

ABSTRACT

Enhancement of Battery Management System with Individual Cell Monitoring

by

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Batteries have been widely used for many years due to their ability to store energy from various sources and supply it when needed. As the demand for more sustainable energy storage increases, the Battery Management System (BMS) has become an essential solution, providing the capability to monitor, control, and optimize battery performance. However, efficient monitoring is still required to maintain battery performance and safety.

In this study, an individual cell monitoring BMS was implemented and evaluated through no-load and load testing on a four-cell battery pack. The system continuously measured individual cell voltages, battery current, and cell temperatures to observe battery behavior under normal and degraded operating conditions. Experimental results show that the system successfully identified cell-level voltage imbalance and progressive fault conditions that could not be detected through pack-level voltage monitoring alone.