CellSpy™

Lithium Ion Battery Management System

Features

- Continuous cell balancing to 0.005v
- Cell voltage and temperature measurement
- Pack level current measurement
- Discharge and charge monitoring and cutoff
- Solid state over-current shutdown in <40usec
- Internal temperature monitoring
- Optically isolated scalable architecture supports strings to >1,000v
- Real-time state-of-charge calculation
- Non-volatile statistical logging
  - peak temperatures
  - peak current
  - cycle count
  - average SOC at charge
  - lowest SOC
  - etc.
- CANbus 2.0b, RS232, Ethernet interfaces
- Operating temperature -55 ℃ to +85 ℃
- Conduction cooled, sealed aerospace design

Today's advanced lithium ion batteries represent a large financial investment for manufacturers. Maximizing system performance is critical. Phillip's CellSpy is a complete system that supports all aspects of battery management and charging for military, industrial, and automotive applications.

CellSpy is compatible with today's advanced lithium ion chemistries, including manganese and iron phosphate types in various capacities and form factors. CellSpy continually monitors the voltage of every module, the current flowing out of or into the pack (via internal current shunt), its own internal temperature and of every module in the pack (through remote thermistor sensors).

CellSpy uses advanced real-time microprocessor techniques for cell balancing operations. The process used for balancing works dynamically and continuously, not just at the end of the charge process, enabling charger disconnect at any time while maintaining a balanced battery pack.

CellSpy provides remote statistics, including real-time pack voltage, current, ambient temperature, SOC, and cycle count through its integrated external interfaces. The unit has eight digital I/O expansion lines available for custom applications. These can be used to drive indicators, turn on or off chargers, remote fans, etc.

The integrated current shunt simplifies installation and provides real-time current status, coulomb counting, and over-current protection (OCP). Two configurable levels of OCP are provided in CellSpy: *timed* and *instantaneous*. *Timed* OCP allows the pack to discharge up to a specific rate for a defined period of time before shutoff. *Instantaneous* shuts the pack off immediately, in less than 40usec.

CellSpy performs State-of-charge (SOC) calculations based on voltage levels, discharge rates, coulomb counting, and pack state of health, compensated for temperature. The system also logs parametric data to its integrated non-volatile memory. The recorded data can be retrieved at any time over the Ethernet maintenance interface and analyzed to evaluate system performance. The statistics recorded show environmental conditions, load demands, charging profiles, operating time, charge cycles, and so forth. Such data can be used for product improvement and warranty evaluation purposes.

CellSpy is a smart web enabled appliance that is instrumented for internal self-test. Its Ethernet based diagnostic interface is accessible by web browser enabled devices with an Ethernet interface, eliminating the need for expensive diagnostic equipment for servicing.

CellSpy is typically configured to specific customer requirements. Please contact Phillips to arrange a demonstration and further discussion.

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