

Product Functions

• Battery Management

There is a built-in Battery Management function in the speed controller. The power cut off timing is based on the cell number and continuous current drains of the battery. There are two options defined in the battery management, one is for Li-Polymer batteries and another for using with NiMH battery. The battery management allows you to protect your batteries from over discharge and moreover to extend the lifetime of your batteries.

• Flying Mode

The flying mode function offers you four options for different aircrafts. You could choose from Airplane, Glider, Helicopter without governor and Helicopter with governor.

Set Up Procedure

1. To enter set up mode and throttle calibration

Due to the signal differentiation amount different remote control brands, it is strongly recommended to run the throttle curve initiation process whenever set up a new aircraft.

- I. Shifting the throttle position to the full throttle/full speed.
- II. Power on the transmitter
- III. Power on the speed controller, the motor will come up with acknowledge tones 
- IV. Moving the throttle position to the minimum/stop position, the motor will come up with acknowledge tones 

The speed controller recognized the exactly throttle range then optimizes the throttle curve after this progress. When finish the calibrating process, you could simply shutdown the power to leave the other settings unchanged. If not, simply waiting for 1 second. The speed controller will enter the set up mode.

2. Battery Management

The first section of setup is **battery management**. This section offers 2 options for using with either NiMH or Li-Polymer battery. The motor will come up the corresponding tones as indicator. The following is the indication with graphic reference.

- Standard discharge protection for Li-Polymer (Factory Default) 
- +5V cut-off protection for Ni-MH 

When intending to choose one of above options, simply push throttle stick from minimum/stop to maximum/full throttle after the indication tone, then pull throttle stick back to the minimum/stop position to confirm after the acknowledge tone. You could simply shut down the power if you don't need any further settings. If you want to skip this section and leave current setting unchanged, just keep throttle stick in minimum position and wait the speed controller to enter next section.

3. Flying Mode

The following section is **flying mode** setting. This section offers 4 options. They are Airplane, Glider and Helicopter without Governor/with Governor. The motor will come up the corresponding

tones as indicator. The following is the indication with graphic reference.

- Aircraft 
- Glider 
- Helicopter with Governor 
- Helicopter without Governor (Factory Default) 

When intending to choose one of above options, simply push throttle stick from minimum/stop to maximum/full throttle after the indication tone, then pull throttle stick back to the minimum/stop position to confirm after the acknowledge tone. Shutdown the power, and now the speed controller is ready to fly.

More about Battery Management System

This section gives you more details of the smart design of battery management in order to help you to utilize the function. Technically the power cut off timing was based on the cell number and continuous current drains of the battery. The speed controller will calculate the timing and cut the power off with two steps. Because the last stage of each battery discharge cycle has quick voltage drop, such function will provide a safe process during the operation.

1st step: enabled when the single cell reaches the low point, the motor will be forced to lower the RPM by microprocessor

2nd step: enabled when the single cell reaches the lowest point defined in the system, the motor will be completely cut off. To regain the power, the user needs to adjust the throttle stick to the "stop" position until the battery voltage comes back to the safe level.

The following are the detailed definition of each option in battery management.

- NiMH battery
 - +5.0 volt cut off
- Li-Polymer standard discharge (Factory Default)
 - 1st step voltage @ **2.9V**
 - 2nd step voltage @ **2.6V**

Caution!!

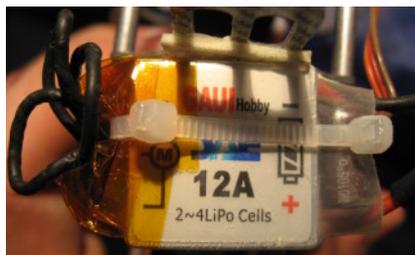
High power motor systems could be very dangerous. High current could generate heat on wires, batteries, and motors. Always follow the instruction and use proper tools to set up the system within safe range. Always fly at a designed field with caution even though this controller is equipped with safety arming program.

GAUI ESC programming

Programming instructions for the GAUI SAE 12A brushless motor controller

Note: [Flying Hobby](#) has the original manual for download: Information tab / Download Docs / ESC manual / GAUI 12A & 50 A. BTW, nobody ships faster than Mr. Fung...

I had also requested the manual from the manufacturer, and they sent it within one day. Thanks, GAUI!



Note that the ESC calibrates the throttle range while entering programming mode.

Make sure that the throttle commands from the transmitter really reach the endpoints as desired!

The LiPo battery mode reduces engine power and turns it off, when the voltage reaches a point where the battery would suffer damage.

The NiMH mode turns off, when the voltage is getting too low for receiver and servos.

Below a flowchart of the programming features of said motor controller. It is used for example in GAUI EP 100 / EP 100 SE electric radio controlled helicopters.

The default settings are "LiPo", and "heli with governor off".

Comments regarding the governor:

- It can cause dropouts during flight, where the engine power is suddenly reduced to maybe 30 %. It may be possible, that the low voltage protection circuit triggers in LiPo mode.
Possibly this can be circumvented by setting to NiMH mode, at the risk of accidental deep discharge.
- I experienced dropouts, when the throttle curve was not flat.
- The governor causes a small "wobble" in headspeed, and that can cause tail shaking. It's not like steady oscillation, as with too much gyro gain, more like random shaking.
- After landing and spooling up again, the headspeed was not the same it was in the first flight. I don't understand how this is supposed to work, and won't use governor.



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Note:
 The GAUI manual for the 50 A ESC lists "heli/governor" as function 2/4 instead of 2/3 as shown.
 Heli modes include soft startup.