Survey on Charging Station for E-Vehicle using Solar Panel with IOT

Mahadik Tejaswini J., Prof. Shivdas S.S

Department of Electronics Engineering

Karmaveer Bhaurao Patil College Of Engineering, Satara
Dr. Babasaheb Ambedkar Technological University, Lonere.

Abstract: Public charging networks for Electrical Vehicles (EV) is on the rise, with more than 1.3 million EVs deployed worldwide . Whether for economic benefits (higher price per KWh for a faster charging) or for the sole purpose of priority, it has become a point of interest to set a strategy on how to prioritize EVs charging from a single network, especially if the power source is limited as in the case of renewable energy. Our dependence on fossil fuels is drastically reduced by the combined use of solar energy and Electric Vehicle (EV) charging. In this system, a solar charger for electric vehicle is designed and developed. A dc-dc boost converter is employed to boost the solar panel voltage to station battery voltage and Maximum Power Point Tracking (MPPT) is done to optimize the output from solar panel. Provide power from solar panel to the charging station in which the vehicle can be charged through the rechargeable battery and also with the help of IOT , Charging status of the charging station can be monitor at any moment.

Keywords : Iot, Internet Of Things, Solar Panel, Mppt Charger, Renewable Energy, Arduino, E-Vehicle.

I. INTRODUCTION

According to the International Energy Agency (IEA), Renewable will be the fastest-growing source of electricity, in which wind and solar PV are technologically mature and economically affordable. But still there is increase in world's demand for energy. Adopting Renewable Energy technologies is one advance way of reducing the environmental impact. Solar energy is widely available throughout the world and can contribute to minimize the dependence on energy imports.

The Internet of Things (IoT) is a system of related computing devices, mechanical and digital machines, objects, people or animals that are provided with unique identifiers and also the potential to transfer data over a network without requiring human -to-human or human-to-computer interaction. Smart devices, Smart phones, Smart cars, Smart homes, Smart cities. A smart world. "Smart" objects play a key role in the IoT vision, since embedded communication and information technology would have the potential to revolutionize. With the growing presence of WiFi and 4G-LTE wireless Internet access, the evolution toward omnipresent information and communication networks is already evident.

As more countries are moving towards pollution free traffic, E-vehicles are gaining more popularity across the globe. As the number of E-Vehicles increases,E-Vehicle charging infrastructure will be also a basic need. A system with IoT will definitely streamline the performance of E-Vehicle charging and looks the impacts. This method is helpful for transportation systems. This proposed system will improve the city planning and makes the city life easy.

The working costs linked by means of these diesel generators might be incorrectly high due to economical fossil energy costs jointly by means of complexities in petroleum deliverance plus safeguarding of generators. Numerous hybrid systems have been installed across the world, and the expanding renewable energy industry has now developed reliable and cost competitive systems using a variety of technologies.

Using the Internet Of Things Technology for controlling solar photovoltaic energy production can considerably improve the performance, monitoring, and preservation of the plant. With the development of technologies, the price of renewable energy apparatus is going down worldwide attractive huge amount solar photovoltaic fitting. The analysis in this report is foundation on the implementation of a new cost-effective tactic based on iot to distantly observe a solar photovoltaic plant for presentation costing. This will assist in protective preservation, error finding, chronological examination of the plant in calculation to real-time monitoring. With the improvement of wired and wireless network technologies, internet-connected mobile devices such as smartphones and tablets are now in general use.

Thus ensuing in a new theory, the Internet of Things (IoT) was introduced and has received knowledge more than the precedent a small number of years. In common, iot is an data distribution surrounding wherever objects in daily living are related to wired and wireless networks. Recently, it is utilized not just for the field of customer electronics and applications nevertheless moreover in additional different fields such as a smart city, healthcare, smart home, smart car, power system, and industrial safety.

II.   LITERATURE SURVEY

Daug kettles, florad solar energy center, focuse on to accesses the technologies and standards associated with Electric Vehicles (EVs), Electric Vehicle Service Equipment (EVSE) and the related infrastructure. A review of infrastructure, highway and vehicle safety standards and also evaluates the barriers and challenges of deploying an expanded network of EV charging stations and makes recommendations to help standardize and expedite EVSE infrastructure deployment to support the accelerating growth of EVs.

Akila.A, Akila.E, Akila.S, Anu.K, explain the IoT to engage information of charge station availability to the vehicle user through the webpage. The webpage is designed using normal HTML method for the clear and easy usage of information provided. The webpage may consider the graph of battery voltage and time and also the location tracked for charging station as similar to the Google map. The information such as the capacity of battery voltage, time of charging, related location is updated regularly.

Arunkumar.P, Vijith.K, focuses on the IoT part of determining the SoC value and sending the data to Adafruit IO. The user can view the data in the App. Also, the user can locate the nearby charging station locations using the app. Once the user knows about the status of his car battery, he can easily decide whether to proceed with power delivering to the grid or to take power from the grid based on the tariff rates. The tariff rate will be different for delivering power to the grid and taking power from the grid.

III.   BLOCK DIAGRAM

In this figure, there are various units are used. This are Arduino UNO R3, power suppy, solar panel , WIFI module, current sensor, voltage sensor, two batteries, relay drivers, LCD display, MPPT charger, Android application.
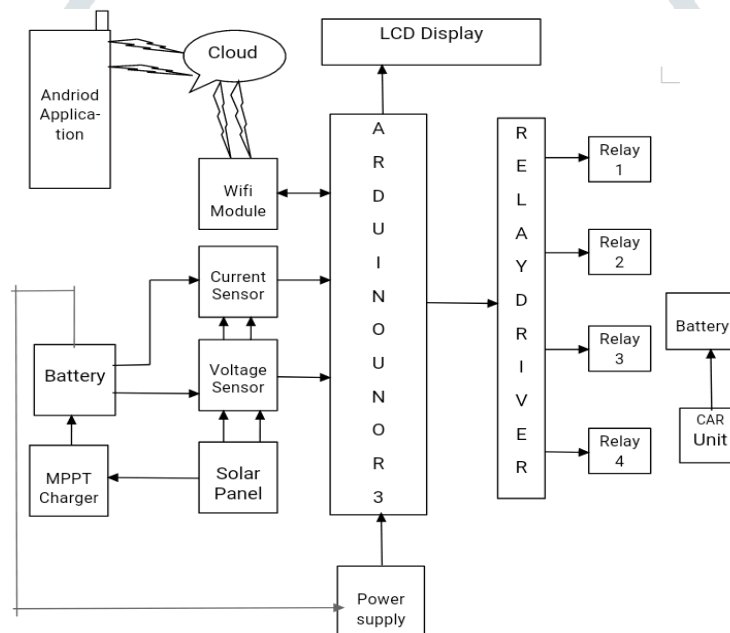
Fig.1.Block Diagram of the Proposed System

1. Charging E-vehicle module using the Solar panel, the maximum power generated by the solar is being tracked using the MPPT controller.
2. The whole setup is connected to the Arduino UNO R3, the battery level, generated and distributes an amount of the battery is viewed using an LCD.
3. A web page is used to check the status of charge of main station battery and the vehicle battery, the amount of power transferred to the main battery by the solar panel and the vehicle battery is charged through the main battery. The charging status of main battery and vehicle battery display on the LCD display. charging module and the available location for the charging station can be displayed.
4. Charging station status is stored in the thingspeak and access by android application. The main idea of this system is to reduce greenhouse gas emission and fossil fuel.

IV.   CONCLUSION

Internet of Things (IoT) based battery sensor monitors the status of the battery as an energy storage management system. The IoT developed here uses a cloud platform for management purpose. The vehicle user can easily check to the destination to reach the charging station and can view the withdrawal of battery voltage from the system. The data stored in the Arduino can withstand until battery fails to charge. For the future use, multiple user for the e-vehicle who settles the station are stored and upgraded in the database so that the distribution to the different user can be monitored. The upcoming year will come more and more solar electric vehicle due to these reasons :

Reduction of emission of fossil fuel for extracting power from renewable resources. Intelligent compliance to electronic requirements that facilitate the monitoring the availability of used power using IOT. Tracking of sun's radiation throughout a time. Electric vehicle confines the outlook of passenger a vehicle that draws current from the rechargeable battery.

V.   ACKNOWLEDGEMENT

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