Batkon
Battery Control Technologies

For Smarter Batteries

BMS*Lion*

Lithium Battery Management System

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Battery Monitoring

Battery cells need to be connected serial to obtain useful DC voltages necessary for several applications.

Depending on the cell chemistry each cell can have 2 to 4.5 VDC (2.1 for LiS, 3.2V for LFP and 3.7V for LCO/NMC/LCA etc.) nominal voltage.

Serial connected battery cells are charged or discharged over one leg of current stream.

Cell temperatures very important specially on charge stage to be followed.

BMS*Lion* is designed to «follow» all necessary parameters of battery packages. System collects all «intelligence» information related with battery pack. Such as cell voltages, temperatures and current.

BMS*Lion* System Structure

LBC (Lithium Battery Controller) Card is the main control card which has 32-Bit ARM micro controller. The current measurement of battery pack is done by external Hall Effect current sensor.

LBC can control the battery pack charge and discharge contactors or MOSFETS. LBC reads the voltage and temperature values of the battery cells via probe cables.

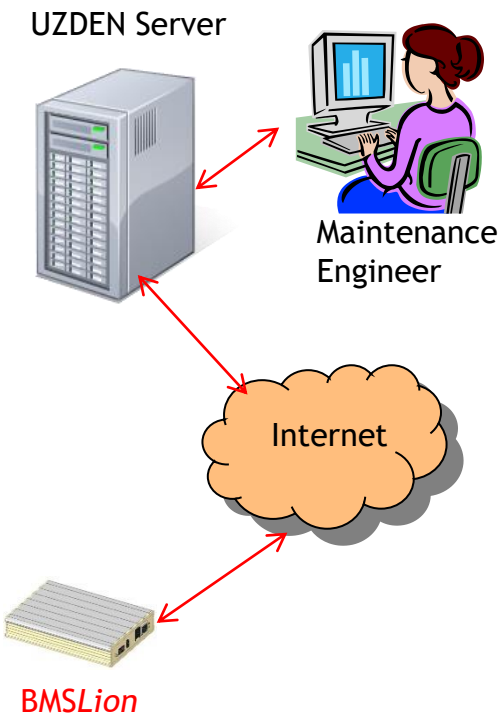
LBC load control interface has 2 load control MOSFETs. These open drain MOSFETS can pull down any contactor coil or external MOSFETs

BMS*Lion* System is not only «monitor» the battery pack. LBC can also «balance» voltages by using «Passive Balancing» method. Depending of the imbalance level and Ah capacity of the cells, balancing period can differ from a couple of hours to weeks.

External «Current Detection and Control – CDC» module can be connected to LBC. Hall Effect current sensor and two power MOSFETs are available with short circuit protection feature on the CDC module.

BMS*Lion* Remote Monitoring & Control

In the BMS*Lion* LBC unit there is a RJ45 Ethernet interface for remote management and IoT functions.



Ethernet (RJ45) interface is used to «gateway» functionality for «Internet of Things-IoT». TCP/IP connection and supported IoT protocols is used to transfer collected data logs onto the cloud server called UZDEN.

BMS*Lion* can also store collected data locally. USB-A type 2.0 interface is used to connect standard USB memory devices. LBC card can «write» logs as text CSV format into the USB memory.

Optionally RJ11 connector and isolated RS485 driver can be placed onto LBC card. System supports RS485 ModBus protocol as well.

LBC sends "keep alive" message to remote monitoring server and basic alarms and voltage data will be sent in this data package

Keep alive message period is set by the server (1 sec to hours)

Remote Monitoring & Control engineer can initiate an online connection to site over the server.

In this mode LBC can send more detailed parameters to server in every 1-5 sec.

Remote Monitoring & Control engineer can manage the server. If it is needed battery group currents and charging parameters can be adjusted by the engineer.

Server could download the version updates to LBC card's flash memory and LBC install the new version firmware onto its memory itself

Technical Data:

Physical Dimensions:

BMSLion Module
- 28 x 110 x 150 mm (H x W x D),
- 250 gr

Electrical:
- Input Voltage: 12V… 70 VDC

Environmental:
- Operation Temperature: -10 ... 60 °C
- Relative Humidity: 90% RH

LBC (Lithium Battery Controller) Card Specifications:

- LBC Microcontroller: ARM M3, Cell monitoring chipset: MAXIM
- Cell Balancing Method: "Active Balancing" Flying Capacitor circuit or Passive with 75 / 300 mA balancing current
- Cell Protection Feature: Charging stop alarm in case of any cell voltage exceeds OVP (2.5 - 4.5V) , discharging stop alarm in case of any cell voltage drops under UVP (0.5 – 3.0V)
- USB-A interface for maintenance PC and USB Memory connections (firmware upgrade or offline data loging)
- RJ45 Ethernet for Remote monitoring & Control system and IoT
- 2 LED System Alarm and status monitoring display.
- 8 ports NTC type temperature sensor connections
- 2 ports MOSFET driven charger/discharge control pins (<5A) (pull down)
- 16 ports Cell voltage monitoring (0.5 – 4.5V)
- External Hall Effect Current sensor port (5V compatible)
- Optional
    - isolated RS485 – RJ11 interface for site Management systems
    - 2 pole «dry contact» alarm relay
    - 2 ports MOSFET driven (<5A) Load on/off pins (pull down)
    - 2 ports isolated CAN-Bus interface
    - Additional hall effect current sensor connection
    - Digital and analog I/O

BMSLion Front Panel

BMSLion Rear Panel