Advances in Automobile Engineering

Extended Abstract

Intelligent battery management system for fuel Vehicles

Prakob Koraneekij[1] and Nedra Bahri-Ammari

South-West University, Bulgaria

Abstract

Sometimes the vehicles wouldn't start this is due to the battery of the vehicle, more especially either it' state of charge (SOC) or its state of health (SOH). The challenge is to devise a user friendly application based battery management tool through which the user can get critical information about the state of charge (SOC) as well as the state of health (SOH) along with the set of actions required to ensure a reliability of the starting is maintained. This application also helps in monitoring the temperature of the car battery. Keywords- state of charge, state of health, battery management system, MQTT protocol. Car Battery is one of the most crucial and essential part of the car elements. The Car battery can majorly hamper your fuel economy drastically. If the car is flat then we have to spend hours to start the car. This will not only waste your time but also exert the engine and decrease the life expectancy. So it is important to monitor and manage the health of the battery. The main objective of this paper is to monitor the health level of the battery, temperature of the battery and over voltage protection through mqtt mobile application. A battery management system is essentially the "brain" of a battery pack. It measures and reports crucial information for the operation of the battery and also protects the battery from damage in a wide range of operating conditions. Battery management system for Electric vehicles, Hybrid electric vehicles and even for monitoring and managing mobile batteries, there are proposed models and applications are used. But for Fuel cars there is no hardware modules or software applications to monitor the SOH of the battery. In this paper, we have used hardware modules such as nodemcu, overvoltage protection circuit, dc buck converter, GSM SIM800L and the software used is Arduino 1.8.7 and the application used for monitoring the battery is linear MQTT (Message Queuing Telemetry Transport) dashboard.

Exisiting system

The Battery Management for electric vehicles have various models and software applications to monitor battery level. The Battery has the great impact on the performance of electric vehicles, basically determining the driving range. Li-ion Batteries are most widely used in the electric cars. The li-ion chemistry is the batterytechnology of choice due to its good energy density, good power rating and charge/discharge efficiency in pulsed energy flow systems. Another important function of a BMS is to extend the battery life by facing the charge unbalancing the issue that may arise in series-connected cells. This reduces the usable capacity of the battery because the least charged cell determines the end of discharge, even if there is still energy stored in the other cells of the battery. Due to the strict voltage limits applying to Li-ion batteries, charge unbalance cannot be self- recovered but instead worsens with time. Battery integration in electric vehicles. There are many aspects for battery integration in electrical vehicles. An example will be given to show the most relevant aspects. The example is derived from the experience gained in the E car project. The battery system uses 96 series connected Li-ion cells with 50 Ah capacity in order to reach the required voltage level of up to 400V. The cells are divided into modules of four cells. The battery pack consists of 24 modules each of them including an electronic circuit for monitoring and balancing the cells.

Prakob Koraneekij
South-West University, Bulgaria Email: info@swu.bg