

Smart Battery Parameter Monitoring System for Electric Vehicles

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ABSTRACT - This paper presents a smart Battery parameter monitoring system for an present Electric vehicle. to monitoring the different n types of parameter like Voltage, Current, temperature, charging, modes of battery monitoring system and detect fire. This system consist different types of Hardware and software. Hardware consist ESP 32 microcontroller, Sensors, WIFI module BMS system, etc. This all Hardware are connected with each other. The data of above parameter are collected from sensor to ESP 32 microcontroller through WIFI module communication we can easily monitor this data at Android application. By Using the Android application we can easily monitor the parameter of battery in real time of data and simultaneously saving of data For Analyzing the battery Management system. This is a realistic model is developed to create final product for the proposed system

Keywords -Electric vehicle, Battery Parameters, Monitoring, Protection, WIFI module, Android Application.

I. INTRODUCTION

This is the big opportunities for the EV market to manufacture, sale, employments of the inflation, Limited stock are available that's why we are moved to EV. But EV manufacture are limited, there is disadvantages of safely. we need to research on EV Introduction In Today's life, days by days there is increasing the demand of Electric vehicles in the market. This is the big opportunities for the EV market to manufacture, sale, employments etc. increasing because of the inflation, Limited stock are available that's why we are moved to EV. But EV manufacture are limited, there is disadvantages of safely. we need to research on EV battery & to Create near to 100% Safely to use EV. There is a big advantage of Energy Saving and less pollution, environmental friendly. In EV, we can used Lithium ion battery. On the other hand, EV has limited travelling range due to Capacity battery storage. One the main advantages we can expand range of traveling by increasing the size of battery capacity. In this

Research paper, we monitor different parameter and control by using the protection system. If there temp, voltage, current overcharging is achieved we disconnect the Connection and find the fault by using the manual and auto mode

By using the auto mode of BMS, we don't need to monitor or control the system manually. We can provide the safety operation to the EV Battery by improving the Research on Project and system of Battery. Battery & to Create near to 100% Safely to use EV. There is a big advantage of Energy Saving and less pollution, environmental friendly. In EV, we can used Lithium ion battery. On the other hand, EV has limited travelling range due to Capacity battery storage. One the main advantages we can expand range of traveling by increasing the size of battery capacity. In this Research paper, we monitor different parameter and control by using the protection system. If there temp, voltage, current overcharging is achieved we disconnect the Connection and find the fault by using the manual and auto mode.

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II. LITERATURE REVIEW

To finding the Problem Objectives literature survey has been conducted. we Collected so many research paper on Battery parameter monitoring system and find problem statements to overcome this problem statement we have finding the Solutions.

A) ESP32 microcontroller based Battery parameter monitoring system for EV.

This paper describes the application of IOT in monitoring the performance of an electric vehicle battery. In this Project, we use the ESP82 microcontroller instead of Arduino Uno, because of in this project, there is no of pin needed but In Arduino, there is limited pin means only 8 pin while ESP 38

has 48 pin. That's why we can perform the multifunction work in one microcontroller.

B) WIFI module based Communication of Battery management System for electric vehicles.

This paper presents the a qualitative analysis of WFI based communication protocols. we can connects Hardware and software by using the WIFI module based communication. In this project, all hardware and software are connected with each other .so, we can Communicate all information from each other. by Using the connection of all equipments. WIFI based communications are cheap and provide qualitative. Communication . And we can connect with WIFI module very easily, and get information and also one advantages of WIFI module is we can set password in Android application to monitoring system for EV.

C) C) Smart Battery monitoring system for EV

In this paper, We monitor the different parameters of Battery like temp, Current Voltage, overcharging etc . we can get information of this parameter by using the different types of sensors. After that we transfer this data through WIFI module to the online Android mobile application .In this Application we can easily monitor the real time data and saving data on the storage to analysis purpose of battery .we can perform the task using both auto mode or manually mode .

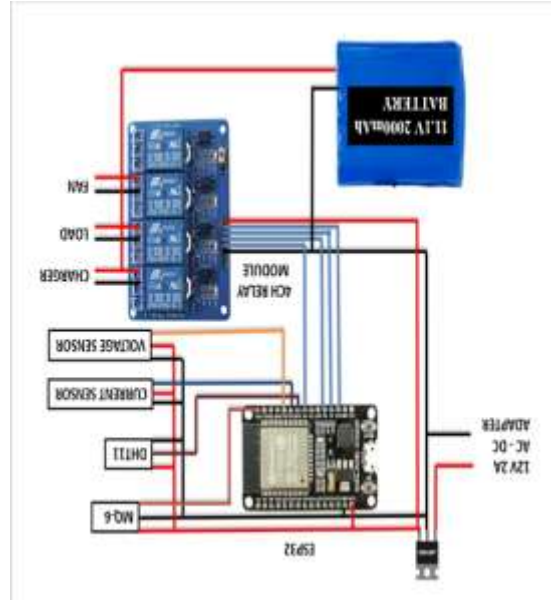
D) BMS battery Management System for BV

In this paper. We are using the BMS system to manage the battery performance. The BMS is the most critical and essential Component in electric vehicles. It provides safety to the EV battery from the faults occurrences in the operations. The Battery is an electrochemical product that's why it is very sensitive to environment and operational condition. The EV Battery are easily affect if any small fault occurs in the operation. So we need to research on this Battery to improve the capacity, efficiency, performance reliability etc.

E) IOT-Based Battery parameters monitoring system for Electric Vehicle

This paper describes the application of Internet-of- things (IOT) in monitoring the performance of an electric vehicle battery. Electric vehicle depends entirely on the energy source from the battery. However, the amount of energy supplied to the vehicle decreases gradually, which leads to performance degradation. This is a major concern for battery manufacturers. In this proposed system, monitoring the performance of the vehicle using IOT techniques is proposed so that the monitoring can be

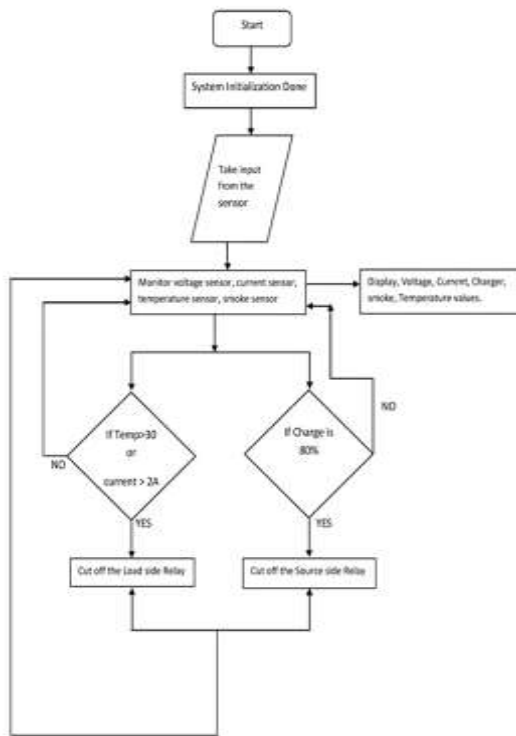
done directly. Based on experimental results, the system can detect degraded battery performance and send notification messages to the user for further action and protect battery by automatic control system.



III. WORKING PRINCIPLE

The system shown in Fig. 1 consists of different sensors, like the current sensor, voltage sensor, and temperature sensor, for monitoring different parameters related to battery conditions in the vehicle. The current sensor monitors the amount of current flow to the load, and the voltage sensor is used to monitor battery voltage in real-time. The voltage sensor can monitor the voltage of up to 13V D.C., and the current sensor can monitor the current of up to 1A. The temperature sensor will monitor the temperature around the battery. The outputs of the current sensor, voltage sensor, and temperature sensor are analogue, and we need to convert that analogue output from the sensor into digital format.

In this paper, the working principle to monitor the parameter of Battery of EV. In this project, are we are monitoring and observing operation. In this operation, all devices are connected with each other. The BMS. controls and manages the activity of Battery and parameters of Battery limit are set at the coding and if the parameter cross the limit, System of protection are rapidly take action on It disconnect the circuit connection and avoid the damages of a circuit.



IV. PROBLEM STATEMENTS.

From the all above available literature, in all existing methods. they have developed IOT based. Battery parameter monitoring system for EV. Even in all existing -methods all equipments are connected with each other but it only monitoring of Parameters are done and controlling of this Operation are not occurs. So, to avoid these things. to control the operation manually as well as automatic we are finding the way which can control the chartings, current, voltage, temp and take action on it and to avoid the damage caused to circuit

V. RESULT AND DISCUSSION

In this paper, we discuss about the smart battery parameter monitoring system for EV. The goal of this project is to monitoring and control the battery Circuit and Parameter of battery and provide protection for the EV.

So. In this project, voltage are Supplied to the Battery for charging, simultaneously. All sensor like voltage sensor, current sensor, fire sensor, temp sensor are monitor the parameters of battery and record the real time data on Android application and also show on the Display. All parameters limit are set on the coding of the system. So that, if any parameter cross the limit sensors detect it and system take action rapidly and disconnects connection and provide protection to the battery circuit.

VI. CONCLUSION

In today's life, rapidly increasing the growth of innovation and updates the technology in all field. So, In Automobile Industry are moved the Hybrid and EV vehicles. day's by day's new EV are updated with new technology. The demand and research are increases and the effect of this we can see the quality and improvement of EV tech. EV vehicles are grow with rapidly and already grab the market cap. This is very ecofriendly for environment. And to remove the disadvantages of Li-ion battery we are finding way to which is already show in this research paper. To improving the safety and quality of EV we are made project module and paper to monitoring the different parameters of battery and provide the protection for EV and pollution free Environment.

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