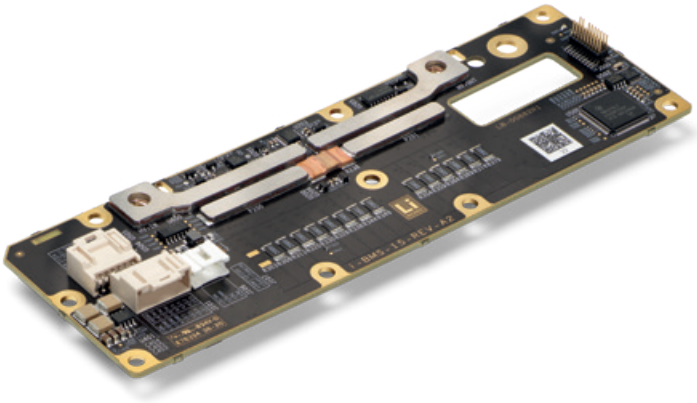
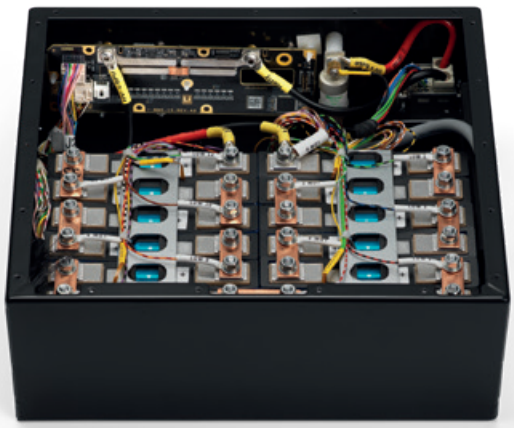
LiBAL i-BMS15™

Integrated Battery Management System for 15 cells

LiTHIUM BALANCE

BATTERY MANAGEMENT SYSTEMS





INTRODUCTION

The i-BMS is a cell chemistry agnostic, compact integrated BMS developed for the cost-optimized mass-production of Light Electric Vehicle (LEV) applications. It can monitor up to 15 cells in series, covering applications up to 60V, such as 2-, and 3-wheelers, ESS, AGVs, and robotics.

While measuring only 65 x 200 mm, the i-BMS is equipped with everything it needs to manage and maintain a battery system without the need for any external components. This includes a built-in pre-charge circuit, on-board current measurement, mosfet power switches for battery disconnect, and a DC/DC power supply.

Using its safety-rated, powerful dual core lockstep CPU and ASIL C compliant ASIC, the i-BMS can reach temperature accuracy up to +/-1 °C and cell voltage measurement accuracy of +/- 1,5 mV, throughout the entire temperature range (-10 to +70 °C).

The i-BMS' software design features parallel pack and hot swap capability, while advanced SoX algorithms ensure high precision. Using the BMS Creator™ configuration software, the i-BMS allows the battery designer to create a unique battery by defining application-specific BMS parameters and safety strategy, optimizing battery performance and battery life.

SAFETY

- ASIL C safety rated key components
- Self-test and redundancy in safety critical measurement circuits
- Advanced SoX algorithms
- Open circuit detection

BATTERY LIFE

- High frequency sampling of current (100ms) allows optimal detection of pulses
- Powerful and intelligent passive balancing at 200mA per cell

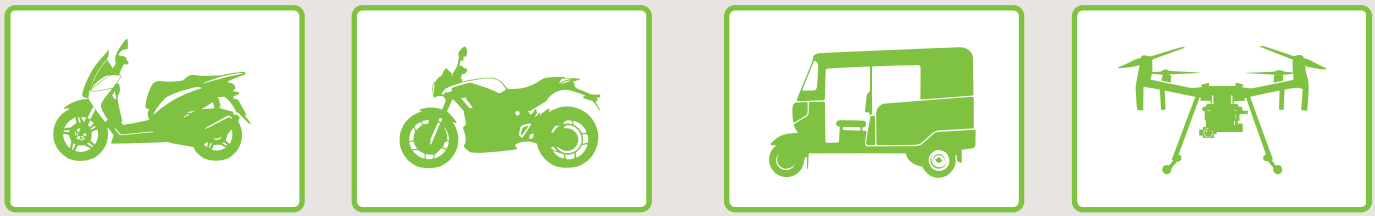
PERFORMANCE

- SOC accuracy of ±3%
- SOH accuracy of ±2% point from 80% SOH
- Auto-off/sleep mode enables low power consumption in idle mode
- ±1 °C accuracy in temperature measurement

USABILITY

- RTC + logging of events, errors, and warnings
- BMS Creator PC tool for easy configuration
- On-board current sensing
- On-board mosfet power switches
- CAN UDS tool
- Parallel pack capability
- Hot swap functionality

Applications



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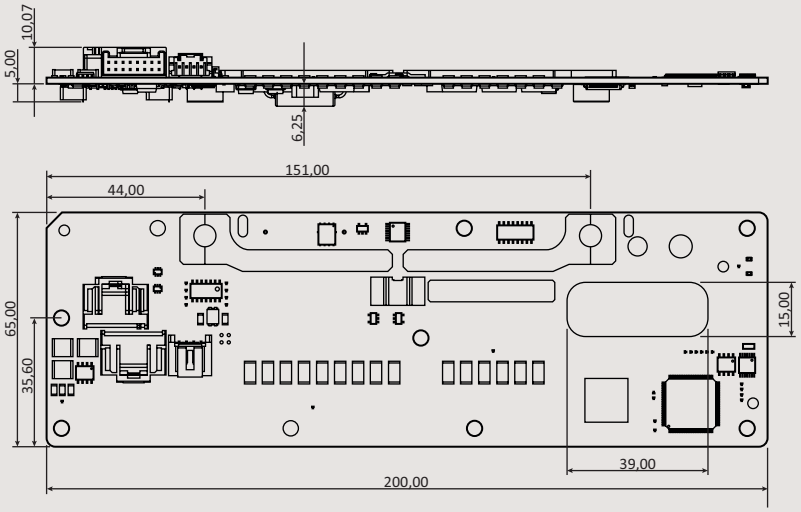

i-BMS15

Dimensions in MM

	PARAMETERS	SPECIFICATIONS
Performance	SOC accuracy	±3%
	SOH accuracy	±2% -point from 80% SOC
	Balancing efficiency	200mA per cell
	Accuracy of HV measurement	±100 mV
	Accuracy of temperature measurement (NTC)	±1 °C (from -10 to 70 °C)
	Standby consumption (sleep mode)	3.12 mW (Max)
	Active consumption	1.5 W (Max)
	Cell balancing current	200 mA
	Cell voltage, current, and temperature sampling frequency	100 mS
	Single cell voltage measurement accuracy (0,5 – 4,5 Vdc)	±1,6 mV (at 25 °C)
	Current measurement accuracy	±0,5% @ 120A
	Range of temperature measurements	From -40 to +120 °C
Hardware	Number of Voltage channels	8-15 channels
	Range of HV measurement	17 – 60V
	Detectable cell voltage range	0-5 Vdc
	Maximum current, continuous	100A (per parallel string, subject to variations between strings)
	Peak current in maximum 10 seconds	150A (per parallel string, subject to variations between strings)
	Dimensions (L x W x H) & weight	200 x 65 x 18 mm, 93g
	Temperature channels	4 on-board, 6 external (NTC)
	On-board current measurement	Yes – Auto-calibrated on-board shunt
	On-board power disconnect	Yes
	CAN ports	1
	On-board RTC	Yes
	Pre-charge control on board	Yes – 300 mS for 7 mF via 10 Ω
	Bi-directional current protection	Yes
	Number of GPIOs	4 independent open drain outputs
	Maximum drain voltage of GPIOs	36V (max 30V)
	Maximum guaranteed GPIO continuous drain current	0.7A (max 0.5A)
Software	Communication	CAN communication CAN 2.0 A/B; 11 bit and 29 bit ID's
	Charger Control Interface, Diagnostics Interface	CAN, CAN UDS
	Parallal pack / "Hot Swap" functionality	Yes, 6 battery packs
	Adjustable freeze frame memory	Yes – Defaults to 18s of data with 150 entry samples leading to event
	SOP estimation based on cell degradation	Yes – 3 configurable time intervals
	DC/DC auto-off shut-down	Yes

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