Wireless Battery Management System of Electric Transport

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Abstract

Electric vehicles (EVs) are being developed and considered as the future transportation to reduce emission of toxic gas, cost and weight. The battery pack is one of the main crucial parts of the electric vehicle. The power optimization of the battery pack has been maintained by developing a two-phase evaporative thermal management system which operation has been controlled by using a wireless battery management system. A large number of individual cells in a battery pack have many wire terminations that are liable for safety failure. To reduce the wiring problem, a wireless battery management system based on ZigBee communication protocol and point-to-point wireless topology has been presented. Microcontrollers and wireless modules are employed to process the information from several sensors (voltage, temperature and SOC) and transmit to the display devices respectively. The WBMS multistage charging balancing system offers more effective and efficient response for several number of series connected battery cells. The concept of double-torx switched capacitor converter and resonant switched capacitor converter is used for reducing the charge balancing time of the cells. The balancing result for 2 cells and 26 cells are improved by 15.12% and 20.93% respectively. The balancing results are proved to become better when the battery cells are increased. Published under license by IOP Publishing.

Indexed keywords

Engineering controlled terms: Display devices, Battery monitors, Battery modules, Battery lithium, Secondary battery

Compound keywords: Charge balancing, Electric transport, Electric vehicle (EV), Individual cells, Power Optimizations

Engineering main heading: Battery management systems

DOI: 10.1088/1757-899X/1002/3/032029

Document Type: Conference Paper


Publisher: Institute of Physics Publishing