

# What Does The Li-Ion Protect Circuit Do?

- ◆ **Protect Circuits Provide Charge Control Inside Battery Pack**

Regulator for solar panel charging not needed.

Charge pack using only power supply with current fold back mode or equivalent Standby operation now available with Li-Ion

- ◆ **Protect Circuits Provide Cell Balancing**

Balancing during charge only (existing technology)

Continuous balancing (new patent pending SWE technology)

Increase pack life up to 10 years.

Ability to balance multiple series connected packs

(new patent pending SWE technology)

- ◆ **Protect Circuit monitors each cell in the battery pack and disconnects the battery pack from the load or charger, if one of the following occurs:**

Cell voltage during charge is too large (greater than ~4.3 Volts)

Short circuit discharge of pack terminals (current  $\gg 2C$ )

Continuous cell discharge current is too large (greater than ~2-3C)

Cell voltage during discharge is too low (less than ~2.3 Volts)

## Why is This Protection Needed?

- ◆ **The Li-Ion Battery can be damaged or lose cycle life if:**

Charge or discharge currents are too high ( $>0.7C$  or  $>2C$ , respectively).

Cell is discharged so much that the cell voltage falls below about 2 Volts.

Cell is continuously overcharged above 4.3.

