4S 30A Li-ion Battery Charging and Protection Module (BMS 4S 30A)

This 4S 30A lithium battery charging and protection module, also known as a **BMS 4S 30A**, is designed for 4-series Li-ion or Li-polymer battery packs. It provides safe charging, discharging and full protection for your battery pack with a nominal voltage of 14.8 V and a full charge voltage of 16.8 V.

Features

- Suitable for 4-series (4S) Li-ion / Li-po battery packs
- Nominal pack voltage: approx. 14.8 V
- Full charge voltage: approx. 16.8 V
- Maximum continuous discharge current: up to 30 A (depending on model and cooling conditions)
- Protection functions:
  - Over-charge protection
  - Over-discharge (under-voltage) protection
  - Over-current and short-circuit protection
- Cell balancing function on many models (balancing voltage between cells to increase pack lifetime)
- Compact PCB, easy to integrate inside battery packs

This module is ideal for DIY battery packs for cordless tools, light electric vehicles, small solar systems, emergency lighting, RC and robotics projects, and other medium-current applications.

Typical Applications

- Cordless drill and power tools
- Electric scooter and light e-bike packs
- DIY power banks and backup power systems
- Small off-grid solar systems
- RC cars, robots and hobby projects
- Low to medium power inverters

How It Works

The BMS continuously monitors the voltage of each cell and the pack current. During charging, it allows current to flow until the cell voltages reach the safe limit, then it cuts off charging to prevent over-charge. During discharge, if any cell voltage drops below the protection threshold, the BMS disconnects the load to avoid deep discharge. In case of short circuit or over-current, the module immediately cuts off the output to protect the battery and wiring.

Many 4S 30A BMS boards also include **cell balancing**, which helps keep cell voltages equal during charging, improving pack performance and lifetime.

Wiring (Typical)

Common terminals on a 4S BMS:

- **B-** : negative of the first cell / pack negative
- **B1, B2, B3, B4** : taps between each cell
- **B+** : positive of the last cell / pack positive
- **P+ / P-** : main power terminals for charger and load

1. Connect four Li-ion cells in series to create a 4S pack.
2. Connect cell taps to B1–B4 according to the wiring diagram.
3. Connect pack negative and positive to B- and B+.
4. Connect charger and load to P+ and P-.

Always double-check the wiring order; wrong connections can damage the BMS or the cells.

Notes

- Use cells with the same capacity, type and level of charge when building a 4S pack.
- Provide adequate cooling (heatsink / airflow) if you use the module close to its maximum current rating.
- Use a proper 16.8 V Li-ion charger suitable for 4S packs.
- Observe polarity carefully; reverse connection can permanently damage the board.