IOT Based Design and Implementation of Hybrid Electric Vehicle using Control of DC Motor

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Abstract— The main objective of this project is to overcome all the issues in the existing vehicles and for protecting the environment. Due to global economic growth leading to ever changing petrol prices, Privative transport system has become costly affair. One of the most feasible solutions is turning towards renewable energy like solar power instead of fossil fuels. So, electric vehicles should be introduced by integrating and intellectual devices called sensors all over the body of the electrical vehicle with cost effective. More over the speed, range and efficiency of electric vehicles are nearly equal, when compared to diesel and petrol vehicles. The need and importance's of introducing the electric vehicles with IOT based technology which monitors the battery power and solar energy. In addition, the electric vehicles have a battery source which provides good benefits for travelling long distances. In monitoring stage, a new monitoring device which replaces the old technology of GPS (*Global Positioning System****). The same work of GPS has been done by an intelligent device called ESP32S (****Espress if Systems****)***

I. INTRODUCTION

Hybrid electric vehicle is a concept of adopting the dual power source in an Electric vehicle in combined with the classic Internal Combustion Engine. These types of electric vehicles have been evolved in order to increase the system performance when compared to the older one sorption crease the productivity of the hybrid electric vehicle. In the evolution of modern hybrid vehicle adopts many different concepts like regenerative braking concepts,Converting the power from the vehicle cruise mode, power generation and charging the electric vehicle battery from the vehicle kinetic energy etc. In some of the hybrid electric vehicles, the internal combustion engine has transformed to generate power from them in order to charge there chargeable batteries. Based on the different types of techniques adopted from the electric hybrid vehicle the range of electric hybrid vehicles increased tremendously. Also, in now a day due to scarcity of conventional energy resources, all the system is getting converted in to the go green concepts and hence the hybrid electric vehicles are replacing the conventional petrol and diesel vehicles.

II. LITERATURE REVIEW

Design and Implementation of Hybrid Vehicle using Control of DC Electric Motor.This paper presents the design, development and implementation of a hybrid vehicle using both an electric motor and petrol engine to increase efficiency and decrease carbon footprint. Initially, a prototype of a HEV is designed and the performance values are calculated, before a control system is developed and implemented to control the DC motor speed using a microcontroller as the vehicle's electronic control unit along with simple proportional integral derivative (PID) control using speed as a feedback mechanism. The prototype made incorporated voltage, current, speed and torque sensors for feedback resulting in a closed loop control system which successfully matched the speed input of a user-controlled pedal sensor. A user interface was developed to show the driver of the vehicle key variables such as the revolutions per minute (RPM) of the motor, the speed of the vehicle along with the current being drawn, and the voltage applied to the motor with overall power. To output a variable voltage from the Arduino, a digital output was used with pulse width modulation (PWM) capabilities in order to provide a variable DC voltage to the speed controller.

1.1 Resonant Converter L3c For E-Vehicle For Charging A Pv Battery.

Solar radiation and temperature can influence their power and output voltage in electric cars with roof up PV panels (e.g.,Vpv = 24–48 V DC). In such devices, the variable input tension (PV panel), increased with various acquisitions and deposited in high voltage battery packaging, must be separated from the full capacity. In addition, the charger can work in constant stress, steady pressure or steady control modes, based on battery charge status (Vbat = 220–400 V CC), from full discharging conditions up to the floating stress level. The application of the variable PV input voltage and different charging conditions poses insignificant task to control the converter.

III. EXISTINGSYSTEM

The existing system of methodology [1] the voltage, current and the torque is monitored only in the local display which lacks scalability and remote access. Additionally, the system wireless monitoring is implemented with Blue tooth mobile application. Since the system is monitored over Blue tooth terminal, limitation restricted to 10 meters surrounding only and further range of coverage is not possible. Also, sudden raise in load demand is compensated. The battery management strategy to increase the life is not implemented and the overall system is monitor delver serial monitor or virtual terminal window.

IV. PROPOSEDSYSTEM

In the proposed system the solar energy is implemented. The ESP32S microcontroller is used to send the signal to the motor drivers. The microcontroller is connected to the cloud. It transfers the data to the microcontroller to run the system. The entire system is monitored over IoT platform and hence the system doesn't have any range restriction since the system supports scalability.

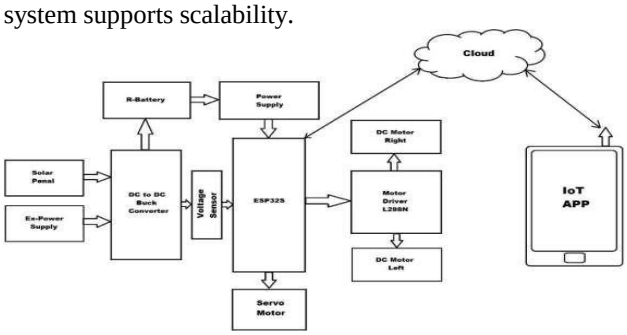

Fig.1. Block Diagram

The above figure represents the system atic block diagram of this project "IoT Based Design and Implementation of Hybrid Electric Vehicle Using Control of Dc Motor". As shown in the figure, the lithium-Ion Battery is used as a power source for Microcontroller operation. Since the power from the lithium-Ion battery is greater than that of the required power supply for microcontroller operation.

V. DESIGNMETHODOLOGY

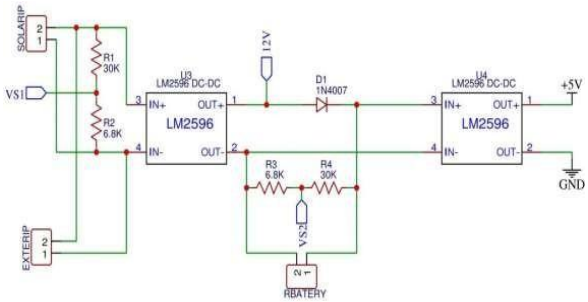

Fig.2.Esp32s Circuit Diagram

The above design describes the entire circuitdiagramofthisproject"IoTBasedDesignandImplementationofHybridElectricVehicleUsingControlofDcMotor".

The Above Design Describes The Entire Circuit Diagram Is Connected To The ESP32S Micro Controller.

VI. RESULTS

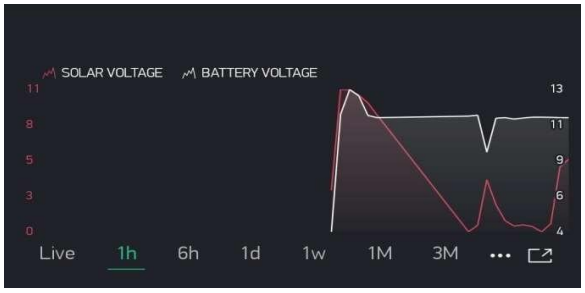

Fig.3. Past 1hr ago

In the Figure 3 the result shows the graph of the solar voltage and the battery voltage for the past 1hour both the solar voltage and battery voltage raises at a time to the peak and the solar voltage decreases gradually and battery voltage maintains constant.

Fig.4. Without Solar Energy

In this Figure 6 the result shows the Solar energy with sun. In this case the solar energy is observed by the solar panel and the voltage drawn from the solar panel is sent to the battery charging and the vehicle is moved by the solar voltage.

CONCLUSION

The progress that the electric vehicle industry has seen in recent years is not only extremely welcomed, but highlynecessary in light of the increasing global greenhouse gas levels. As demonstrated within the economic, social, andenvironmental analysis sections of this webpage, the benefits of electric vehicles far surpass the costs. The biggestobstacle to the widespread adoption of electric-powered transportation is cost related, as gasoline and the vehiclesthat run on it are readily available, convenient, and less costly. As is demonstrated in our timeline, we hope that overthe course of the next decade technological advancements and policy changes will help ease the transition fromtraditional fuel-powered vehicles. Additionally, the realization and success of this industry relies heavily on theglobal population, and it is our hope that through mass marketing and environmental education programs people willfeel incentivized and empowered to drive an electric-powered vehicle. Each person can make a difference, so goelectricandhelp makeadifference!

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