

A State-of-Charge Estimation Method for Lithium-Ion Batteries

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Abstract

In this paper, a methodology to estimate the State-of-Charge (SoC) of a Li-Ion rechargeable battery is proposed. The state of charge indication plays an important role in any Battery Management System (BMS) which has the basic task to ensure that optimum use is made of the energy inside the battery. This is achieved by monitoring and controlling the battery's charging and discharging process. In the proposed scheme, the method used to determine the SoC is based on current measurement and integration during the discharge state (referred to as Coulomb counting) and Electro-Motive Force (EMF) measurements during the equilibrium state.

The proposed system works with a circuit specifically designed by Microchip Technology, which was subsequently programmed to take measurements such as battery voltage, discharging current, calculate fuel used, SoC and remaining run-time and display these results on an LCD.