

Rancang bangun battery management system berbasis mikrokontroler = Development of microcontroller based battery management system.

Aliviawan Faiz Akbar, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20504569&lokasi=lokal>

Abstrak

Sistem penyimpanan energi berbasis baterai ion litium berskala besar semakin banyak digunakan. Penggunaan baterai dalam skala besar memerlukan mekanisme proteksi yang andal untuk mencegah terjadinya *thermal runaway* yang dipicu oleh perlakuan tidak tepat pada sel baterai. Proteksi pada sel baterai dapat dilakukan dengan memantau dan mengendalikan interaksi antara sel baterai dengan beban. Proteksi pada sel baterai dilakukan dengan menggunakan *battery management system*. Pemanfaatan kapabilitas mikrokontroler bersamaan dengan *integrated circuit* LTC6802-2 dapat diimplementasikan untuk menjalankan fungsi dasar *battery management system*. Pada penelitian ini, dilakukan perancangan dan pengimplementasian *battery management system*. Penelitian dilakukan untuk menentukan nilai kesalahan relatif dari sensor tegangan, arus, dan suhu. Dilakukan pengujian untuk mengetahui tingkat keandalan *battery management system* dalam melakukan proteksi terhadap kondisi *overcurrent*, *overheat*, *undervoltage*, dan *overvoltage*. Berdasarkan hasil percobaan, didapat nilai rata-rata kesalahan relatif sebesar 0,062% untuk parameter tegangan, 1,488% untuk parameter arus, dan 7,738% untuk parameter suhu.

Large-scale lithium ion battery-based energy storage systems are widely being used. The use of batteries on a large scale requires a reliable protection mechanism to prevent thermal runaway that is triggered by improper treatment of battery cells. Protection of the battery cell can be done by monitoring and controlling the interaction between the battery cell and the load. Protection of the battery cell is done by using a battery management system. Utilization of microcontroller capabilities together with LTC6802-2 integrated circuits can be implemented to carry out the basic functions of the battery management system. In this research, a battery management system is designed and implemented. The study was conducted to determine the relative error value of the voltage, current and temperature sensors. Tests are carried out to determine the level of reliability of the battery management system in protecting against overcurrent, overheat, undervoltage, and overvoltage conditions. Based on the experimental results, the average relative error value of 0,062% for the voltage parameter, 1,488% for the current parameter, and 7,738% for the temperature parameter.