

Design and Implementation of Battery Management System for Electric Bicycle

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Abstract. Today the electric vehicle (EV) has been developed in such a way that electronic motor, battery, and charger replace the engine, tank and gasoline pump of the conventional gasoline-powered [1]. In other word, instead of using fossil fuel to move the vehicle, in this case we used a pack of batteries to move it. The global climate change and the abnormal rising international crude oil prices call for the development of EV [2]. To solve these problems, a new energy needs to be developed or optimized in order to replace the current energy which is fossil fuel. A clean and green energy [2]. Because of this, it is very important to make sure that the battery that being used is reliable as the fossil fuel. Thus, the design of the battery management system plays an important role on battery life preservation and performance improvement of EV [3]. The BMS also performs many tasks including the measurement of system voltage, current and remaining useful life (RUL) determination, controlling and monitoring the charge / discharge characteristics and cell balancing [3]. For this project, 18650 Lithium-Ion battery is used to develop battery management for 144V 50Ah. As lithium-ion batteries have high value of specific energy, high energy density, high open circuit voltage, and low self-discharge, they are a proper candidate for EVs among other cell chemistries [4].

1 Introduction

The purpose of this paper is to provide a review of past research efforts related to Battery Management System (BMS) for electric vehicle and 18650 Lithium-Ion battery. Some articles discuss on the importance of BMS in electric vehicle while others focusing on the balancing of the State of Charge (SOC) of the battery. The articles discussed on how the BMS help in prolonged the life span of the battery used through cell balancing. The review of the articles showed that the BMS provided the users various operating parameters that