can supply a peak of 1A but the rated continuous current of the output can be found in the specification table in this manual, and is dependant on the battery voltage.

If the rated continuous current is superseded for a period of time then the regulators high temperature cutoff might enable and the ESC will shut down. Once the temperature has dropped the power will resume. The ESC is recommended for a 2S battery.

Safety Start Features

The ESC will only activate when powering on, once a valid throttle signal has been registered, and the signal is roughly a centred stick. This stops the model running away during startup, particularly if the radio is not setup correctly. The front white lights will illuminate dimly if the vehicle is in its safety start mode.

The ESC will also cut power to the motor instantly if a throttle signal is lost. The side lights, headlights, and brake lights will be illuminated to help locate the model. A failsafe must be set on the throttle output of the receiver. Please refer to the manual of your receiver to how the failsafe is set to ensure there is no risk of runaway.