Battery Cell Monitoring System

Lead-acid batteries have a reputation for failing in open-circuit mode. This problem presents itself most often in DC and UPS systems that have inadequate battery management and is the main reason why some customers still pay seven-to-ten times more for equivalent capacity Nickel Cadmium cells in which the (less problematic) common failure mode is short-circuit. Magellan Power now offers Battery Cell Monitoring (BCM) systems that almost entirely resolve this problem.

Irrespective of any battery optimisation techniques being employed, a lead-acid battery will always fail, eventually. But VRLA batteries rarely fail without undergoing significant internal ohmic changes that can be detected and used to trigger an early warning system. The internal impedance of lead-acid batteries rises as they age and, correspondingly, their available storage capacity reduces until finally the battery will not support the load for any duration.

Magellan's BCM uses non-intrusive measuring techniques that are so gentle on the battery that many battery monitoring and testing functions are performed automatically every day, or hour. Such frequent testing of each individual cell or block means that the BCM user becomes aware of a problem on the day or hour that it occurs and is not left exposed to a sudden battery failure as they are with bi-annual or even quarterly scheduled battery testing.

The Battery Monitoring System consists of a master control unit and a series of cell monitoring transducer blocks. The Master control unit can operate as a stand-alone unit or be incorporated into a Magellan MCR-II series, microprocessor-controlled charger.

Standard BCM systems can be delivered within weeks, ready to monitor 24V, 48V, 110V, 120V, 198/204V and 400V DC systems with sensors to suit individual 2, 6 or 12V blocks.

The Magellan Battery Cell Monitor

A cell monitoring transducer block

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Technical Specification

ITEM	SPECIFICATION
System Interfacing	Individual 2V cell or 12V bank monitoring modules connected to control card via isolated RS485 & DC power bus. Flying leads with minifit plug.
Maximum Cells in String	127
Input Power Supply	120-370Vdc / 85-264V AC nominal dual input
Display	128 x 64 Graphical LCD Blue Background White LED Backlit Text
Cell Voltage Summary Screen	Mean ± Std.Dev. Cell Voltage Minimum Cell Number Maximum Cell Number
Cell Voltage Histogram Screen	Graphical Histogram of Cell voltage distribution
Cell Temperature Summary Screen	Mean ± Std.Dev. Cell Temp. Minimum Cell Number Maximum Cell Number
Cell Temperature Histogram Screen	Graphical Histogram of Cell temperature Distribution
Cell Impedance Summary Screen	Mean ± Std.Dev. Cell Impedance. Minimum Impedance Cell Number Maximum Impedance Cell Number
Cell Impedance Histogram Screen	Graphical Histogram of Cell impedance distribution.
Discharge Summary Screen	Average Depth of Discharge Maximum Depth of Discharge Estimated Remaining Cycle Life of Battery Estimated Life Derating of Battery Capacity
State of Charge Summary Screen	Estimated Battery Capacity Remaining Time Left to Low Voltage Discharge Current
Charge Summary Screen	Average Charge Current Maximum Charge Current Average Discharge Current Maximum Discharge Current
Deep Discharge Summary Screen	Deepest Discharge Level Counter of Deep Discharge Events Average Time Spent in Deep Discharge Maximum Time Spent in a Deep Discharge
Keypad	Membrane Decal Mode / Alarm Acknowledge Menu Up (+) Menu Down (-)
Status LEDs	Red Alarm LED Flashes until Acknowledged with Mode Button then Steady until Alarm Reset Green Battery OK LED
Optional Communications Interface	10MB/s Ethernet 10-base-T Internal Website with system summary Modbus TCP Protocol DNP3
Configuration Interface	Via Ethernet or RS232/RS485 Modbus Protocol Dedicated Software
Setpoints	Stored in Non Volatile Memory Editable from Front Panel
Logging System	Cell voltage statistics (mean, min, max, min cell, max cell) Cell temp. statistics String current statistics Impedance Test Mode: Cell impedance statistics

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