IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, June 2022
Impact Factor: 6.252

IOT Based Solar Charging Station for E-Vehicles

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Abstract: *This project is about charging E-vehicle module using the Solar panel, availability of maximum power is viewed by IOT device and the maximum power generated by the solar is being tracked. The project is designed using hardware and software. The whole setup is connected to the Arduino; the battery level is viewed using an LCD. GSM modem is used to get an alert message for any reduction of power occurred in the system. A web page is used to check the availability status of charge can be displayed. The main idea of this paper is to reduce greenhouse gas emission and fossil fuel.*

Keywords: E-vehicles, Charging Station, Remote accessing of data

I. INTRODUCTION

The demand for conventional energy like coal, natural gas, and oil is raised, so that the researchers forced towards the development of renewable resources or non-conventional energy resources. In the last couple of years, there has been a lot of discussion around the prices of fuel apart from the deregulation of petrol and fossil fuel prices. In 1800s electric vehicle had led on the road. The main objective of the project is to provide power from solar PV cell to the charging station in which the vehicle can be charged through the rechargeable battery and also with the help of IOT, the availability status of the charging station can be monitored frequently at any moment.

II. LITERATURE SURVEY

In January 2007 presentation titled as "Modelling and control of a grid connected photovoltaic system "This presents a simulation model of the electric part of a grid connected photovoltaic generator. The model contains a detailed representation of the main components of the system that are the solar array, boost converter and the grid side inverter. A proper control of the DC/DC converter is developed in order to extract the maximum amount of from the photovoltaic generator.

In March 2013 presentation titled as "MODELING AND CONTROL OF GRID CONNECTED PHOTOVOLTAIC SYSTEM: A REVIEW" The sale of electric energy generated by photovoltaic plants has attracted much attention in recent years. The installation of PV plants aims to obtain the maximum benefit of captured solar energy. The different techniques of modeling and control of grid connected photovoltaic system with objective to help intensive penetration of photovoltaic (PV) production into the grid have been proposed The current methodologies for planning the design of the different components of a PV plant are not completely efficient.

III. PROBLEM STATEMENT

At present problem of interruption and security issues has increased in this creating world. There are a couple of observing charging stations, for instance, charging at some bunks etc. Regardless, today paying little heed to where the client is voyaging we can even now discover more explorers on their own vehicles with the current innovation technology (fuel). A force charging system is critical in different fields of our condition, for instance, an hourly instalment for charging, power-based instalments, etc. The vast majority of the charging stations frameworks are over the top expensive for working class gatherings to set up such Kind of structure. The normal gatherings are using IOT based insignificant expense charging structures which will help them with making sure about their instalment and qualifications of their advantage.

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IV. PROPOSED SYSTEM

The project we are using LDR sensors, Solar Panel, 12V Battery. The Solar panel will rotate based on the values of LDR which is interfaced with Servo Motor. The battery voltage and the panel voltage will be displayed on LCD and is sent to cloud server.

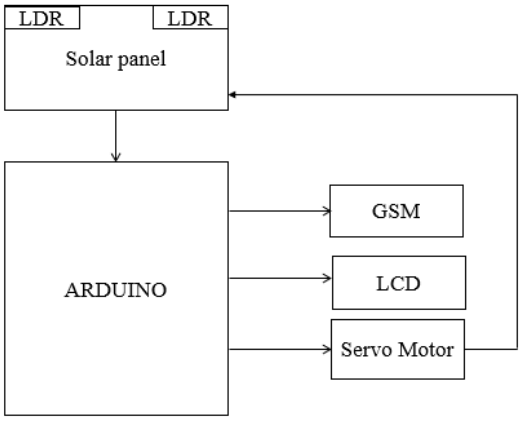
V. METHODOLOGY

In existing we don't have any wireless power transformation techniques. Instead we are using wired power transmission which cannot be found everywhere. So here we are implementing Wireless Power transmission.

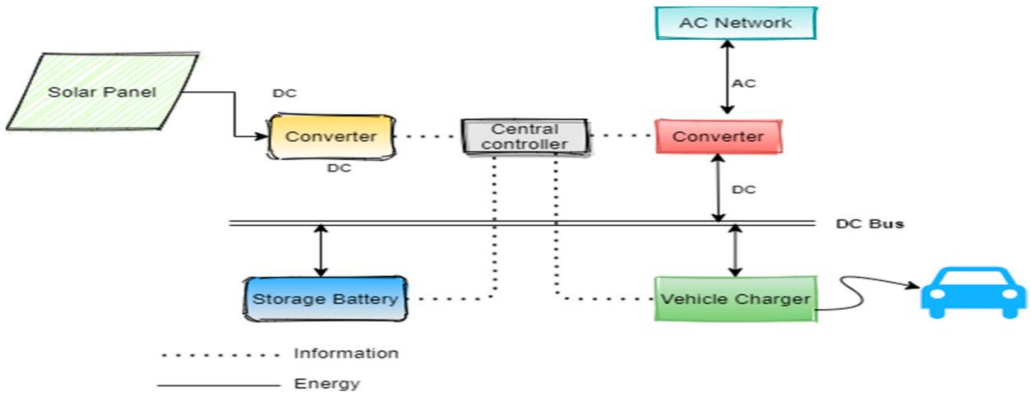
VI. DESIGN OF PROPOSED SYSTEM

As a solar PV array plays a vital role in a project, the model simply uses torches with LDR sensor to track the position for generating power from the source which helps the continuous flow of energy. Since the tilting angle of the sun varies from 0 o to 180º, two sensors should be built for either direction i.e., one in the left and other in the right. Then, the collected electric source from the PV cell is transferred to 12V battery.

The regulated constant voltage is delivered to an analog input of Arduino to avoid the complexity of the operation. The meter should help to monitor the constant voltage. Arduino is a microcontroller board with 20 digital input and six can be used as an analog input. Program for tracking, delivering and displaying the required power output supply.



VII. FLOW CHART



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VIII. RESULT

IX. CONCLUSION

Modelling of grid connected converters for solar energy requires not only power electronics technology, but also detailed modelling of the grid synchronization and modulation techniques. Solar tracking mechanisms improve the energy gain of solar power plants. A single-axis tracking system is generally the one that reaches the highest energy gain in every region. It is therefore the most versatile system, since it can be installed anywhere, guaranteeing a high energy gain. Solar trackers are recommended everywhere from an energetic point of view, since they always increase the amount of collected energy. The use of LDR sensors and current sensors guarantees a more accurate and efficient tracking system. We can know the current readings of the battery it in LCD display.

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