

# s-BMS 48v - 16 cell monitoring

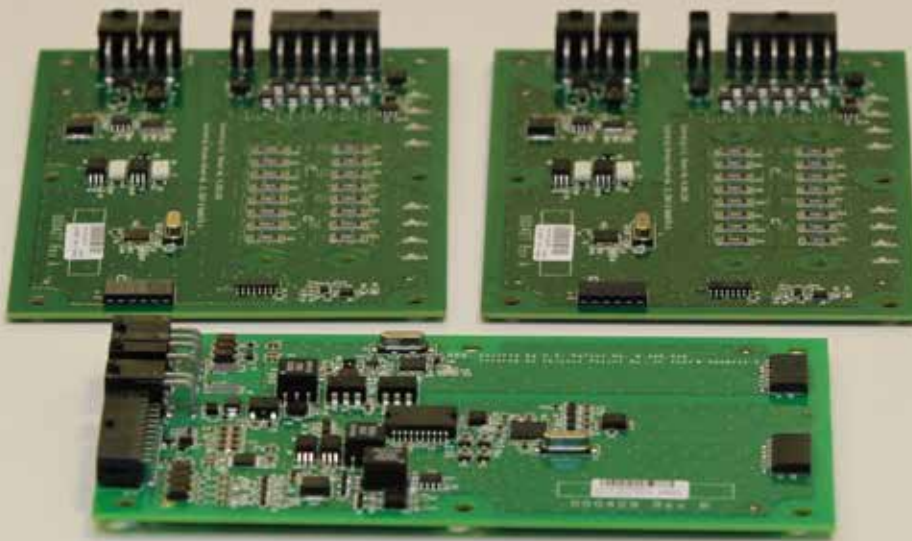
Loose board Battery Management system

## LiTHIUM BALANCE

BATTERY MANAGEMENT SYSTEMS



TECH-MOBILE.HU



### ROBUST INTEGRATION SYSTEM OPTIMIZED FOR 48V APPLICATIONS:

- Electric vehicles
- Hybrid vehicles
- Marine vessels
- Energy storage

## INTRODUCTION

The 48V optimized s-BMS is a very cost effective solution for industrial, motive and stationary battery packs. It manages rechargeable lithium batteries of any chemistry and from any battery supplier allowing you maximum battery sourcing freedom.

The master Control board and 2 LMU boards monitors up to 16 cells in series, and can be used stand alone as a 12-48VDC BMS. The system is easy to integrate into a customized battery pack. Connector harness for customized integration can also be supplied.

The PC Diagnostic Software provides displays for monitoring battery and BMS performance. It also allows you to configure all battery parameters such as limit voltages and temperatures, allowable charge and discharge rates or improve SoC estimation with your own battery model.

CAN frames can be constructed at "Bit level" to broadcast the parameters measured and calculated. A post processing module allows you to scale and manipulate values and broadcast them on the CAN bus with no custom development needed. This allows the s-BMS to work as a drop in replacement for many existing systems.

## FLEXIBILITY

12 VDC to 48VDC

Up to 16 cells in series

All battery parameters easily configured

User-definable event responses and warnings

User configurable I/Os and CAN messages

Battery model for intelligent rate control

Embedded post processing of CAN values

## SAFETY

Detection of 27 error modes and 17 warning conditions

Noise and vibration robust

-40° to +85°C operational range

## FUNCTIONALITY

Cell voltages 0-5V,  $\pm 2\text{mV}$  accuracy

SOC and SOH estimation

LEAK detection

Cell balancing up to 840mA/cell

Cell and Pack resistance estimation

Thermal management

Advanced charger control

Data Logging

## TESTED TO HELL SO YOU CAN USE IT ON EARTH WITH CONFIDENCE!

- Electromagnetic interference >200 volts/m
- Fast transients 4kV on all inputs
- HALT tested on all 3 vibration axes
- Tested from -90°C up to 120°C

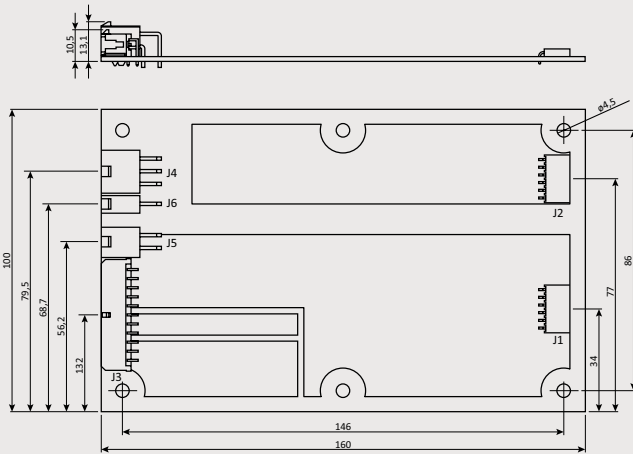


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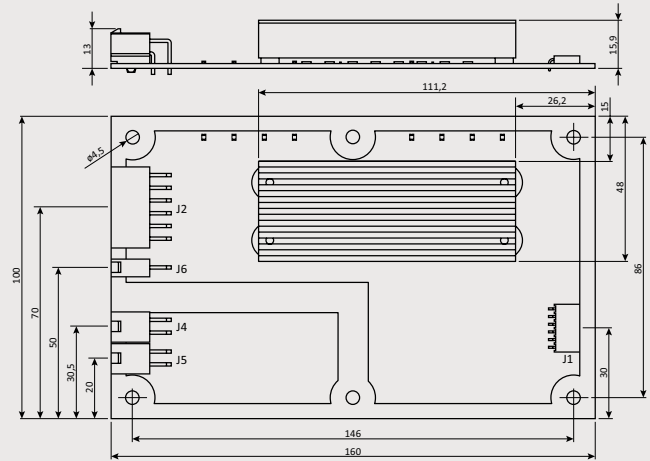
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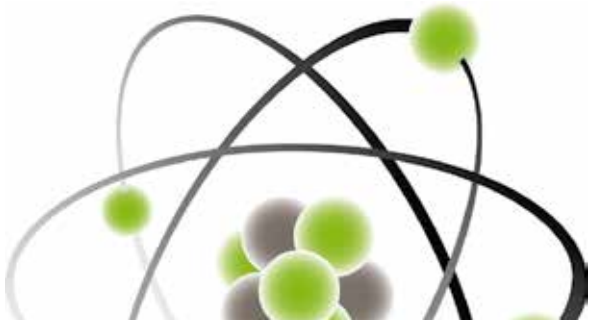


**BMCU - Battery Management Control Unit**



**LMU - Local Monitoring Unit**

<b>System Voltage Range</b>	12 - 48VDC
<b>Cells in System</b>	3-16 Cells
<b>Capacity</b>	Up to 5000 Ahr
<b>Balancing Current</b>	Up to 840mA @ 4.2VDC
<b>Input Voltage</b>	Control Unit only: 12 VDC (9VDC - 14VDC)
<b>Current Consumption:</b>	Control Unit only – from 12V supply: <150mA operating Both Units - from cells: <20mA operating
<b>Temperature Sensor</b>	1 to 4 per Unit. Type NTC , 10KΩ @ 25 DegC , β Value : 3900
<b>Measurement Specifications</b>	Cell Voltage: Range 0-5V, Accuracy ±2mV typical, <±10mV max., Sampling 1Hz Temperature accuracy ±1.5°C (dependent on sensor) Pack voltage 0-48V, accuracy ±1V, Sampling 5 Hz Current Measurement by Shunt (100 – 1000 μΩ) , 400mV max, Sampling 5 Hz
<b>Dimensions</b>	1 x BMCU board: 160 x 100 mm, 20 mm stacking height 2 x LMU board: 160 x 100 mm, 20 mm stacking height
<b>Control IOs</b>	HV Contactors, Charge Contactor, Precharge Contactor
<b>User Defined IOs (max. 3)</b>	Fan Control, Heater Control, HV Interlock, Low SOC Warning, Mid Pack Relays, Error LED, Off Board Leak Detection, Low Power Charger Mode (e.g. dual chargers)
<b>Communication</b>	CAN bus 2.0 A&B for system integration RS232 PC diagnostics interface
<b>Charger Control Options</b>	Analogue voltage control, PWM 1-5 KHz, CAN 2.0 A&B
<b>Protection Modes</b>	Capable to monitor and handle 27 safety critical error modes Capable to report 17 unique warnings conditions Capability to broadcast system status, errors and warnings over CAN
<b>Diagnostic Tool</b>	Licencing via USB Dongle (allowing multiple device usage) Supported Operating Systems: Windows Professional, XP, Vista, 7, 8 Pro Version - Calibration Development capability Service Version - Field Service & troubleshooting Requires USB to RS 232 converter cable or RS232 port on device
<b>EMC Immunity</b>	Tested as per EN61000-4-3 (80MHz – 1000MHz) at 200 V/m, EN61000-4-4 (4kV)
<b>Temperature</b>	-40° to 85°C
<b>Vibration Tolerance</b>	Tested as per EN60068-2-6 random vibration (10 – 1000Hz)
<b>Certifications</b>	CE marking
<b>Patents</b>	U.S. Patent No. 8,350,529. China Patent No. ZL 2007 8 0048774. Patents pending



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