LipoMon

LIPO battery controller with programmable speed limiter

LipoMon is a controller for LiPo battery pack designed to use a standard motor controller (brushed or brushless) with the new LiPo batteries.

The standard regulators, not designed for LiPo and only compatible with NiCad and NiMh, use a safety threshold value to stop the engine and avoid a deep battery discharge that is too low for LiPo.

This means that when the safety cut-off detects the low voltage limit and stops the engine, your LiPo batteries are already damaged!

LipoMon will override the regulator cut-off and protects your LiPo batteries monitoring the right threshold value; when the critical voltage is detected, instead of stopping the engine as normal cut-off, **LipoMon** starts a soft, progressive engine limiter that reduces engine power slowly down to a user programmable value, to give you time and limited power for a safe landing.

1 Main characteristics

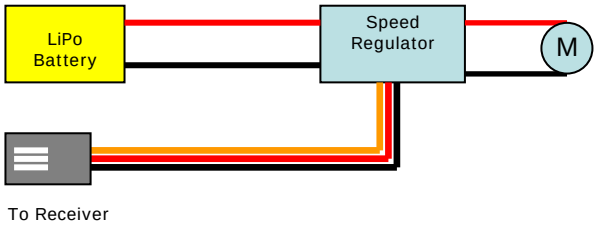
- Compatible with 2,3 and 4 LiPo cells pack.
- Auto-detect of number of cells and charge value check at start-up with diagnostic warning signal.
- Programmable speed limiter with soft and progressive intervention.
- Hi power LED for start-up diagnostic and limiter action signal.

2 Connections

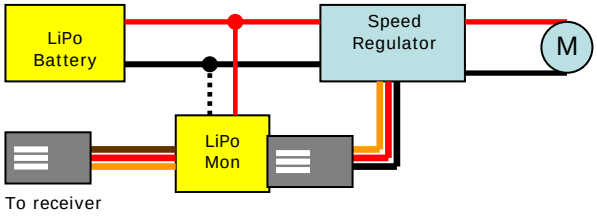
LipoMon must be connected to the main battery and to the receiver, in the channel used for the speed regulator; the speed regulator must be connected to the **LipoMon.**

All the signals from receiver to the regulator are filtered and processed by the **LipoMon**; in this way **LipoMon** will not affect the power that the regulator can handle and this makes **LipoMon** compatible with every kind of regulator and motor set, standard or brushless.

Normal connection:



LipoMon connection:



Normally there is no need to connect the GND (dotted black) wire to battery pack: use it only if **LipoMon** is unable to detect the number of connected cells.

3 Speed limiter

The speed limiter has a factory pre-set to allow, when active, a 0% to 60% excursion of the engine command; when the speed limiter is active and the engine is at a value greater then the 60%, the power is slowly reduced to the limit value regardless of the current position of the control; if the control is already under the limit value nothing happens on the motor: you can apply more power, but you cannot exceed the limit.

During normal function the LED will blink at every 2 seconds to indicate that everything is working well. When the speed limiter is active, the LED is always switched on.

4 Programming

The speed limit value can be programmed to adapt to different models and motors characteristics.

! Warning !

During this operation the engine will be started. Check that the model is properly blocked and take all the needed safety precautions.

To activate the programming procedure set the engine control to the minimum and power on the system with the **LipoMon** pushbutton pressed; you can release the pushbutton when the LED starts blinking.

After 5 slow blinks the LED will turn on for two seconds to indicate that the minimum power value has been stored; the LED will now start blinking fast and you have to set the motor control to the upper desired limit value (the value that allows you to do a safe landing) and press the pushbutton to exit the programming procedure.

The LED will be on for two seconds to indicate that the programming phase has been successfully completed. The new value will be effective the next time the system is switched on.

The speed limiter will use the programmed value as the limit to allow a safe recovery of the model.

After 3 minutes from the time of speed limiter intervention, the engine power will be in any case slowly reduced to 0% (engine completely off) to preserve battery.

5 Cell auto-detection

When switched on **LipoMon** measures the battery voltage to calculate the number of cells in the battery pack and displays that number with the same number of LED blinks; when 3 cells are detected, the LED will blinks 3 times and this indication is repeated 5 times.

Sometimes, with some regulators with an external BEC switch, it could happen that **LipoMon** fails to read battery voltage and will not work: switch off and wait 5 seconds before switching on again.

If the number of cells in the pack is different from the displayed number, **do not flight at all!!** check the wiring, the connectors, the battery charge state, but **do not flight** until the problem is solved.

If the battery pack is not completely charged, it is possible to have an error in cells number auto-detect, as 3 cells partially charged may have the same voltage of 2 cells fully charged.

When the voltage detected can be interpreted in different ways, **LipoMon** will display the cells number with very slow blink rate, to alert the user that the cells number must be checked. If you are not sure that everything is correct do not fly!! This is a warning indication telling you that something on your model must be checked and adjusted!!

The number of cells that **LipoMon** can detect is only referred to cells connected in series, normally marked as *n*S in the battery pack description. I.e. a pack marked **3S**1P is made with 3 only cells, and the detected value is 3, but a pack marked as **2S**2P is made with a total of 4 cells, but the detected value is 2, as the other 2 cells are connected in parallel and don't affect the total battery pack voltage.

6 Technical data

Dimension (mm)		25x14
Weight (g)		2
Supply voltage from B.E.C. (V)		4-5.1
LiPo cells number		2 - 4
Voltage detect accuracy		±0,5%
Cells detection voltage	Nom	Max
2 cells battery pack	7.4	8.8
3 cells battery pack	11.1	13.2
4 cells battery pack	14.8	17.6
Activation threshold – 2 cells (V)		5.6
Activation threshold – 3 cells (V)		8.4
Activation threshold – 4 cells (V)		11.2

7 Board connections