orionJr. BMS

Lithium Ion Battery Management System for 12V—48V Applications (Revision C)

Designed Use

- Designed for Lithium Ion battery packs up to 48V nominal (60V max)
- Individual cell voltage rating: 0.2v to 5v per cell tap
- Supports from 1 to 16 cells in series
- -40C to 80C operating temperature range
- Integrated low loss passive cell balancing to within 10mV
- Cell voltage resolution of about 1.5mV

Applications

- Light mobile applications (scooters, golf carts, etc.)
- Solar & wind energy storage
- Uninterruptible power supply
- Battery backup

Basic Functions

- Over-voltage and under-voltage protection
- Over-current protection
- Temperature protection
- Intelligent cell balancing
- State of charge monitoring
- State of health monitoring

Additional Functions

- Data logging capabilities
- Stored diagnostic information
- Programmable interfaces
- Current limit calculations (intelligent current limiting)
- Stored battery usage statistics including histogram data

Display Options

- Interfaces with third party smartphone software (CAN version only)
- Optional basic state of charge display
- Optional data logging display

The Orion Jr. BMS is a product of Ewert Energy Systems, Inc.

Ewert Energy Systems is a research and development company focused on developing solutions for plug-in hybrid and electric vehicles and other energy storage applications.

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Interfaces

- 2 digital signal outputs for controlling charge and discharge limiting mechanisms
- 1 digital signal output for controlling a battery charger
- 1 CANBUS 2.0B interface [optional] (both standard and extended IDs supported)
- 1 digital RS-232 interface for programming and diagnostics
- 3 multi-purpose outputs with software assignable functions (2 on Rev. B)
- 1 multi-purpose input with software assignable functions
- 3 analog 0-5v outputs that represent the following signals: Charge Current Limit (CCL), Discharge Current Limit (DCL), State of Charge (SOC).
- 3 thermistor inputs (additional monitoring possible with thermistor expansion module) (2 on Rev. B)

Features

- Centralized design allows for faster polling of data resulting in increased accuracy and resistance to EMI
- No cell boards (all electronics are contained within the unit.)
- Supports OBD2 protocol for storage of diagnostic trouble codes, freeze frame snapshots and polling of live data
- PC software can be used to monitor battery performance, read and reset trouble codes, program battery profile information, and update settings
- Accurate amp-hour and pack state of charge tracking (with correction based on cell open voltage)
- Retains data when power is lost (no always-on power source needed)
- Charger integration to allow for tapering of current during charge (if supported by charger)
- Battery profile information and settings are field programmable via PC utility.
- Internal resistance is measured for all individual cells
- Pre-calculated charge and discharge current limits
- Stores a snapshot of active data when faults occur for easy problem diagnosis.

Dimensions

- 7.14 in (W) x 4.01 in (L) x 1.50 in (H)

Specification Item	Min	Typ.	Max	Units
Supply Voltage	10		60	Vdc
Supply Current—Active (Rev. C)		1.1		W
Operating Temperature	-40		80	C
Digital Output Voltage (Open Drain) (Rev. B & C)			60	V
Digital Output Sink Current (60v max—Rev. B & C)			175	mA
Analog Outputs Voltage	0		5	V
Cell Voltage Measurement Range	0.5		5	V
Cell Voltage Measurement Error (over 1-5v range)		0.25		%
Cell Balancing Current			150	mA
Cell Voltage Resolution		1.5		mV

Optional Specifications	
Item	**Value**
CANBUS speed (on supported units)	125, 250, 500, or 1000 Kbps
Current Sensor Values Supported (all 50mV shunts)	20A, 50A, 100A, 150A, 200A, 333A, 400 A, 500A (600A and 1000A supported with reduced resolution

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