

Battery management system

with extreme low power consumption

The German battery manufacturer **Diehl & Eagle Picher GmbH** has developed an extremely economical battery management system for battery packs. The smart electronic is designed for Li-Ion and LiFePO₄ and is equipped with a cell-balancing function besides the safety functions as overvoltage, undervoltage, overcurrent and temperature.

When the battery is unoperated, the electronic system falls into a sleep-mode and consequently has a battery drain of less than 4 µA. Hence, the self-consumption of the Battery management system is lower than the self-discharge of a single cell of the battery pack. Due to an intelligent charging and discharging detection, the sleep mode of the battery is automatically deactivated by charging or discharging the battery. The extreme low power consumption allows a long storage life without requiring any maintenance. The period until damages at the battery pack occur by deep discharge is significantly extended by the battery management system.

The capacity is highly accurate determined by Impedance Tracking and can be displayed on the battery with the help of a charge level indicator. The battery data can also be issued by use of communication. An error memory as well as a memory with important parameters is integrated and can be readout through the communication interface.

Communication with the battery can be made either via I²C, UART, SPI, USB 2.0, CAN Standard V2.0b or CAN Aerospace. Data can also be transmitted by wireless communication via NFC.

Due to the interface not only data can be transmitted from the battery, but also parameters in the battery can be changed. As a consequence a flexible adaption to the application is possible.

A battery charge indicator is included in the electronic system. In order to guarantee a gentle load, JEITA temperature ranges are set and the requested load value for voltage and current are transmitted to the battery charger through the communication interface. The cells are adjusted by a passive balancing during the load process.

The electronic system is conceived for 2 to 4 series-connected cells and covers a voltage range from 5 V – 16.8 V. Consequently the electronic system can be adjusted to customer's requirements.

Due to the variety of Li-cells adapted for the project, Diehl & Eagle Picher is able to produce high quality battery packs which meet all requirements of the user.

